SCREENING FOR RISK OF SUBSTANCE USE: VALIDATING THE
ADOLESCENT DOMAIN SCREENING INVENTORY AMONG
A SAMPLE OF JUVENILE OFFENDERS

by

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ABSTRACT

Juvenile offenders are especially at-risk for developing a substance use disorder due to the strong association between delinquent behavior and alcohol and other drug use. Various forms of assessment are employed by substance abuse treatment agencies, hospitals and youth centers to identify youth who are in need of substance use treatment or other preventive interventions. The ADSI is a screening instrument that was designed to identify adolescents who are at-risk for developing a substance use disorder while considering the underlying risk and protective factors associated with substance use and other problem behavior. The present study assessed the validity of the ADSI among a sample of 121 juvenile offenders. Results from a confirmatory factor analysis provided support for the four-factor structure originally proposed by Corrigan and colleagues consisting of Individual/Peer, School, Family, and Community domains. Results provided also provided evidence of content, predictive and convergent validity. Overall, evidence provided support for the validity and utility of the ADSI in juvenile justice settings with the caveat that further research should be conducted on the ADSI prior to implementing this screening instrument.
# TABLE OF CONTENTS

ABSTRACT ........................................................................................................................................ iii

LIST OF TABLES ........................................................................................................................ vi

LIST OF FIGURES ................................................................................................................... vii

1. INTRODUCTION AND LITERATURE REVIEW ........................................................................ 1

   Background and Significance .................................................................................................... 1
   Adolescent Substance Use in the United States ....................................................................... 4
   Juvenile Offenders in the United States ................................................................................... 8
   Juvenile Offenders and Substance Use ................................................................................... 10
   Social Development Model .................................................................................................... 14
   Assessing Adolescents for Substance Use Disorders ............................................................. 27
   Overview of Screening Instruments ....................................................................................... 34
   Adolescent Domain Screening Inventory ............................................................................... 44
   Statement of the Problem ....................................................................................................... 49
   Purpose of the Study ............................................................................................................... 49
   Research Questions ............................................................................................................... 50
   Summary .................................................................................................................................... 50

2. METHODOLOGY ....................................................................................................................... 52

   Population and Sample ......................................................................................................... 52
   Juvenile Offenders in Utah and Substance Use ..................................................................... 55
   Measures .................................................................................................................................. 60
   Procedure ............................................................................................................................... 66
   Participant Demographics .................................................................................................... 68
   Analytical Plan ....................................................................................................................... 73

2. RESULTS .................................................................................................................................. 81

   Data Inspection and Cleaning ............................................................................................... 82
   Research Question 1: Testing Model Fit of the ADSI .............................................................. 83
   Research Question 2: ADSI Domains and Substance Use Severity ....................................... 95
   Research Question 3: Convergent Validity of the ADSI ......................................................... 98

4. DISCUSSION ........................................................................................................................... 102
<table>
<thead>
<tr>
<th>Table</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Substance Abuse Screening Instruments for Adolescents</td>
<td>36</td>
</tr>
<tr>
<td>2.</td>
<td>Use of Observation and Assessment Facilities During Fiscal Year 2008</td>
<td>59</td>
</tr>
<tr>
<td>3.</td>
<td>Percentage of Lifetime Alcohol and Drug Use Among Participants</td>
<td>70</td>
</tr>
<tr>
<td>4.</td>
<td>Percentage of 30-Day Alcohol and Drug Use Among Participants</td>
<td>72</td>
</tr>
<tr>
<td>5.</td>
<td>First Confirmatory Factor Analysis of the ADSI</td>
<td>83</td>
</tr>
<tr>
<td>6.</td>
<td>List of Items Within Each Item Parcel</td>
<td>87</td>
</tr>
<tr>
<td>7.</td>
<td>Descriptive Statistics for Item Parcels</td>
<td>89</td>
</tr>
<tr>
<td>8.</td>
<td>Second Confirmatory Factor Analysis of the ADSI with Item Parcels</td>
<td>90</td>
</tr>
<tr>
<td>9.</td>
<td>Interdomain Correlation Matrix (N = 118)</td>
<td>93</td>
</tr>
<tr>
<td>10.</td>
<td>Standardized Regression Weights for the Second CFA Model</td>
<td>94</td>
</tr>
<tr>
<td>11.</td>
<td>Stepwise Regression Model Summary</td>
<td>96</td>
</tr>
<tr>
<td>12.</td>
<td>Stepwise Regression: Coefficients for Final Model</td>
<td>96</td>
</tr>
<tr>
<td>13.</td>
<td>Regression Model Summary for All ADSI Domains</td>
<td>97</td>
</tr>
<tr>
<td>14.</td>
<td>Coefficients for Final Model for All ADSI Domains</td>
<td>98</td>
</tr>
<tr>
<td>15.</td>
<td>Intercorrelations Between Antisocial Behavioral Scale, ADSI and Demographic Variables</td>
<td>101</td>
</tr>
<tr>
<td>Figure</td>
<td>Page</td>
<td></td>
</tr>
<tr>
<td>-----------------------------------------------------------------------</td>
<td>--------</td>
<td></td>
</tr>
<tr>
<td>1. The Social Development Model of Antisocial Behavior - General Model</td>
<td>22</td>
<td></td>
</tr>
<tr>
<td>2. The Social Development Model of Antisocial Behavior - High School</td>
<td>26</td>
<td></td>
</tr>
<tr>
<td>Period</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Mean Age of Onset for Substance Use and Arrest</td>
<td>69</td>
<td></td>
</tr>
<tr>
<td>4. Model Output for the First Confirmatory Factor Analysis of the ADSI</td>
<td>84</td>
<td></td>
</tr>
<tr>
<td>5. Model Output for the Second Confirmatory Factor Analysis of the ADSI</td>
<td>91</td>
<td></td>
</tr>
</tbody>
</table>
CHAPTER 1

INTRODUCTION AND LITERATURE REVIEW

Background and Significance

Experimentation with substance use is common among adolescents. Results indicate that by the time youth graduate from high school, many have consumed alcohol, been intoxicated or even tried an illicit drug such as marijuana (Johnston, O’Malley, Bachman, & Schulenberg, 2011). The majority of adolescents who experiment with substances will not experience problems with alcohol or other drug use in young adulthood; however, a small percentage of youth will develop substance abuse or dependence disorders without proper intervention or substance abuse treatment (SAMHSA, 2006). Empirical evidence indicates that in particular, juvenile offenders are at high risk for developing substance abuse issues due to the strong association between juvenile delinquency and alcohol or other drug use (Loeber, Stouthamer-Lober, & White, 1999; Stice, Myers, & Brown, 1998; Stoiber & Good, 1998).

The combination of deviant behavior and substance use is especially problematic for adolescents, and at times, even deadly (Wilson, Rojas, Haapanen, Duxbury, & Steiner, 2001). In general, juvenile offenses can be exacerbated by substance abuse - from thefts to provide funds for substances, arrests for possession and distribution, and drug-related crimes, to impulsive violence, including assault or even murder (Wilson,
Rojas, Haapanen, Duxbury, & Steiner, 2001). Further, previous research indicates that alcohol and other drug use influences deviant behavior in early and late adolescence, and also throughout young adulthood (Brook, Whiteman, Finch, & Cohen, 1996). This fact could possibly explain why substance use is strongly associated with recidivism among juvenile offenders and is a robust predictor of prior incarcerations (Benda, Corwyn, & Toombs, 2001; Myner, Santman, Cappelletty, & Perlmutter, 1998; Stoolmiller & Blechman, 2005). Besides criminal activity, early initiation of drug use is also correlated with other problem behaviors such as risky sexual behavior, driving while under the influence of alcohol or other substances, truancy, and expulsion from school (World Health Organization, 2004).

To curtail the development of such problems, juvenile justice services require first-time offenders as well as young offenders with multiple arrests to complete extensive assessment as a way to measure their social, behavioral, physical, and psychological functioning (Snyder & Sickmund, 2006). The information gathered from the tests assists in providing recommendations for mental health treatment and other forms of programming. There are a variety of assessment instruments used with adolescents to measure risk for substance abuse and delinquency (Winters, 2003). Some of these instruments screen for risk of certain problem behaviors, while other measures are comprehensive and obtain detailed information about a variety of issues. In particular, screening instruments are valuable tools for juvenile justice personnel because they dictate whether a juvenile offender needs to receive further, more comprehensive assessment (Winters, 2003). Information obtained from screening tests assists juvenile justice personnel in making short-term recommendations for mental health treatment or
involvement in other programming while a comprehensive assessment is being conducted. Screening measures are also a cost-effective mode of assessment.

Despite the benefits of screening instruments, many of the current measures available to assess for risk of substance use disorders among adolescents, including juvenile offenders, provide limited information. For instance, the majority of results from screening measures are presented in a dichotomized fashion, where adolescents are either at low or high risk of developing a substance use disorder or they are deemed to be a “green flag” or “red flag” in terms of needing further assessment (Winters, 1992).

Although this broad information is useful, it does not address the underlying factors that are likely causing the adolescent to participate in such problematic behavior. In order to address this issue, Corrigan and colleagues (2007) developed and evaluated a new screening measure, the Adolescent Domain Screening Inventory (ADSI), to identify the risk areas of adolescents who are experimenting with, or frequently using, alcohol and other drugs.

The ADSI is a 33-item self-report screening instrument that assesses for risk and protective factors among adolescents (Corrigan, 2009). More specifically, the ADSI evaluates risk and protective factors in individual and peer, family, school, and community domains. The ADSI was developed and initially validated using archival data (Corrigan, Loneck, & Videka, 2007). Although results indicated strong support for the utility of this measure, it has yet to be validated with a sample of adolescents using prospective data collection. Because the ADSI was designed to evaluate adolescents who are assumed to be experiencing with, or frequently using, alcohol and other drugs, it would be important to evaluate the validity and utility of this measure with youth who are
deemed to be at risk for substance use. Due to the strong association between juvenile offenders and alcohol and other drug use, the purpose of this study was to validate the ADSI among a sample of juvenile offenders. Results from this study contribute to the current literature on screening for substance use disorders and other problem behavior in adolescents, and more specifically, juvenile offenders. Following is a review of the literature to provide more information on the nature of adolescent substance use in the United States, the association between juvenile crime and substance use, the conceptual underpinnings of this association, an overview of the instruments utilized to measure adolescent substance use disorder, and the development of the ADSI.

**Adolescent Substance Use in the United States**

Adolescence is a period of transition involving physical, mental, and social changes (Coleman & Hendry, 1990; Feldman & Elliott, 1990; Rutter & Rutter, 1993). This life stage is also defined by experimentation where adolescents experiment with adult-like activities and behaviors as a means to fulfill developmental needs and explore their identity (Blakemore & Choudhury, 2006; Kelly, 2007). The majority of adolescents also sample alcohol and other drugs during this time (Johnston, et al., 2011). Youth participate in substance use behavior for a variety of reasons, including to comply with peer pressure, to appear more adult-like or mature, to manage feelings of anxiety or depression, or to evoke excitement and entertainment (Kaminer & Tarter, 2004). Experimenting with alcohol and other drugs, although illegal, can be viewed as a normative part of adolescence and not entirely deviant or problematic (Kaminer & Tarter, 2004). For instance, in a study examining the impact of substance use on adolescent development, participants who experimented with alcohol or other drugs had better
psychological outcomes than those who used substances regularly or those who abstained from alcohol or other drugs throughout adolescence (Shedler & Block, 1990). Additionally, most adolescents who experiment with alcohol and other drugs do not develop substance use disorders as defined by the Diagnostic and Statistical Manual (DSM-IV-TR; American Psychological Association, 2001; SAMHSA, 2006).

National data on adolescent substance use in the United States are collected every year in order to better understand, prevent, and treat substance abuse issues among youth. For example, one of the annual questionnaires used to gather this information is the Monitoring the Future Study survey (Johnston, et al., 2011). Since 1975, a nationally representative sample of tenth and twelfth grade students have completed the Monitoring the Future Study survey by responding to questions about their lifetime, annual, 30-day, and daily substance use behavior, which includes alcohol and specific drug use, as well as their perceptions of using alcohol and other drugs. Johnston and colleagues (2011) also began including eighth grade students in their sample in 1991. In the most recent data collection in 2010, approximately 47,000 eighth, tenth and twelfth grade students attending 400 public and private secondary schools in the United States completed this survey (Johnston, et al., 2011).

**Lifetime Substance Use**

According to the lifetime substance use results of the most recent Monitoring the Future Study survey (Johnston, et al., 2011), approximately 70% of 12th graders reported trying alcohol and 51% admitted they have been intoxicated on at least one occasion prior to high school graduation. Also, approximately 45% of 12th graders reported smoking marijuana, 40% have smoked cigarettes and 25% stated they had tried an illicit drug other
than marijuana at least once in their lifetime. Lifetime substance use percentages were less for 10th graders with approximately 56% of 10th graders admittingly consuming alcohol at least once, 36% reported being intoxicated on at least one occasion, 35% having smoked marijuana, 30% having smoked cigarettes, and 15% reporting having used another illicit drug other than marijuana at least once (Johnston, et al., 2011). As expected, lifetime substance use percentages for eighth grade students were less than both 10th and 12th graders. Approximately 33% of eighth graders reported trying alcohol, 15% had been intoxicated on at least one occasion, 20% stated they had smoked cigarettes, 16% admitted to smoking marijuana, and 10% reported trying an illicit drug other than marijuana at least once (Johnston, et al., 2011). It should be noted that lifetime prevalence of marijuana use has increased 4% among 12th graders and 3% among 10th graders since 2007 (Johnston, et al., 2011). Despite the gradual rise in marijuana use among adolescents, overall lifetime substance use statistics among youth have significantly decreased since the early 1990s, implying that prevention and treatment efforts have had some influence on adolescents in the United States (Johnston, et al., 2011). However, there are subgroups of adolescents who continue to exhibit problematic substance use by using drugs and alcohol on a consistent basis. This information is highlighted through 30-day use percentages.

30-Day Substance Use

Results for 30-day substance use from the most recent Monitoring the Future Study indicate that approximately 40% of 12th graders reported consuming alcohol at least once in the past 30 days, 25% stated they had been intoxicated, 23% admitted smoking marijuana, 20% stated they had smoked cigarettes, and 9% reported trying an
illicit drug other than marijuana (Johnston, et al., 2011). For 10th graders, approximately 27% reported trying alcohol at least once, 14% stated they had been intoxicated, 12% stated they had smoked cigarettes, 18% admitted to smoking marijuana, and 5% reported using an illicit drug other than marijuana in the past 30 days (Johnston, et al., 2011). Among eighth graders, 13% reported consuming alcohol at least once in the past 30 days, 4% stated they had been intoxicated at least once, 6% noted smoking cigarettes, 7% admitted to smoking marijuana, and 3% reported trying an illicit drug other than marijuana in the past 30 days (Johnston, et al., 2011). It should be noted that the prevalence rate for marijuana use in the past 30 days increased 4% among 12th graders, 3% among 10th graders and 2% among eighth graders since 2007 (Johnston, et al., 2011).

Also, for the purpose of this study, it is important to highlight the prevalence of concurrent substance use among adolescents. Concurrent substance use is defined as using more than one substance (e.g., alcohol and marijuana) at a time, either simultaneously or within a certain time period, which is usually determined by the questionnaire being administered to measure substance use (SAMHSA, 2009). As the results from the Monitoring the Future Survey indicate, a proportion of adolescents appear to use substances concurrently or use more than one, but not necessarily at the same time (Johnston, et al., 2011). The Monitoring the Future Survey does not ask participants specifically about their concurrent substance use; however, another national survey project does. The National Survey on Drug Use and Health is an annual nationwide survey involving interviews with approximately 70,000 randomly selected individuals aged 12 and older (SAMHSA, 2009). In the most recent results on concurrent illicit drug use with alcohol use (e.g., during or within 2 hours of last alcohol use),
approximately 14% of youth between ages 12 to 17 endorsed concurrent substance use within the past 30 days (SAMHSA, 2009). They indicated typically drinking alcohol in conjunction with smoking marijuana. In addition, adolescents and young adults between the ages of 18 to 25 had higher rates of illicit drug use concurrent with last alcohol use than individuals in older age groups (SAMHSA, 2009).

These data indicate that a small but significant portion of adolescents abuse alcohol and other drugs. In actuality, approximately 10% of adolescents will go on to develop some form of a substance use disorder in adulthood, which can be severely detrimental to their health and welfare (SAMHSA, 2006). Irresponsible and regular substance use is associated with poor grades, truancy, driving while under the influence of alcohol or other drugs, fighting, risky sexual behavior, and serious criminal offenses (World Health Organization, 2004). Further, adolescents who develop substance use habits and commit crimes not only become a risk to themselves but also to others, as criminal offenses are often exacerbated by substance abuse (Wilson, et al., 2001). It is therefore, important to understand the complex association between adolescent substance use and juvenile delinquency.

**Juvenile Offenders in the United States**

The population of juvenile offenders in custody in the United States remains high even though the number of juvenile offenders residing in government facilities decreased by 19% from 2007 to 2010 (Sickmund, Sladky, Kang, & Puzzanchera, 2011). In a one-day count conducted in October of 2010, the Office of Juvenile Justice and Delinquency Prevention (OJJDP) reported that 70,792 juvenile offenders were in custody in the United States, and that these youth resided in either public or private residential facilities
The majority of juvenile offenders in residential placement facilities in 2010 were male (87%) and between 16- and 17-years-old (56%; Sickmund, et al., 2011). The number of minority youth in custody was disproportionate to the population of minority individuals in the United States (Sickmund, et al., 2011). Caucasian youth comprised only 32% of the juvenile offenders in custody, while the remaining 68% were minority youth. African American youth accounted for 41% of juvenile offenders in residential placement, and Latino youth accounted for 22% of all youth in custody.

In 2010, the majority (96%) of juvenile offenders were placed in custody for committing delinquent offenses (Sickmund, et al., 2011). These types of offenses are behaviors that would be deemed criminal law violations for adults. Approximately 37% of the offenses committed by juvenile offenders in custody in 2010 were against people, 24% were against property, 7% were drug offenses (e.g., selling or using drugs), and 11% were public order offenses. The remaining 4% of juvenile offenders in custody committed status offenses, or behaviors that are not law violations for adults, such as truancy and running away from home (Sickmund, et al., 2011). It should be noted that even though there is a strong association between juvenile delinquency and substance use (Dawkins, 1997; Helstrom, Bryan, Hutchingson, Riggs, & Blechman, 2004; Loeber, et al., 1999; Prinz & Kerns, 2003; Roget, Fisher, & Johnson, 1998; Stice, et al., 1998; Stoiber & Good, 1998), no data were collected on whether or not these youth were under the influence of alcohol or other drugs when committing these offenses. The correlation between substance abuse and juvenile offenders is discussed in detail in the next section.
Juvenile Offenders and Substance Use

Incarcerated youth report higher use and earlier use of alcohol, tobacco, and other drugs than their nonincarcerated peers (Wilson, et al., 2001). For example, in a cross-sectional study with 189 male and female adolescents in secure-care facilities, Prinz and Kerns (2003) reported that a large percentage of both male and female participants began using alcohol and cigarettes when they were approximately 10 years old. In addition, by the time participants were 13 years old, 32% of males and 39% of females consumed alcohol at least several times per month, 24% of males and 30% of females used marijuana at least 1 to 2 times per month, and 28% of males and 10% of females smoked cigarettes at least 1 to 6 times per week. In summary, by the time participants were 13 years old, 79% of these youth had initiated the use of at least one illicit substance.

Another study documenting alcohol and other drug use in juvenile offenders reported that 94% of participants had used marijuana, 91% had consumed alcohol, 58% had used hallucinogens, and 41% had used cocaine (Jenson, Potter, & Howard, 2001). Most of the youth in this study began using alcohol and marijuana when they were 12 years old.

Substance Use and Type of Crime

Not only is there a positive correlation between substance use and juvenile offending, but there is also an association between the type of substance used and the crimes adolescents commit. For instance, youth who sell or use drugs are more likely to participate in property and person crimes (OJJDP, 2000). Dawkins (1997) conducted a study to evaluate the relationship between juvenile substance use and violent versus nonviolent crime. Approximately 300 juvenile offenders from a residential facility completed questionnaires regarding their offense and substance use histories. Overall,
results indicated that substance use was associated with both violent and nonviolent offenses. Alcohol use had the strongest association for substance use and criminal offenses, and alcohol use was more related to violent and significant offenses as opposed to marijuana and heroin. These offenses included serious fights, injury to a victim, problems with parents, extortion, vandalism, and hitting. Use of marijuana was reported to be a predictor of store theft, general trouble with police, theft over 50 dollars, gang fights, use of a weapon in crimes, and petty theft from vehicles.

**Substance Use and Recidivism**

Previous substance use is also a significant predictor of continued delinquency and recidivism. In 1997, Akers reported that the two strongest predictors of delinquency and recidivism were peer association and drug use. Myner, Santman, Cappelletty, and Perlmutter (1998) analyzed the probation and mental health files of 138 male juvenile offenders to determine the possible predictors of recidivism. Variables were based on the demographic, behavioral, familial, school-related and crime-related information provided in these reports. Results indicated that 43% of the participants had abused alcohol and 45% of the participants had abused drugs before being adjudicated. Also, alcohol abuse was found to be one of the primary predictors of recidivism.

Similar results were found in a longitudinal study conducted by Benda, Corwyn, and Toombs (2001). Two hundred forty-eight incarcerated male and female juvenile offenders completed baseline surveys and follow-up surveys 2 years later. The 2-year recidivism rate was approximately 54%, and two of the main predictors of recidivism were age of onset of using illicit drugs and a previous diagnosis of substance abuse. In a more recent study, Stoolmiller and Blechman (2005) surveyed 505 juvenile offenders and
their parents on social competence and behavioral problems. Substance abuse was found to robustly predict recidivism regardless of prior delinquency, gender, ethnicity, age, follow-up time, or data source.

As suggested above, the relationship between substance use and juvenile delinquency tends to begin in early adolescence and as recidivism occurs, this association remains stable over the adolescent years and continues on into young adulthood (Brook, Whiteman, Finch, & Cohen, 1996). It is apparent that this problematic relationship creates immediate challenges and difficulties for adolescents in this situation, but the aftermath of this substance use-and-crime association often follows these youth throughout the rest of their lives. For instance, adolescents who use illegal drugs (marijuana, heroin, cocaine, etc.) on at least two or more occasions within a 6-month period are at a higher risk for antisocial behavior and substance abuse (Van Kammen & Loeber, 1994). This finding is supported by a study conducted by Ellickson, Tucker, and Klein (2001), where results suggested that seventh-grade students who smoked tobacco three or more times during a 1-year period were more likely to regularly use tobacco and hard drugs, sell drugs, drop out of school, have health problems, and experience early pregnancy. It is thus, of grave concern when youth become caught in the repetitive cycle of recidivism, which in turn perpetuates problems with developing delinquent behavior and tendencies as well as increasing substance abuse problems and severity of crime committed (Mulder, Brand, Bullens, & Van Marle, 2010, 2011).

Possible Causes of Delinquent Behavior

Even though the association between substance use and juvenile delinquency has been established, the specific causes and reasons for this relationship have not been fully
determined, likely because developing delinquent behavior is a dynamic and complex process involving multiple factors (Catalano & Hawkins, 1996). Many previous research studies have focused on measuring how a specific risk factor (e.g., peer relationships) contributes to the development of delinquent behavior. For instance, Welch-Brewer and colleagues (2011) assessed how race, substance abuse and mental health disorders were predictors of juvenile court outcomes, such as number of court offenses, felony convictions, probation supervision length, detention length and number of probation services among 341 delinquent youth. Results indicated race was a significant predictor for males. In addition, having a substance use disorder was a stronger predictor of delinquency outcomes for males, whereas having a mental health disorder was a stronger predictor of delinquency outcomes for females. Conduct disorder and early childhood aggression are also suggested to be a predictor of both substance use and juvenile delinquency (Helstrom, et al., 2004). Results from a study assessing the relationship between substance use and juvenile delinquency suggested that childhood aggression was related to both substance use and delinquency, that substance use led to crime and delinquency, and that aberrant behavior increased the probability of later drug use (Brook, et al., 1996).

Another possible cause for the relationship between substance use and delinquency is that juvenile offenders report high occurrences of both externalizing (e.g., attention deficit hyperactivity disorder) and internalizing problems (e.g., depression, anxiety, and withdrawn behavior), which are often associated with delinquency and substance use (Wilson, et al., 2001). In a study conducted by Loeber et al. (1999), results indicated there was a positive correlation between substance use and delinquency, but
also a positive correlation between substance use and internalizing behavior. Findings also suggested that substance use was predicted by persistent delinquency and persistent internalizing behavior for youth in the early and middle stages of adolescence, but persistent substance use was only predicted by persistent delinquency for participants who were in the older stages of adolescence (Loeber, et al., 1999). Similarly, Stice and colleagues (1998) reported that delinquency moderated between the level of substance use and later problem use.

In an effort to explain how multiple risk factors contribute to delinquent behavior, Bender (2010) composed a review article with the thesis that experiencing maltreatment during childhood is an established risk factor for delinquency in adolescence. In her explanation, she included a diagram with pathways elucidating how through a complex process, risk factors such as substance abuse, mental health problems, school difficulties, negative peer networks, running away from home, and gender, in conjunction with childhood maltreatment, can lead to subsequent delinquent behavior. Bender (2010) is not the first individual to explain the etiology of delinquent behavior by developing a model of pathways and risk factors. Other models have been generated in the past, including the Social Development Model (Catalano & Hawkins, 1996), which is further described below.

**Social Development Model**

The Social Development Model (SDM) utilizes empirical research on delinquency, crime and substance abuse to explain the etiology and maintenance of prosocial and antisocial behavior among adolescents (Catalano & Hawkins, 1996). It should be noted that within the SDM, the term “antisocial” describes a delinquent or
The Social Learning Theory (SLT) asserts that human behavior is a result of the continuous reciprocal interaction between cognitive, behavioral, and environmental influences (Bandura, 1977). More specifically, patterns of behavior, whether prosocial or antisocial, are learned from observing others such as family members, peers, teachers, and other influential individuals within a community (Bandura, 1977; Dembo, Farrow, Schmeidler, & Burgos, 1979). Four primary constructs are involved in establishing a learned behavior: 1) perceived opportunities for participating in an activity or interaction with others, 2) degree of involvement in the activity or interaction, 3) skills for continued involvement in the activity or interaction, and 4) perceived rewards or reinforcement for maintaining involvement in the activity or interaction (Catalano & Hawkins, 1996). These four constructs are directly and indirectly influenced by three exogenous, or external, factors.

The first exogenous factor is position in the social structure, which includes socioeconomic status, age, gender, and race or ethnicity (Catalano & Hawkins, 1996). This exogenous factor indirectly affects perceived opportunities for involvement in
activities and interactions with others (Catalano & Hawkins, 1996). For instance, a girl may not perceive the opportunity to play football during her childhood because of the societal constraints associated with gender and this particular sport. The second exogenous factor is comprised of the individual traits and characteristics that allow a person to participate in a specific activity or interaction, or conversely, prevent him or her from doing so (Catalano & Hawkins, 1996). Constitutional and physiological factors, such as cognitive ability and motor functioning, directly influence perceived opportunities for participating in an activity or interaction (Catalano & Hawkins, 1996). For instance, inability to interpret facial expressions would likely prohibit a person from perceiving many opportunities to engage in a social interaction. Constitutional and physiological factors also directly affect the skills needed for participation in an activity or interaction, which in turn, influences perception of the rewards associated with the activity or interaction (Catalano & Hawkins, 1996). For example, a student with Attention-Deficit/Hyperactivity Disorder may not have the skills required to participate in quiet classroom activities, such as reading time, and as a result may perceive these types of activities as unrewarding or unbeneificial. The third exogenous factor is external constraints or the rules, laws, and norms that govern behavior (Catalano & Hawkins, 1996). Clear and consistent external constraints, such as family rules, lead to skill development (Catalano & Hawkins, 1996). Further, the consequences associated with violating these external constraints influences the perceived rewards for participating in prosocial or antisocial behaviors (Catalano & Hawkins, 1996).
Theory of Social Control

Learned behaviors, as described in the previous section, are maintained through social bonding (Catalano & Hawkins, 1996). A social bond is a reciprocal, transactional relationship between at least two people, meaning that the behavioral outcomes from the relationship are not attributable to either participant alone but are due to repeated social interactions (Catalano & Hawkins, 1996). The social bond is also the central concept of the Theory of Social Control (Hirschi, 1969; Hirschi & Gottfredson, 1988). According to this theory, three elements influence whether or not a social bond occurs (Catalano & Hawkins, 1996). The first element is attachment or the interdependence within a relationship (Catalano & Hawkins, 1996). The more synergistic a relationship, or the more both participants benefit from the relationship, the stronger the attachment. The second element is commitment, or the degree of investment in participating in the activities associated within the relationship or interaction (Catalano & Hawkins, 1996). Commitment occurs for both prosocial and antisocial interactions. For instance, one adolescent may be highly committed to the activities within a drama club, while another may be highly committed to participating in illegal activities within a gang. The third element that influences a social bond is belief in the values of the social unit (Catalano & Hawkins, 1996). This can include the moral code of the social unit. Once a strong belief system is established, it is difficult to break the social bond. Overall, bonding influences behavioral choices because it is the framework for analyzing the costs and benefits of an action or behavior. For instance, adolescents with strong family rules and beliefs may still choose to use alcohol or other drugs; however, research indicates that they are more likely to contemplate their behavior or chose not to participate in deviant behavior.
because of this bond (Brook, Brook, Gordon, Whiteman, & Cohen, 1990). An established social bond may be threatened if one person within the relationship begins to participate in behavior that is inconsistent with the norms and values of the social unit, such as peers who begin to use alcohol or other drugs when the others do not. The path or choice that adolescents take is also explained by the Differential Association Theory within the SDM.

Differential Association Theory

According to Differential Association Theory, a behavior of an individual will be either prosocial or antisocial depending on the predominant behaviors, norms, and values held by those to whom the individual is bonded (Sutherland, 1973). For instance, research evidence suggests that the relationships among delinquents and drug-involved youth are not always characterized by negative affect (Agnew, 1991; Gillmore, Hawkins, Day, & Catalano, 1992). Other evidence indicates that attachment to parents interacts with parents’ own use of alcohol and tobacco in predicting adolescents’ use of these drugs. High attachment to parents who use alcohol or tobacco legally leads to drug use behavior consistent with parents’ use, not necessarily to the legal alternative of no use by the adolescent (Foshee & Bauman, 1992). Thus, deviant behavior can be a valued alternative to prosocial action. Differential associations may vary over time in frequency, duration, priority and intensity (Sutherland & Cressey, 1978). These variations are often dependent upon the different factors that promote and prevent problem behavior, which are further discussed below.
Risk and Protective Factors

There are a multitude of biological, psychological and social factors that contribute to the development and maintenance of antisocial behavior in adolescents (Catalano & Hawkins, 1996). These factors fall into five primary areas, including individual, family, peers, school, and community domains. These factors mediate and moderate the main constructs of the above-mentioned theories in a variety of ways. For instance, there are many risk factors that are associated with the initiation and continuation of both delinquent and substance-using behaviors. Examples of risk factors include: community norms favorable to antisocial behavior, neighborhood disorganization, low socioeconomic status, family history of substance abuse or crime, poor family management practices, family conflict, low family bonding, parental permissiveness, early onset and maintenance of problem behaviors (e.g., aggressiveness), academic failure, early rejection by peers, association with individuals who use alcohol or other drugs or commit crimes, alienation and rebelliousness, attitudes favorable to substance use and crime, and early onset of substance use or criminal behavior (Hawkins, Catalano, & Miller, 1992).

There are also protective factors that prevent adolescents from participating in antisocial behavior (Hawkins, Catalano, & Miller, 1992). Further, if youth begin to experiment with alcohol or other drugs or criminal behavior, protective factors can curtail these behaviors from developing into more problematic issues such as substance abuse or delinquency. The various protective factors can be generalized into three broad categories (Catalano & Hawkins, 1996). The first category consists of individual characteristics that assist adolescents in maintaining prosocial behavior, such as a resilient temperament,
well-developed social skills, intelligence, and emotional control. The second category includes family bonding and warmth. Families that are cohesive, trusting, have well-established rules, utilize authoritative parenting strategies, and promote healthy behaviors and values during childhood are more likely to prevent the development of antisocial behavior in their children (Hawkins, et al., 1992). The third and final category involves external social support that promotes the development of an adolescent’s abilities, provides the resources for him or her to pursue life goals, and reinforces a prosocial belief and value system (Catalano & Hawkins, 1996). External social support may include participation in extracurricular school activities, religious groups, volunteer organizations, or community mentoring programs such as Big Brothers or Big Sisters.

Protective factors are believed to prevent initiation and maintenance of antisocial behavior indirectly through interaction with risk factors and thus, mediate or moderate an adolescent’s exposure to risk (Hawkins, et al., 1992; Rutter, 1990). For instance, a female adolescent would be deemed at risk for substance abuse or delinquency because she resides in a lower socioeconomic neighborhood with poor community organization and has poor supervision from her parents due to their own issues with substance abuse. However, despite these risk factors, the adolescent’s resilient temperament and participation in extracurricular school activities, such as the debate and tennis teams, prevent her from initiating alcohol or drug use or experimenting with criminal behavior. In particular, her tennis and debate teams promote prosocial behavior by teaching her problem-solving, decision-making, goal-setting, and stress-management skills, and promoting values such as teamwork, healthy living, dedication, and persistence. The teams also enforce strict rules prohibiting delinquent behavior, including substance use
and truancy. Additionally, her teammates and coaches provide a supportive and prosocial external network, which reinforces the adolescent’s desire to not engage in antisocial behavior like her immediate family members.

Social Development Model Summary

The SDM utilizes constructs from Social Learning Theory, Theory of Social Control, and Differential Association Theory as well as empirical evidence from research on risk and protective factors to predict and explain antisocial behavior among children and adolescents (Bandura, 1977; Hawkins, et al., 1992; Hirschi, 1969; Sutherland, 1973). In general, the SDM indicates that social learning processes influence bonds of attachment to certain individuals or activities, which in turn reinforces a child or adolescent’s belief in or commitment toward a specific behavior, which can either result in prosocial or antisocial outcomes (Catalano & Hawkins, 1996). Risk and protective factors, which mediate and moderate the social learning processes, attachment bonds, and strength of commitments and beliefs within the SDM, also influence this linear concept of behavior development. The general relationship between the various constructs of the SDM is exhibited in Figure 1.

According to SDM, there are three primary ways that antisocial behavior is initiated and maintained among children and adolescents (Catalano & Hawkins, 1996). First, antisocial behavior is initiated when opportunities for participating in prosocial interactions or activities are denied or withheld. This occurs when a child is not provided with opportunities to develop the skills necessary for prosocial interactions or the social environment does not reinforce the child’s appropriate prosocial behavior (Catalano & Hawkins, 1996). For example, due to poor parent-child bonding, a child may feel the
Figure 1. The Social Developmental Model of Antisocial Behavior – General Model
need to act out aggressively in order to be recognized by his or her parents. This interaction, if repeated over time, reinforces the child to continue acting aggressively toward others in order to receive the attention he or she needs. Antisocial behavior is also initiated when a child or adolescent perceives the benefits of a deviant action as more rewarding than the costs of such behavior (Catalano & Hawkins, 1996). Even individuals raised in an environment with prosocial norms may commit a crime or use alcohol and other drugs because they perceive the potential costs of such actions as low and the benefits as high (Matza, 1964). Peer pressure to perform a deviant behavior during adolescence is a common example of this phenomenon (Agnew, 1991). Often times, adolescents will smoke a cigarette or become intoxicated, steal an item from a local convenience store, or participate in other delinquent behaviors while in school in order to receive approval from their peers or be included with a specific social group (Catalano & Hawkins; 1996; Brown, et al., 2005). Finally, antisocial behavior results when a child is bonded to family members, peers or other social units (e.g., schools, community organizations) who adhere to antisocial beliefs and values (Catalano & Hawkins, 1996). Adolescents who have delinquent or substance-using peers, who attend schools that are permissive of or passive toward antisocial behaviors, or who live with family members with antisocial tendencies are more likely to adopt the manners, values, and beliefs of these groups.

As implied by the SDM, the development and maintenance of antisocial behavior occurs over time (Catalano & Miller, 1996). Individuals tend to exhibit different types of antisocial behavior as they progress through childhood and adolescence. Specific social interactions also influence the initiation and persistence of deviant behavior at different
stages of development (Catalano & Hawkins, 1996). Therefore, the SDM utilizes four models to explain the etiology of antisocial behavior during the following developmental periods: preschool, elementary school, middle or junior high school, and high school.

During the preschool period, behavior is primarily influenced by the previously described constitutional factors (e.g., birth weight, temperament), position in the social structure, and the interactions with family members and other caregivers (Barnard, 1992; Catalano & Hawkins, 1996; Werner & Smith, 1992). Aggressive tendencies and other forms of conduct disorder are exhibited during this time if the relationship between family members and other caregivers is poor and there is a lack of protective factors to mediate this interaction (Catalano & Hawkins, 1996; Dodge, et al., 2009). At the elementary school level, a child’s behavior is influenced by participation in more activities outside of the family and involvement with other individuals including classmates and teachers (Brophy & Good, 1986; Catalano & Hawkins, 1996; Dryfoos, 1990). Substance use and delinquent behavior may be initiated during this time if the child is primarily reinforced for antisocial behavior. Relationships and activities become more complex upon entry to middle or junior high school (Catalano & Hawkins, 1996). Early adolescent behavior is influenced by a myriad of factors including participation in extracurricular activities, as well as interaction with peers, family members, and school personnel (Catalano & Hawkins, 1996; Elliot, Huizinga, & Ageton, 1985; Fleming, et al., 2008). If antisocial behavior persists during this developmental stage, then an adolescent’s substance use and delinquent behavior is likely to increase and diversify (Catalano & Hawkins, 1996). Finally, antisocial behavior can become increasingly severe and complex in the high school developmental period (Catalano & Hawkins, 1996). This
is partly because substance abuse and delinquency are influenced by the practices, beliefs, and values of peers, family members, school personnel, and community members during this time (Choi, Harachi, Gillmore, & Catalano, 2005; Yu & Stiffman, 2010). If antisocial behavior continues as an adolescent ages and gains more independence, it is likely that his or her substance use and delinquent behavior will become increasingly problematic and negatively influence social, academic, and vocational functioning (Laundra, Kiger, & Bahr, 2002). The majority of participants in the current study are of high school age and the SDM for the high school period is exhibited in Figure 2.

According to the SDM, antisocial behavior can be prevented or curtailed by employing interventions that interrupt the various pathways that promote substance use and deviancy, and enhance components of the pathways that encourage prosocial behavior (Catalano & Hawkins, 1996). Multiple interventions should be used because, as the SDM indicates, there are many direct and indirect pathways that result in antisocial behavior (Catalano & Hawkins, 1996). For instance, interventions for an adolescent could include participation in a life skills group to enhance social and coping skills, tutoring to improve school bonding, expansion of a prosocial support network to provide more positive external social support, and individual and family counseling (Nissen & Pearce, 2011; Tripodi & Bender, 2011). However, before any intervention can be implemented the adolescent should be assessed for the risk and protective factors that contribute to substance use and deviant behavior (Winters, Latimer, & Stinchfield, 2001). This information will in turn assist in guiding treatment planning.
Prosocial Path

Perceived opportunities for prosocial interaction/involvement with prosocial family, peers, school personnel, community members & activities

Interaction/involvement in with prosocial family, peers, school personnel, community members & activities

Perceived rewards for interaction with prosocial family, peers, school personnel, community members & activities

To perceived opportunity for prosocial interaction/involvement with prosocial people

Attachment & commitment to prosocial family, peers, community members, school personnel & activities

Belief in prosocial family, peer, community, & school values

High rate delinquency & drug abuse

Belief in antisocial family, peer, & community values

Attachment & commitment to drug using and criminally involved family, peers, school personnel, & community

To perceived opportunity for interaction with drug using & criminally involved people & involvement in drug use & delinquency

Skills for interaction/involvement

Antisocial Path

Figure 2. The Social Developmental Model of Antisocial Behavior – High School Period
Assessing Adolescents for Substance Use Disorders

Adolescents are assessed for substance use disorders and other problem behavior in a variety of settings including schools, juvenile care facilities, inpatient settings, emergency rooms, and general health clinics (Winters, 1999). Broadly stated, there are three main types of substance use assessment: screening, comprehensive, and drug testing via urinalysis or other biological specimen (Brener, Billy, & Grady, 2003; Winters, et al., 2001). The purpose of a screening is to assess for the potential of a substance use disorder and the need for more extensive testing (Chinet, Plancherel, Bolognini, Holzer, & Halfon, 2005). Screening instruments usually consist of short self-report forms that are completed in approximately 30 minutes or less (CSAT, 1999). The use of screening measures in juvenile justice settings is practical because they quickly provide personnel with the information needed to determine the best possible short-term placement for a young offender and dictate the need for further assessment (Winters, 1992). Screening instruments are also cost-effective because they prevent unnecessary testing from occurring or misplacement in juvenile justice facilities (Winters, 1999). As implied, a comprehensive assessment is a more exhaustive form of evaluation in comparison to a screening (Winters & Kaminer, 2008). It involves completing a battery of tests that evaluate a variety of domains such as a respondent’s medical, education, employment, familial, social, psychological, and substance use history. A comprehensive assessment may require the interviewer to gather collateral information from other sources including parents, teachers, probation officers, and agencies such as the Bureau of Criminal Information (CSAT, 1999).
Drug testing may be used in conjunction with comprehensive assessment to ensure valid self-report of substance use. In many organizations, including some juvenile justice service settings, drug testing may be the sole means of substance use assessment (Dickinson & Crow, 1997). Drug testing is a technical analysis of biological specimen such as urine, hair, blood, sweat, or saliva to assess for the presence of specific drugs or their metabolites (Wish & Gropper, 1990). Urinalysis is the most common form of drug testing in the United States juvenile justice system. It is frequently used when young offenders are first arrested, while participating in the court system, and during probation (Dickinson & Crow, 1997). The majority of substances, including alcohol, can be detected via urinalysis between a 1- to 7-day period following use and depending on the substance (Oellerich, 1996). Some individuals attempt to thwart their urinalysis results by following recommendations found on websites or other resources, such as drinking copious amounts of water or vinegar (NORML, 2011). However, these methods have been deemed ineffective (Cook, Caplan, LoDico, & Bush, 2000). Urinalysis has continued to become a more common form of substance use assessment due to conflicting information about the validity of self-report in reporting substance use behavior, especially among adolescents (Brener, Billy, & Grady, 2003; Burleson & Kaminer, 2006; Williams & Nowatzki, 2005).

Validity of Adolescent Self-Report

The debate about the validity of adolescent self-report about substance use behavior has existed for some time (Bailey, Flwelling, & Rachal, 1992; Brener, et al., 2003; Single, Kandel, & Johnson, 1975; Winters, et al., 2001). Results from some previous research studies deemed the utility of adolescent self-report to be fair to limited.
For instance, Williams and Nowatzki (2005) measured the validity of self-report of substance use among 367 adolescents referred for substance use assessment. Participants completed a substance use history structured interview administered by a clinician and also provided a urine sample for analysis. Overall, 28% of the self-report results were not confirmed by urinalysis. In adolescents who denied substance use, 26% had a positive urinalysis. Also, 34% of participants admitting to substance use had a negative urinalysis. Yacoubian (2001) also arrived at a similar conclusion after comparing marijuana urinalysis results to self-reported 30-day marijuana use from 33,313 juvenile arrestees surveyed through the Arrestee Drug Abuse Monitoring program. Findings indicated that the agreement between self-report and urinalysis tended to vary by jurisdiction with correlation coefficients ranging from .11 to .49. However, each jurisdiction reported consistent agreement over a 7-year period and thus, self-report among participants was determined to be consistently fair to limited.

Typically, adolescents are accused of lying when their self-report is found to be inaccurate, and while it is true that some youth lie about their substance use history on purpose, there are a variety of reasons data collected from adolescents is incorrect (Brener, Billy & Grady, 2003). Some youth may struggle to provide accurate information about their substance use history because of lack of insight, difficulty with attentiveness, issues with comprehension and recall, immaturity and possible language barriers (Brener, et al., 2003; Winters, et al., 2001). Adolescents also tend to change information about themselves over time as their perspectives, beliefs and values change (Brener, et al., 2003). For instance, adolescents tend to underreport their substance use history during an intake interview upon entering a substance abuse treatment program and then provide a
more accurate estimate upon treatment completion (Aronen, Noam & Weinstein, 1993). Thus, some substance abuse treatment programs may see an increase in alcohol and drug use among some youth as they progress in treatment, when in reality, these adolescents are likely becoming more comfortable and trusting of the program and its staff and thus, are more willing to disclose personal information such as substance use (Brener, et al., 2003).

Another factor that influences adolescent self-report is social acceptance, where most youth prefer to be valued and validated by their peers and adults (Brener, et al., 2003). Thus, they will provide inaccurate information about themselves in order to promote acceptance from others. For instance, youth are likely to deny previously made endorsements of behavior that is viewed as intimate, deviant or illegal (Fendrich & Vaughn, 1994), which includes reports of alcohol and drug use (Fendrich & Rosenbaum, 2003; Pedersen, 1990; Shillington & Clapp, 2000). Self-acceptance, along with social acceptance, also influences accurate self-report. Results from previous research suggests adolescents are likely to inaccurately report or deny behavior that conflicts with their identity and values (Brener, et al., 2003; DeMaio, 1984; Midani, 1989; Pearson, Ross, & Dawes, 1992). Because adolescent identity development is mercurial in nature (Coleman & Hendry, 1990; Feldman & Elliott, 1990; Rutter & Rutter, 1993), youth tend to make revisions to past memories to fit with their most recent identity, meaning their reports of past substance use may be more reflective of current substance use (Collins, Graham, Hansen, & Johnson, 1985). Adolescents also tend to provide more accurate information about their alcohol and drug use if they are asked about substances they use frequently as opposed to infrequently (Fendrich & Mackesy-Amiti, 2000; Mensch & Kandel, 1988)
and substances they have used recently (e.g., 30-day use) instead of in the past (e.g., lifetime use) (Bailey, Flwelling, & Rachal, 1992; Single, Kandel, & Johnson, 1975).

Despite the tendency to change responses, results from previous research provide support for substance use assessment using adolescent self-report. In particular, Winters and colleagues (2001) composed a literature review on adolescent substance abuse, which included highlighting key studies and specific markers deeming adolescent self-report to be valid. These markers included having a large portion of adolescent participants in a clinic-referred setting admit to illicit drug use (Brown, et al., 1998) and having higher rates of drug use of psychosocial problems in adolescent clinical samples in comparison to community or school samples (Maisto, Connors, & Allen, 1995). Other research found that adolescent participants had low rates of faking bad on questionnaires about substance use; youth self-report has been recorded as consistent between parents, teachers and archival records (Shaffer, Schwab-Stone, Fisher, & Cohen, 1993); and overall, adolescent self-disclosure about substance use is generally consistent over time (Winters, Stinchfield, Henly, & Schwartz, 1991).

More recent research confirms the above-mentioned findings. Rosenbaum (2009) used test-retest data from the Youth Risk Behavior Survey to compare adolescent responses about their risk behaviors at intake and after a 2-week interval. Results indicated participants provided consistent information about their sex, drug, alcohol and tobacco histories in comparison to other risk behaviors (e.g., unhealthy eating). In another study, Burleson and Kaminer (2006) tested the association between urinalysis, self- and parent-report at baseline, 3- and 9-month follow-up among 88 male and female adolescents participating in a treatment study. They determined that overall, urinalysis
results and participant self-report did not differ significantly at follow-up. A similar study compared arrested juvenile gang members’ self-report of recent drug use to their urinalysis results (Webb, Katz, & Decker, 2006). Study findings indicated that participants who admitted being involved in a gang tended to underreport their drug use in comparison to participants who were juvenile offenders but not involved in a gang. However, this difference was not statistically significant, suggesting self-report is a valid technique when assessing juvenile offenders with a history of gang membership.

These supportive findings suggest adolescent self-report can be a useful mode of assessment in a variety of settings. There are also methodological strategies that can be employed to improve adolescent self-report. As mentioned above, recall among adolescents tends to be more accurate if they are asked about current or recent behavior as opposed to having to use long-term recall (Bachman & O’Malley, 1981). Similarly, questions assessing age of initiation of alcohol and other drug use tend to elicit inaccurate responses among adolescents, which can be contributed to forgetting over time (Bailey, et al., 1992; Engels, Knibbe, & Drop, 1997; Johnson & Mott, 2001; Shillington & Clapp, 2000). Some youth may struggle responding to questions containing unfamiliar terms or broad reference periods (Bailey, et al., 1992; O’Malley, Bachman, & Johnston, 1983). Adolescents are more likely to provide accurate information if questionnaires use simple language and specific and short reference periods.

Previous research suggests that adolescents are more responsive to and provide more accurate information when required to complete self-administered questionnaires in comparison to interview-administered questionnaires. In fact, adolescents have been recorded as being more sensitive to mode of administration than adults (Turner, Lessler
In several studies, the greater privacy provided by the self-administered questionnaire format generated higher reported rates of alcohol and other drug use (Schober, Fe Caces, Pergamit & Branden, 1992; Turner, et al., 1992). Research results indicated that adolescents provided even higher reported rates of alcohol and other drug use when using computer-assisted versus paper-pencil forms of self-administered questionnaires (Turner, et al., 1998; Wright, Aquilino, & Supple, 1998), although similar studies disputed these findings when information was gathered in a school setting (Beebe, Harrison, McCrae, Anderson, & Fulkerson, 1998; Hallfors, Khatapoush, Kadushin, Watson, & Saxe, 2000). Also, there may be gender differences in questionnaire administration and self-report among adolescents. Webb and colleagues (1999) found that adolescent females attending a community health clinic endorsed a greater frequency of alcohol and marijuana use when completing the self-administered questionnaire on a computer as opposed to a paper-pencil format, while the opposite results were generated for adolescent males. Effects of mode of administration may also differ depending on the substance being measured (Turner, et al., 1992).

Two other methods to improve validity in self-report are including a fictitious drug in the questionnaire and using biochemical measures in conjunction with administering a questionnaire. One study assessing the utility of including a fictitious drug in a questionnaire determined that few participants endorsed using the fictitious drug and those who did were more likely to report maximum frequency of other real drug use, which indicates they were likely overreporting (Poulin, MacNeil, & Mitic, 1993). As previously mentioned, drug testing is considered to be the gold standard in assessing adolescent substance use because this mode of assessment is deemed more objective and
less susceptible to bias than other measures (Patrick, et al., 1994). However, this mode of assessment can provide limited information because alcohol use can only be assessed within a 24-hour period and blood tests are best used with heavy drug use (Midanik, 1988). Also, even though urinalysis is more technologically advanced than saliva, hair and sweat assays (Brener, et al., 2003), it can produce false results. For instance, two studies found a moderate percentage of false negative urinalysis results when compared with self-reported marijuana use (Akinci, Tarter & Kirisci, 2001; Murphy, Durako, Muenz, & Wilson 2000).

Although the debate over the validity of adolescent self-report continues, there appear to be benefits to using all three forms of assessment when considering the possibility of substance use disorder in adolescents (Brener, et al., 2003; Winters, et al., 2001). Biochemical measures provide immediate information about substance use behavior; screening measures provide initial information about the severity of substance use and need for further assessment; and comprehensive assessment gathers detailed information about the causes of substance use and guides in treatment intervention (Winters, 1999). For the purposes of this study, more information about screening for substance use disorders in adolescents is provided in the next section below.

**Overview of Screening Instruments**

A variety of screening instruments have been developed to quickly assess adolescents for substance abuse issues. A description of the screening measures that are currently utilized in treatment and research settings is provided in Table 1. Although each of these instruments was initially validated for use, few have been extensively tested, especially among adolescent subpopulations such as juvenile offenders (CSAT, 1999).
This oversight calls the utility of many of these measures into question. It should also be noted that half of the instruments described only measure alcohol use or specific illicit drug use (e.g., marijuana use), but not many substances. This method of screening is limited because, as the above-mentioned results from the Monitoring the Future Survey and National Survey on Drug Use and Health indicate, many adolescents, including juvenile offenders, tend to experiment with more than one substance (Johnston, et al., 2011; SAMHSA, 2009; Teplin, Abram, McClelland, Dulcan, & Mericle, 2002; Vaughn, Freedenthal, Jenson, & Howard, 2007).

Another limitation is that many of these screening instruments were developed for use in only one type of environment, such as an emergency room or inpatient setting. Screening instruments tend to have more utility if they can be administered in a variety of settings, which promotes more convenient communication and referral between treatment settings (CSAT, 1999). According to Winters and Kaminer (2008), the most clinically useful and well-researched screening instruments are the CRAFFT (Knight, Shrier, Bravender, Farrell, Vander, & Shaffer, 1999) and the Personal Experience Screening Questionnaire (PESQ; Winters, 1992), which are briefly described below. Information about the MAYSI-2, POSIT and SASSI-A2 is also provided because these measures are more likely to be used in juvenile justice settings (Grisso, Vincent, & Seagrave, 2005).

**CRAFFT**

The CRAFFT is a six-item instrument that is administered verbally to screen for both alcohol and drug use disorders (Knight, et al., 1999). Each letter in the CRAFFT acronym is associated with a specific question in the measure. C: Have you ever ridden
<table>
<thead>
<tr>
<th>Instrument</th>
<th>AOD</th>
<th>Purpose</th>
<th>No. of Items</th>
<th>Completion Time</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adolescent Drug Involvement Scale (ADIS)</td>
<td>Drugs</td>
<td>Measures level of drug involvement for research &amp; evaluation purposes.</td>
<td>12</td>
<td>4-5</td>
<td>Moberg, D. P., &amp; Hahn, L. (1991)</td>
</tr>
<tr>
<td>CRAFFT</td>
<td>AOD</td>
<td>Screens for risk of substance abuse using verbal format.</td>
<td>6</td>
<td>5-10</td>
<td>Knight, et al. (1999)</td>
</tr>
<tr>
<td>Drug and Alcohol Problem (DAP) Quick Screen</td>
<td>AOD</td>
<td>Identifies substance use problems by assessing for depression, relationship with parents, &amp; parents’ use of AOD.</td>
<td>30</td>
<td>5-10</td>
<td>Schwartz, R. H., &amp; Wirth, P. W. (1990)</td>
</tr>
<tr>
<td>Drug Use Screening Inventory-Revised (DUSI-R)</td>
<td>Drugs</td>
<td>Comprehensively estimates likelihood of drug use disorder by assessing a variety of problem areas.</td>
<td>159</td>
<td>20-40</td>
<td>Kirisci, L., Mezzich, A., &amp; Tarter, R. (1995)</td>
</tr>
<tr>
<td>Massachusetts Youth Screening Instrument – Version 2</td>
<td>AOD</td>
<td>Identifies youth experiencing thoughts, feelings, or behaviors that may be indicative of mental disorders.</td>
<td>52</td>
<td>10-15</td>
<td>Grisso, T., &amp; Barnum, R. (2003)</td>
</tr>
<tr>
<td>Personal Experience Screening Questionnaire (PESQ)</td>
<td>Drugs</td>
<td>Screens for psychosocial problems &amp; need for further assessment for drug use.</td>
<td>10</td>
<td>40</td>
<td>Winters, K. (1992)</td>
</tr>
<tr>
<td>Instrument</td>
<td>AOD</td>
<td>Purpose</td>
<td>No. of Items</td>
<td>Completion Time</td>
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<tr>
<td>Problem Oriented Screening Instrument for Teenagers (POSIT)</td>
<td>AOD</td>
<td>Extensive assessment that identifies potential problem areas related to substance use.</td>
<td>159</td>
<td>20-30</td>
<td>Rahdert, E. (1994)</td>
</tr>
<tr>
<td>Substance Abuse Subtle Screening Inventory for Adolescents – Second Version</td>
<td>AOD</td>
<td>Identifies youth who need further assessment and possible treatment for substance use disorders</td>
<td>100</td>
<td>15</td>
<td>Miller, F. G. &amp; Lazowski, L. E. (2001)</td>
</tr>
<tr>
<td>Teen Addiction Severity Index (T-ASI)</td>
<td>AOD</td>
<td>Assesses for substance use-related problems prior to admission to inpatient care using verbal format.</td>
<td>133</td>
<td>20-45</td>
<td>Kaminer, Y., Bukstein O., &amp; Tarter, R. (1991)</td>
</tr>
</tbody>
</table>
a car driven by someone (including yourself) who was “high” or using alcohol or other drugs? R: Do you use alcohol or other drugs to relax, change your mood, feel better about yourself or fit in? A: Do you ever use alcohol or other drugs when you are by yourself, alone? F: Has any friend, family member, or other person ever thought you had a problem with alcohol or other drugs? F: Do you ever forget (or regret) things you did while using alcohol or other drugs? T: Have you ever got into trouble while using alcohol or other drugs, or done something you would not normally do (break the law, rules, or curfew; engage in risky behavior to you or others)? Recent research provides support for the use of the CRAFFT in a variety of settings. For instance, the scores from the CRAFFT were determined to be highly predictive of the existence of a substance use disorder, as defined by DSM-IV-TR criteria, among adolescents residing in a large hospital-based clinic (Knight, et al., 1999). Another study used the CRAFFT to screen adolescents in a general pediatric setting (Knight, Sherritt, Shrier, Harris, & Chang, 2002). Results indicated that a cutoff score of ≥ 2 correctly identified 86% of participants with or without a current substance use disorder according to DSM-IV-TR criteria. Although there is evidence for the utility of the CRAFFT, many researchers have recommended that more studies be conducted on the utility of this measure (Knight, et al., 2002; Levitt, Saka, Romanelli, & Hoagwood, 2007; Winters & Kaminer, 2008). It should also be noted that the CRAFFT has not been studied with the juvenile offender population.

Personal Experience Screening Questionnaire

The Personal Experience Screening Questionnaire (PESQ) is a 40-item screening measure that assesses the following: drug use history, psychosocial problems, distortion
tendencies, and problem severity (Winters, 1992). It is administered in paper-pencil format and requires approximately 10 minutes to complete. Similar to other screening instruments, results from the PESQ are dichotomous and either identify respondents as “green flags,” where no assessment referral is needed,” or “red flags” where further assessment is warranted and participation in substance abuse treatment is highly likely. An initial validation of the PESQ was conducted with 649 adolescent participants who were enrolled in either residential or outpatient substance abuse treatment programs (Winters, 1992). Results indicated that an empirically derived cutoff score produced an 87% agreement rate in predicting a clinician’s judgment of whether a client needed further drug abuse assessment. Additional findings yielded sensitivity and specificity scores of .89 and .84, respectively. Winters and colleagues (1993) also assessed the utility of the PESQ with a sample of 611 male and female juvenile offenders residing in detention centers. Favorable internal consistency reliability estimates were produced for younger (α = .93; 11- to 15-years-old) and older (α = .95; 16- to 17-years-old) participants. The validity of the PESQ was not measured in this study and the authors noted that, as with the CRAFFT, further research is needed to assess the utility and validity of the PESQ with incarcerated youth.

Massachusetts Youth Screening Instrument – Second Version

The Massachusetts Youth Screening Instrument – Second Version (MAYSI-2; Grisso & Barnum, 2003) is a 52-item measure designed to screen for symptoms of acute emotional crises or more chronic mental health disorders in adolescents. The MAYSI-2 was developed as a brief self-report measure to be administered by persons without
clinical training to adolescents at any entry or transitional placement point in the juvenile justice system. As of 2004, 36 states had adopted the MAYSI-2 for statewide use within at least one branch of their juvenile justice system. Respondents answer “yes” or “no” to questions associated with seven primary scales, including Alcohol/Drug Use, Angry-Irritable, Depressed-Anxious, Somatic Complaints, Suicide Ideation, Thought Disturbance (for boys only), and Traumatic Experiences. A score is produced for each scale, which is compared to cutoff scores suggested in the manual. Scores above the “Caution” cutoff signify problems of a “clinical level of significance,” while scores above the “Warning” cutoff indicate that the respondent has scored higher than 90% of the Massachusetts normative sample at intake with juvenile justice services.

The MAYSI-2 was initially validated with two samples of juvenile offenders. One sample consisted of 176 male and female youth in the Massachusetts Department of Youth Services pretrial and correctional facilities (Grisso, Barnum, Fletcher, Cauffman, & Peuschold, 2001). The other sample consisted of 3,766 males and 238 females admitted to the California Youth Authority or youth corrections (Cauffman, 2004). Factor analyses produced the same factors for males and females in both samples. Measures of internal consistency of items within scales ranged from $\alpha = .61$ to $\alpha = .86$ in both samples. Median item-total correlations ranged from $\alpha = .35$ to $\alpha = .62$ for the different scales. A replication of the primary study with male and female youth in detention in Virginia produced similar alpha coefficients and an almost identical factor structure (Archer, Stredny, & Mason, 2004). In addition, Cauffman (2004) determined that test-retest MAYSI-2 scores were strongly correlated within 3 months between administrations. Results also indicated that among adolescents taking the MAYSI-2 for
the first time, those receiving it in the first few hours after admission produced lower scores on the Alcohol Drug/Use, Angry-Irritable, Depressed-Anxious, Somatic Complaints, and Suicidal Ideation scales than youth who completed the MAYSI-2, 1 day or more after admission.

Problem-Oriented Screening Instrument for Teenagers

The Problem-Oriented Screening Instrument for Teenagers (POSIT; Rahdert, 1991) is a 139-item questionnaire that assesses adolescents in 10 different areas of psychosocial functioning, including: substance use/abuse, physical health, mental health, family relations, peer relations, educational status, vocational status, social skills, leisure/recreation, and aggressive behavior/delinquency. Respondents answer “yes” or “no” to each item and generate a subscale score for each psychosocial area, as well as, a general total score.

The reliability and validity of the POSIT has been previously assessed with juvenile offenders. In a study examining test-retest reliability among 563 residents in the Hillsborough County Juvenile Assessment Center, results indicated that problem levels of the 10 POSIT scales were similar across gender and racial and ethnic groups over two or more administrations of the POSIT (Dembo, et al., 1996). Kappa values indicated that agreement rates tended to be in the fair to good range (.40 to .75). In another study examining the validity of the POSIT, 2,207 delinquent adolescents residing at the Hillsborough County Juvenile Assessment Center completed the POSIT (Dembo, et al., 1996). Using cluster analysis, four different clusters of youth were identified based on their POSIT scale scores. These four clusters included youth at low risk on all 10 scales,
youth at moderate risk on all 10 scales, youth at severe problem levels including substance use/abuse, and youth at severe problem levels including mental health and educational status. In this sample, 30% of participants were readmitted following their first registration at the Juvenile Assessment Center. The two clusters of youth with severe problem levels had significantly higher rates of recidivism than the two low- to moderate-risk clusters; however, the two clusters of youth with severe problem levels did not differ significantly from each other. These results suggested preliminary support for the POSIT as an assessment aid in the juvenile justice system.

Substance Abuse Subtle Screening Inventory for Adolescents – Second Version

The Substance Abuse Subtle Screening Inventory for Adolescents – Second Version (SASSI-A2; Miller & Lazowski, 2001) is a 100-item screening measure used to identify adolescents who are likely to require further assessment and possible treatment for substance use disorders. Since its publication in 2001, the SASSI-A2 has been used in approximately 2,500 youth programs throughout the United States and Canada, such as juvenile justice programs, probation offices, drug courts, and both private and public youth service agencies. The SASSI-A2 consists of 72 true-false questions that measure symptoms, risk and attitude toward alcohol and other drug use, and 28 questions asking respondents to report how frequently they have experienced specific problems related to substance misuse. Nine scales are used to classify the probability of having a substance use disorder, including face-valid alcohol, face-valid other drugs, family and friends risk, attitudes toward substance use, symptoms of substance misuse, obvious attributes, subtle attributes, defensiveness, and supplemental addiction measure. Using these scales, the
SASSI-A2 yields a test classification of either “high probability” or “low probability” of having a substance use disorder.

The reliability and validity of the SASSI-A2 has been examined in both juvenile justice and academic settings. In a reliability study, 70 junior high and high school students were administered the SASSI-A2 twice. Results indicated highly significant agreement between test classifications on the first and second administrations in 94% of the cases (Miller & Lazowski, 2001). Also, test-retest reliability coefficients for the nine scales used for test classification and for two of the supplemental scales were all above .80. In a study to assess validity, 791 participants from juvenile justice programs completed the SASSI-A2 and participated in a DSM-IV clinical interview. In this sample, approximately 86% of participants met DSM-IV criteria for a substance use disorder. Results indicated information collected from the SASSI-A2 was accurate for 93.2% of these cases with 95% sensitivity and 84% specificity.

Although the CRAFFT and PESQ identify whether or not an adolescent currently meets criteria for a substance use disorder or determines the need for further assessment, they provide limited information regarding the underlying factors or causes for the initiation of substance use. In other words, these instruments do not specifically assess for explicit risk and protective factors as identified by the Social Development Model. Corrigan and colleagues (2007) argue that gathering this type of information as part of the screening process is pertinent and time-efficient because it provides the assessor with more concrete data when designing a plan of action for the adolescent client. In order to address this issue in screening instruments, Corrigan and colleagues (2007) developed the
Adolescent Domain Screening Inventory to provide a screening instrument that comprehensively measures risk and protective factors.

Adolescent Domain Screening Inventory

The Adolescent Domain Screening Inventory (ADSI) is a 33-item self-report screening instrument used to evaluate risk and protective factors of adolescents who are assumed to be at risk of using alcohol or other drugs or who are already using these substances (Corrigan, Loneck, & Videka, 2007). It was derived from the Communities that Care Survey (CTCYS; Hawkins & Catalano, 1992) through secondary analysis of archival data. The CTCYS is a 200-item assessment instrument that is administered to middle- and high-school age students to measure 33 empirically identified risk and protective factors within a community. It is also embedded with other measures including the above-mentioned Monitoring The Future Survey (Johnston, et al., 2011) and the National Youth Survey (Huzinga & Elliot, 1986), which assesses for antisocial behavior among adolescents. Due to its number of items, the CTCYS takes approximately 45 minutes to complete. Student scores are aggregated into four risk domains (individual/peer, family, school, and community) that are used to guide community-wide substance abuse prevention interventions. Previous research indicates that the CTCYS is a reliable and valid instrument for community assessment and planning purposes (Arthur, Hawkins, Pollard, Catalano, & Baglioni, 2002). In the initial validation of the CTCYS 11,162 adolescent participants ranging in age from 11 to 18 completed this measure (Arthur, Hawkins, Pollard, Catalano, & Baglioni, 2002). Results from reliability analyses indicated that all but one of the CTCYS scales yielded internal consistency reliabilities greater than .60, and internal consistency averaged .78 across all scales. Construct
validity analyses determined that all of the risk factors were positively associated with measures of other problem behavior, while the protective factors were negatively correlated with these same measures of problem behavior.

Based on these results, the primary objective in designing the ADSI was not to replace the original CTCYS, but rather create a short form of this instrument to screen individual adolescents in school, community mental health, and juvenile justice settings. Corrigan and colleagues (2007) proposed that the results from the ADSI would assist personnel in identifying problematic life areas, or domains, among individual adolescents, which in turn would highlight areas for further assessment and facilitate treatment planning. The development and initial validation of the ADSI are discussed in further detail below.

Development of the ADSI

The ADSI was developed using CTCYS data collected from high school students, grades 9 to 12, residing in New York State in 2000 (Corrigan, et al., 2007). The original study sample consisted of 26,781 completed surveys. Of these, 6,661 cases were selected to serve as the exploratory sample and another 6,675 cases were selected to confirm the initial results (Corrigan, et al., 2007). The respondents in both samples were identified as primarily White, urban and suburban adolescents, and were evenly distributed by grade level and gender.

As previously mentioned, the purpose of designing the ADSI was to create a screening instrument that adhered to the original framework and breadth of the CTCYS (Corrigan, et al., 2007). To accomplish this task, Corrigan (2009) deemed it necessary to include one item from each of the 33 empirically identified risk and protective factors
assessed in the CTCYS, which resulted in the creation of a screening measure with 33 items. Three methods of item selection were employed and compared in the development of the ADSI (Corrigan, 2009). The first item sampling method used was principal components factor analysis to determine the number of factors that derive from the data. An oblique rotation was chosen because intercorrelations were expected among factors. The highest loading item from each factor was selected for the first new screening measure. This method of analysis was also used to compare the factor structure of the current data with the factor structure of the original CTCYS data (Corrigan, et al., 2007).

The second item selection method, multiple regression on factor total, was specifically developed for the purpose of this study (Corrigan, 2009). In order to carry out this analysis, a dependent variable, or factor total, was generated by summing the items identified in the previously described principal components factor analysis. Items from each factor were then stepwise regressed onto the factor total variable. The items that accounted for the greatest proportion of variability ($R^2$) were included in the second new screening instrument. The third item selection method, multiple regression on last 30-day use, was also developed for the purpose of this study (Corrigan, 2009). Similar to the second item selection method, a dependent variable, total use of alcohol and other drugs in the past 30 days, was generated by summing responses to all of the “use in the last 30 days” items within the CTCYS. These values were then recoded to create a dichotomous dependent variable consisting of users and nonusers. The factor items that accounted for the most variance in this dependent variable were included in the third new screening measure.
Analyses for instrument, convergent construct, and concurrent criterion validities were conducted for all three trial ADSI instruments (Corrigan, 2009). To assess for instrument and convergent construct validities, the total scores of each ADSI trial measure were calculated and then compared to the total score of the CTCYS as well as three other outcome scales embedded within the CTCYS, including the Anti-Social Behavior items from the National Youth Survey, the lifetime substance use items from the Monitoring the Future Study Survey, and the 30-day substance use items from the Monitoring the Future Study Survey. Simple regression was employed to analyze the strength of association between each ADSI trial instrument and the outcome scales and the strength of association between the CTCYS and the outcome scales. Concurrent validity was assessed by separately regressing the total score and domain score of each ADSI trial measure onto the original CTCYS.

Results indicated that the three item selection methods identified mostly the same items to be included in the ADSI (Corrigan, 2009). More specifically, all three item-selection methods identified the same 14 items to be included within the ADSI and there were only two instances where the three methods identified differing items. Of the three item-selection methods employed, the multiple regression last 30-day use produced a measure that replicated the correlation on all three outcome scales from the full CTCYS scale and had stronger overall correlations in comparison to the other two ADSI trial instruments (Corrigan, 2009). Thus, this particular measure was selected for further study and initial validation. It should be added that the final ADSI measure consisted of 33 items grouped in the following domains: individual or peer (12 items), school (5 items),
family (8 items), and community (8 items; Corrigan, 2009). Appendix A lists all of the ADSI items and a sampling of one item from each of the four domains is provided below:

Community Domain: If a kid smoked marijuana in your neighborhood, would he or she be caught by the police?

Family Domain: People in my family often insult or yell at each other.

Individual/Peer Domain: I do the opposite of what people tell me just to get them mad.

School Domain: Now, thinking back over the past year in school, how often did you enjoy being in school?

Initial Validation of the ADSI

Initial validation of the ADSI involved evaluating concurrent criterion, instrument construct, convergent construct validity, and predictive validity of this instrument with the above-mentioned exploratory sample (Corrigan, et al., 2007). Since the first three types of validity were addressed in the previous section, predictive validity of the ADSI will be briefly described. Predictive validity for the ADSI was analyzed by determining initial cut points for each domain subscale (e.g., community, family domains) and total scale score (Corrigan, et al., 2007). These cut points were then used to assess the sensitivity, specificity, positive predictive value, and negative predictive value of the ADSI. Initial support was found for the use of the ADSI as a self-report screening measure, to be administered in a paper-pencil format, with both genders, all ages, and all race/ethnicities within the study sample (Corrigan, et al., 2007). More specific psychometric information on the ADSI is provided in the methods section.

According to Corrigan and colleagues (2007), there are many potential advantages for using the ADSI. In particular, since the ADSI assesses for all 33
empirically identified risk and protective factors, it provides a more comprehensive screening in a time-efficient manner than other screening instruments. The ADSI also incorporates a strength-based approach where information is gathered to address both the risk and protective factors of an adolescent client. This form of intervention and assessment is consistent with the values and principles of the field of Counseling Psychology (APA, 2002).

Statement of the Problem

Despite finding support for the development and initial validation of the ADSI, there are limitations to using this instrument. The ADSI was initially validated using archival data and secondary data analysis (Corrigan, et al., 2007). Since this instrument has not been validated using prospective data collection methods, it is currently unknown if this screening measure adequately assesses for risk of substance use disorders and other problem behavior among adolescents. Also, the ADSI was originally designed for administration to youth who are at risk of substance use or who are suspected of using alcohol or other drugs on a continuous basis (Corrigan, et al., 2007); however, the study sample in the initial validation did not consist of an at-risk or high-risk population. Therefore, it is necessary that the ADSI be tested with a sample of adolescents deemed at risk or at high risk for substance use in order to determine the validity and utility of this instrument in comparison to other current screening measures.

Purpose of the Study

Juvenile offenders are considered a high-risk subpopulation of adolescents due to their participation in delinquent and other problem behavior, such as substance use.
Juvenile justice facilities attempt to prevent or treat such problem behavior by conducting assessments and then referring juvenile offenders to appropriate treatment programming. The primary purpose of this study is to initially validate the ADSI among a sample of juvenile offenders residing in Utah observation and assessment facilities. Results from this study will contribute to the current literature on the ADSI and possibly provide evidence for the utility of this measure in juvenile justice settings. Three different analyses will be conducted to validate the ADSI and answer the following research questions listed below.

**Research Questions**

1. Will the four domains of the ADSI (individual/peer, family, school, and community) be confirmed in a sample of adolescents in a juvenile justice setting?

2. Which of the four domains of the ADSI will better predict level of alcohol and other drug use in a sample of adolescents in a juvenile justice setting?

3. What is the convergent validity of the ADSI in relation to other measures and variables, including the antisocial behavior scale from the National Youth Survey (Huizinga & Elliot, 1986) and additional variables such as age of first arrest, age of initiation of alcohol, tobacco and other drug use, regular alcohol use, number of total arrests, previous participation in substance abuse treatment programming, and history of head trauma?

**Summary**

The majority of adolescents experiment with substance use prior to entering young adulthood (Johnson, et al., 2011). Although most of these youth will not
experience severe issues with substance use, a small but significant proportion of adolescents will develop substance use disorders (SAMHSA, 2006). Juvenile offenders are particularly vulnerable to developing substance abuse and dependence disorder due to the strong association between alcohol and drug use and criminal activity (Loeber, et al., 1999; Stice, Myers, & Brown, 1998; Stoiber & Good, 1998). According to the Social Development Model, there are different pathways that influence the development of antisocial behavior among adolescents, which includes substance use (Catalano & Hawkins, 1996). These pathways can be interrupted by identifying the risk areas contributing to the problem behaviors and then implementing an evidence-based intervention (Catalano & Hawkins, 1996).

Substance abuse screening instruments, a form of brief assessment, assist in determining whether a juvenile offender needs further, more comprehensive assessment, and help in formulating recommendations for treatment options (Brener, et al., 2003; Winters, et al., 2001). These measures are practical in a juvenile justice setting because they are time-efficient and cost-effective (Winters, 1999). There are a variety of screening instruments that can be utilized to assess for risk of a substance use disorder among adolescents; however, the Adolescent Domain Screening Inventory (ADSI) is the only current screening measure that also measures the underlying factors likely influencing the problem behavior (Corrigan, et al., 2007). This instrument was initially validated using archival data, but it has not been tested among a sample of adolescents who are likely using alcohol or other drugs, such as juvenile offenders. Therefore, the purpose of this study is to document the validity and utility of the ADSI among a sample of juvenile offenders.
CHAPTER 2

METHODOLOGY

In order to initially validate and assess the utility of the Adolescent Domain Screening Inventory (ADSI), this instrument was administered to juvenile offenders residing in Utah observation and assessment (O&A) facilities. Other pertinent information including demographics, substance use history and history of delinquent behavior was also gathered during this cross-sectional investigation.

Population and Sample

Juvenile Offenders in Utah

The Utah Division of Juvenile Justice Services Annual Report provides information about projected and accomplished goals, annual budget expenditures, and statistical summaries of juvenile justice programs from each fiscal year (DeWitt, et al., 2009). The Utah Division of Juvenile Justice Services (Utah JJS) programs include: home detention, locked detention, receiving centers, reporting centers, case management, community services, observation and assessment, secure facilities, and transition centers. Since the current study involved participants from observation and assessment programs, the remainder of this section will provide more detailed information on youth residing in Utah observation and assessment facilities during the 2008 fiscal year.
Utah Observation and Assessment Facilities

Observation and assessment (O&A) is a 45-day residential program, within Utah JJS, that provides comprehensive evaluation, including psychological, behavioral, social, educational, and physical evaluation of juvenile offenders who have committed a recent crime. Information from these assessments is utilized for treatment planning purposes and providing recommendations for further mental health, behavioral, substance abuse and other support services. There are currently eight O&A facilities in the state of Utah, seven state-operated and one private, which have the capacity to house 85 residents. During the 2008 fiscal year, a total of 671 different youth were served by these five facilities and 618 offenders were admitted to these facilities. The daily average of juvenile offenders residing in Utah O&A facilities was 72.6 residents and their average length of stay was 43 days. It should be noted that this average duration of stay is less than the national average of 68 days (Snyder & Sickmund, 2006). However, this comparison is misleading because the national average includes data from juvenile offenders residing in different types of confinement, including secure care, which would increase the overall length of stay.

Residents in Utah Observation and Assessment Facilities

Juvenile offenders admitted to Utah O&A facilities during the 2008 fiscal year had an average of 5.8 felony and misdemeanor-type convictions (DeWitt, et al., 2009). The majority of these offenses (86%) were against property and public order, while the remaining 14% were against people. These percentages are proportionally similar to national statistics, which indicate that the majority of juvenile offenses committed in
2003 were against property and public order (65%) and the remaining crimes were against people (35%) (Snyder & Sickmund, 2006). On average, residents in Utah O&A facilities during the 2008 fiscal year were first found delinquent when they were 13.4 years old and also had histories of participation in other Utah division programs (DeWitt, et al., 2009). For instance, nearly all residents had been placed in locked detention, 12% had previously been placed in an out-of-home residential program, and about 24% had incurred home detention. Additionally, the majority of these residents had received services from other juvenile justice agencies. Approximately 48% of these youth had been under supervisory probation, 19% had been placed in custody or under the supervision of the Utah Division of Family and Child Services, and 57% had received one or both types of care (DeWitt, et al., 2009).

Similar to national statistics, a disproportionate number of minority juvenile offenders were placed in Utah O&A facilities in 2008 (DeWitt, et al., 2009; Snyder & Sickmund, 2006). Overall, minority youth accounted for 41% of all juvenile offenders admitted to O&A facilities, but represented less than 17% of Utah’s total youth population. Black or African American juvenile offenders were placed over four times more often in O&A facilities than would be expected based on their representation in the state population as a whole. Hispanic and Native American youth were placed over two times more often in O&A facilities than would be expected based on their representation in the state population as a whole. As previously mentioned, national data reflect a similar pattern. Approximately 39% of juvenile offenders in residential programming nationwide in 2003 were White, 38% were Black or African American, and 19% were Hispanic (Snyder & Sickmund, 2006).
Data on 10-year trends indicate that the daily population of juvenile offenders in Utah O&A facilities has changed from 1999 to 2008. The nightly bed count has significantly decreased from approximately 120 youth to 72 youth per night, which is primarily attributed to the 45-day cap placed on length of stay. The number of youth and average age of offenders has remained relatively stable over the past 10 years, with an average of 650 youth being served per year and the average age of youth being 15.8 years. The number of female O&A residents has increased significantly during the past 10 years, and has increased from 18% to 25% during the past 5 years. It should also be noted that the percentage of female juvenile offenders residing in Utah O&A facilities during the 2008 fiscal year (25%) was higher than the national average of incarcerated female juvenile offenders in 2003 (15%; Snyder & Sickmund, 2006). The average number of felony and misdemeanor-type offenses committed by juvenile offenders in Utah decreased by 33% between 1999 and 2008. The percentage of youths admitted with one or more life-endangering felonies declined from 21% in 1999 to 14% in 2008 (DeWitt, et al., 2009). These data reflect the national trend of an overall decrease in juvenile offenses and placements in residential programming, and the substantial increase in female juvenile offenders (Snyder & Sickmund, 2006).

**Juvenile Offenders in Utah and Substance Use**

The Prevention Needs Assessment (PNA) is a 137-item questionnaire that evaluates the need for substance abuse, delinquency, antisocial behavior, and violence prevention services among adolescents between 12 and 18 years of age (Bach Harrison, 2003). This instrument is administered once every 3 years to middle and high school students residing in Utah in order to measure adolescent substance use patterns in the
state. Although the PNA collects extensive information about substance use behaviors among Utah youth, this information cannot be applied to Utah juvenile offenders because the PNA does not identify youth who have, or are currently participating in Utah JJS programming, including O&A.

According to John DeWitt, research consultant for Utah JJS, there is no current statistical information depicting substance use among juvenile offenders in the state of Utah (personal communication, September 9th, 2009). A recent research project conducted by Utah Juvenile Justice Services collected data on the substance use behaviors of juvenile offenders entering detention (personal communication, September 9th, 2009). Upon arriving at the detention facility, each new resident was required to complete a battery of tests, including the adolescent version of the Substance Abuse Subtle Screening Inventory (SASSI-A; Risberg, Stevens, & Graybill, 1995). This 81-item questionnaire measures respondents’ potential for substance abuse or dependence disorders. Since the majority of youth residing in detention do not participate in O&A programming, the data collected from the SASSI-A do not provide an accurate account of substance use behaviors and patterns among juvenile offenders residing in O&A facilities. In addition, the SASSI-A data collected during the time of this current study had yet to be compiled and did not provide numerical descriptions of substance consumption patterns among juvenile offenders in Utah, but instead reported this information in a dichotomized fashion (e.g., extreme use, nonextreme use).

Due to the strong association between substance abuse and criminal behavior (Wilson, et al., 2001), it is of the utmost importance to assess substance use behavior among juvenile offenders in the state of Utah, including those residing in O&A facilities.
The information gathered from assessment assists in identifying youth with substance abuse issues and providing referrals for substance abuse treatment. Utah Juvenile Justice Services could benefit from utilizing more comprehensive substance abuse assessment practices. In particular, instruments based on theories that explain the etiology of deviant behavior and predict future substance use and delinquency among juvenile offenders, such as the Social Development Model, should be considered because they provide the assessor with a more comprehensive understanding of the adolescent and his or her situation, which in turn allows the assessor to make more appropriate and accurate referrals for further assessment and participation in effective treatment programming (Corrigan, et al., 2007). Also, at the time of this study, Utah Juvenile Justice Services did not use an empirically-based screening measure prior to admitting juvenile offenders to O&A facilities for comprehensive assessment. Using a substance abuse screening measure could potentially expedite the assessment process. Therefore, initially validating the ADSI among a sample of juvenile offenders residing in Utah O&A facilities would not only contribute to the research literature on substance abuse assessment, but could also provide support for the incorporation of such a measure into Utah JJS.

The study population for the present investigation consisted of juvenile offenders residing in eight O&A facilities overseen by the Utah Division of Juvenile Justice Services, including: 1) Farmington Bay Youth Center, 2) Ogden O&A, 3) Salt Lake O&A, 4) Salt Lake Girls O&A, 5) Springville O&A, 6) Cache Valley Youth Center, 7) Central Utah Youth Center, and 8) Split Mountain Youth Center. Youth are primarily referred to O&A by their presiding judge but the probation officer overseeing their case may also make a recommendation for referral (personal communication, L. St. Louis,
October 12th, 2009). Each O&A facility houses juvenile offenders for a 45-day period in order to comprehensively evaluate the behavioral, social, educational, and medical needs of each resident. The majority of residents complete a test of cognitive abilities (e.g., Wechsler Intelligence Scale for Children - IV), anger management measures, the Minnesota Multiphasic Personality Inventory - Adolescent Version, and possibly a substance use measure such as the American Society of Addiction Medicine Criteria Assessment or Substance Abuse Subtle Screening Inventory (SASSI-A). It should be noted that, at the time of this study, there appeared to be no consistency in assessment across the eight Utah O&A facilities, meaning that each facility uses different instruments to measure the same psychological, social, behavioral, and biological constructs (personal communication, J. DeWitt, October 12th, 2009). Test batteries are administered and interpreted by licensed psychologists. Recommendations for treatment and further assistance are provided for each resident based on the information gathered from the assessment. While awaiting assessment, O&A residents attend school and participate in skill-building groups, recreation, individualized educational programs, counseling, and community service projects that fulfill court-ordered requirements or repay restitution to victims (DeWitt, et al., 2009).

During the 2008 fiscal year, the above-mentioned O&A facilities had the capacity to hold a total of 74 residents (DeWitt, et al., 2009). The combined average nightly bed count for these facilities was 72.6 residents. The combined total admits for the 2008 fiscal year was 618 residents and overall, 671 juvenile offenders were served by these facilities. The combined average length of stay for residents was 43 days. Specific information on each O&A facility is provided in Table 2.
A convenience sample of 300 juvenile offenders residing in Utah O&A facilities initially was proposed to carry out the analyses of this study, as Kline (2005) recommends a minimum sample size of 300 participants when conducting a confirmatory factor analysis in order to have appropriate power and reliability. Based on the number of admissions to Utah O&A facilities during the 2008 fiscal year (DeWitt, et al., 2009), it was assumed data collection would need to occur over a 6-month period in order to achieve the recommended sample size. However, complications arose with data

Table 2

Use of Observation and Assessment Facilities During Fiscal Year 2008

<table>
<thead>
<tr>
<th>Facility</th>
<th>Capacity</th>
<th>Youths Served(^1)</th>
<th>Admits</th>
<th>Nightly Bed Count</th>
<th>Length of Stay(^2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Farmington Bay Youth Center</td>
<td>18</td>
<td>152</td>
<td>135</td>
<td>16.1</td>
<td>43.7</td>
</tr>
<tr>
<td>Ogden O&amp;A</td>
<td>16</td>
<td>101</td>
<td>93</td>
<td>10.7</td>
<td>42.2</td>
</tr>
<tr>
<td>Salt Lake O&amp;A</td>
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<td>123</td>
<td>115</td>
<td>13.4</td>
<td>42.6</td>
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<tr>
<td>Salt Lake Girls O&amp;A</td>
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<td>58</td>
<td>53</td>
<td>5.9</td>
<td>41.1</td>
</tr>
<tr>
<td>Springville O&amp;A</td>
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<td>87</td>
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<td>44.8</td>
</tr>
<tr>
<td>Cache Valley Youth Center</td>
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<td>47</td>
<td>5.1</td>
<td>39.7</td>
</tr>
<tr>
<td>Central Utah Youth Center</td>
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<td>53</td>
<td>50</td>
<td>5.9</td>
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</tr>
<tr>
<td>Split Mountain Youth Center</td>
<td>--</td>
<td>44</td>
<td>38</td>
<td>4.7</td>
<td>45.2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>74</td>
<td>671</td>
<td>618</td>
<td>72.6</td>
<td>43.0</td>
</tr>
</tbody>
</table>

\(^1\) "Youths Served" is an unduplicated count per facility. "Total" of "Youths Served" is an unduplicated count for the system.

\(^2\) "Length of Stay" calculated as follows: (Nightly Bed Count/Admits)*(Days per Fiscal Year).
collection with three of the O&A facilities, which decreased the likelihood of accruing the previously proposed sample size within the 6-month time period. For example, three of the O&A facilities never administered or returned study questionnaires, despite indicating initial motivation to assist with data collection. The details of other data collection complications are discussed in the limitations section in Chapter 4. The time frame for data collection was expanded from 6-months to 1 year and sample size expectations were adjusted for the purpose of this study and my dissertation committee approved a more realistic sample size of 115 participants. This sample size meets the minimum requirements of at least 100 participants to conduct a confirmatory factor analysis (Gorsuch, 1983; Kline, 2005). Also, a sample size between 100 to 200 participants has been deemed acceptable for models that are not overly complex (Harrington, 2009; Kline, 2005).

Measures

The measures utilized in this study are the same as those used by Corrigan and colleagues (2007) in their initial investigation, which include the Adolescent Domain Screening Inventory, two substance use scales from the Monitoring the Future Survey and an antisocial scale from the National Youth Survey. Also, a demographics measure was developed by the principal investigator to gather more detailed information from participants about some aspects of their history. These measures were designed at an eighth grade reading level.
The Adolescent Domain Screening Inventory (ADSI) is a 33-item self-report screening instrument that measures risk and protective factors in adolescents who are assumed to be using alcohol or other drugs (Corrigan, et al., 2007). Participants respond to each item using a Likert scale, although the wording of the response options vary depending on the ADSI statement or question posed. For instance, the item “I do the opposite of what people tell me just to get them mad,” has the response options “NO!, no, yes,” and “YES!” Conversely, responses for the item “How wrong do you think it is for someone your age to smoke marijuana?” include “very wrong, wrong, a little bit wrong,” and “not at all wrong.” Items fall under four broad risk areas, or domains, including individual and peer (12 items), family (8 items), school (5 items), and community (8 items). When summed, the item responses produce a total risk score and four domain scores, with higher scores indicating greater risk for a substance use problem.

The ADSI was initially validated by comparing the ADSI domains with the domains of the 200-item Community That Cares Youth Survey (CTCYS; Arthur, et al., 2002) and two other instruments embedded within this larger measure, including the substance use history scale from the Monitoring The Future Study Survey (Johnston, et al., 1999) and the antisocial behavior scale from the National Youth Survey (Huizinga & Elliot, 1986). In the initial validation, concurrent criterion validity was determined by assessing the association between the ADSI and CTCYS domain scores and the total scores for both domains. Pearson’s product moment correlation coefficients were computed and reported as follows: individual/peer ($r = .93$), family ($r = .89$), school ($r = .85$), community ($r = .91$), and overall total score ($r = .95$). Instrument validity was $r =$
.56 as measured by correlating the ADSI total score with a dichotomous variable (user, nonuser) from the past 30-day use scale from the Monitoring the Future Survey (Johnston, et al., 1999). Convergent construct validity was $r = .49$ as measured by comparing the ADSI total score with the total score from the antisocial behavior scale of the National Youth Survey (Huizinga & Elliot, 1986). Although the ADSI and antisocial behavioral scale were not strongly correlated, it was noted that this relationship was not relevant to the initial validation of the ADSI because the primary purpose of this measure is to screen for substance abuse and not antisocial behavior among adolescents (Corrigan, et al., 2007).

Cut points were also determined for the four ADSI domains (15 = individual/peer, 6 = family, 3 = school, 4 = community) and total score (35). These cut points were correlated with the above-mentioned dichotomized variable (user, nonuser) from the past 30-day use scale from the Monitoring the Future Survey to measure positive and negative predictive validity. The majority of the correlation coefficients for the ADSI domains were between .50 and .53 except for the school domain ($r = .46$). The negative predictive values ranged from .79 to .91, indicating that the majority of participants who fell below the cut points did not use alcohol or other drugs. However, specificity was low for all of the ADSI domains, ranging from .08 to .38, suggesting that many of the participants identified as nonusers scored above the cut points. Finally, the ADSI domains were correlated to see if participants responded differently across the four domains. Correlations ranged from a high of $r = .58$ for the community and family domains to a low of $r = .36$ for the community and school domains. Intercorrelations between past 30-day use and ADSI total score were consistently above $r = .50$ across gender and race,
except for Black or African American participants on past 30-day use ($r = .46$) and American Indian or Alaskan Native participants on past 30-day use ($r = .45$) and antisocial behavior ($r = .41$).

It should be noted that reliability tests were conducted to assess for internal consistency within each ADSI domain for the present study. Cronbach’s $\alpha$ for each of the four ADSI domains was: .73 (Individual/Peer), .580 (Family), .65 (School), and .63 (Community). These results are discussed in further detail in the following chapters.

Substance Use Scale

The Monitoring the Future Study Survey was designed to measure the change in beliefs, attitudes, and behavior of adolescents toward a variety of social issues, including alcohol and drug use, gender roles, environmental protection, and the government (Johnston, et al., 1999). The questionnaire associated with this study was developed in the early 1970s and administered to 12th graders on an annual basis beginning in 1975. In 1991, 10th and 8th graders also began completing the annual survey. For the purpose of this study, only the lifetime substance use and past 30-day use scales from the larger instrument were used. When combined, these scales consist of 31 questions addressing individual alcohol and other drug use. The substances measured included: 1) smokeless tobacco, 2) cigarettes, 3) alcohol, 4) marijuana, 5) inhalants, 6) hashish, 7) LSD, 8) amphetamines, 9) cocaine, 10) crack, 11) steroids, 12) heroin, 13) other narcotics, 14) depressants, and 15) prescription medication. Previous research provides support of reliability for self-reported alcohol and drug use among respondents on this measure. More specifically, Johnston and colleagues (2009) have used a three-wave approach for assessing reliability. First, evidence has been found that the Monitoring the Future Survey
substance use scales produce similar results as other measures of substance use among adolescents. Secondly, results indicate that participant responses are relatively consistent over a 3- to 4-year period. Finally, due to over three-quarters of seniors reporting trying at least one illicit drug prior to graduation, it is assumed that underreporting is not a significant problem among respondents. Construct validity has also been determined between the substance use scales and other variables within the Monitoring the Future Survey, including attitudes and beliefs about substance use, perceived availability of drugs, self-reported delinquency, truancy, religiosity, school grades, time spent away from home, hours of work per week, and number of parents in the home (Bachman, Johnston, & O’Malley, 1981; Johnston, 1973).

For the purpose of this study, the 16 questions of the past 30-day use scale were modified to better fit the current situation of participants. For instance, in the original Monitoring the Future Survey (Johnston, et al., 2011), 30-day alcohol and drug use outcomes were measured by asking participants, “How many times in the past 30 days have you used [name of substance]?” In this study, the structure of the question was changed to, “How many times did you use [name of substance] 30 days before your last arrest?” This modification was made to obtain an estimate of participants’ prior alcohol and other drug use habits as opposed to their current substance use behavior, which is assumed to be nonexistent while residing in a controlled environment. Participants were also asked to answer questions regarding their lifetime and 30-day use of a nonexistent substance “nariam.” This fake drug was included in the study questionnaire to measure the validity of participants’ self-report. If participants reported using this substance on a consistent basis, then their responses were reviewed to determine if their responses were
false and if necessary, their information was removed from all analyses. This is further discussed in the data cleaning section in the next chapter.

Antisocial Behavior Scale

Similar to the Monitoring the Future Survey, the National Youth Survey measures alcohol and drug use among adolescents, as well as the risk and protective factors associated with substance use behavior (Huizinga & Elliot, 1986). This instrument was specifically designed to collect individual data from participants in the National Youth Survey Family Study, a longitudinal study sponsored by the Center for the Study and Prevention of Violence. For the purpose of this study, only the antisocial behavior scale from the National Youth Survey was administered. This 8-item scale assesses for the presence of delinquency. More specifically, respondents report how often they have 1) been suspended, 2) carried a handgun, 3) sold illegal drugs, 4) stolen a vehicle, 5) been arrested, 6) attacked to hurt, 7) been intoxicated or high at school, and 8) have taken a handgun to school in the past 12 months. Participants respond to these items using a Likert scale with the options “never, 1-2 times, 3-5 times, 6-9 times, 10-19 times, 20-29 times, 30-39 times,” or “40+ times.” Test-retest reliability for the antisocial behavior scale is $r = .84$ and tests of criterion validity between self-reported arrests and official arrest records have yielded moderate correlation coefficients ranging from $r = .51$ to $r = .80$ (Huizinga & Elliot, 1986).

Other Measures

Participants were also asked to provide the following demographic information: age, sex, race/ethnicity, current grade, age of first arrest, age of initiation of alcohol,
marijuana and cigarette use, number of total arrests, previous mental health diagnoses, previous participation in substance use treatment and history of head trauma. This information was gathered using questions designed by the principal investigator.

Procedures

The University of Utah and the Utah Department of Human Services Institutional Review Boards reviewed and approved the study protocol and the precautions utilized to protect the rights of prospective participants in July of 2010. Participant recruitment and data collection occurred from July of 2010 to October of 2011. All recruitment and data collection procedures were based on the Utah Division of Juvenile Justice Services protocol.

Steps were taken to incorporate the ADSI and other study measures into the regular assessment battery administered to residents in each Utah O&A facility through collaboration with facility directors and staff members. Active parent consent and participant assent were obtained prior to data collection. Parents of O&A residents who were 17 years old or younger were informed about the current study while attending a parent orientation meeting. These meetings are usually held within the first 48 hours of a juvenile offender being admitted to his or her designated O&A (L. St. Louis, personal communication, October 12th, 2009). At the orientation, parents were presented with the opportunity to provide consent or prohibit their child’s participation in this study. It should be noted that prior to study initiation, I provided training and instructions to O&A employees who facilitate the parent orientation meetings in order to ensure that parents understood the benefits and limitations of participating in the current study, had
opportunities to ask questions about the research, and most importantly, did not feel coerced into providing their consent for participation.

Before completing the study questionnaire, participant assent was obtained from O&A residents who were 17 years old and younger, and participant consent was obtained from O&A residents who were 18 years old. Similar to the parent orientation meeting, efforts were made to ensure that prospective participants understood the benefits and limitations of the current study, were provided with the opportunity to ask questions about the study, and did not feel coerced into participating. Participants were informed that their responses to the study measures would not be included in their overall O&A assessment and therefore, would not influence treatment recommendations or possible placement in a long-term juvenile care facility. Participants who provided their consent or assent completed each study instrument using a pencil-paper format. To maintain confidentiality, as per protocol requested by the Utah Department of Health and Human Services IRB, participants received an identification number that was matched with their name. This identification number was placed at the top of each measure and thus, participants did not have to provide their name when completing the assessment instruments. After completing the questionnaire, participants placed their responses in a prestamped and addressed envelope, sealed the envelope and gave this envelope to an assigned O&A staff member to mail the questionnaire to me. All information collected from study participants were entered into a password-protected computer and stored in a locked and secure facility.
Participant Demographics

During data collection, 121 participants completed the study survey from four different Utah O&A facilities. This sample consisted of 91 male and 30 female adolescents. The demographic information provided by participants was similar to the national and Utah demographic information reported on juvenile offenders (DeWitt, et al., 2009; Sickmund, et al., 2011). The average age among participants was 15.8 years (SD = 1.34). Sixty-five participants identified their race as White, not of Hispanic origin (53.7%), 39 identified themselves as Spanish/Hispanic/Latino (32.2%), 5 were American Indian (4.1%), 2 were Black or African American (1.7%), 2 were Asian (1.7%), 1 was Pacific Islander (0.8%) and 7 identified themselves as other or a combination of various races (5.8%). Participants also had a history of numerous arrests with approximately 50% of the sample stating they had been arrested between three to eight times.

Participant report of alcohol and other drug use was similar to other reports on alcohol and drug use among juvenile offenders (Prinz & Kerns 2003; Jenson, et al., 2001; Grimely, et al., 2000). This behavior was primarily established in either late childhood or early adolescence, as illustrated in Figure 3. Overall lifetime use of alcohol and drugs was high in comparison to the general population, as shown in Table 3 (Johnston, et al., 2011). Most notably, lifetime use of alcohol and marijuana was high. Over 90% of the sample reported using alcohol and marijuana at least once in their lifetime and approximately 27% of participants reported using alcohol on 40 or more occasions in their lifetime while 67% of participants reported smoking marijuana on 40 or more occasions in their lifetime. This high use of marijuana is likely reflective of a national increase of marijuana use among adolescents in general (Johnston, et al., 2011).
Figure 3. Mean Age of Onset for Substance Use and Arrest
Table 3

Percentage of Lifetime Alcohol and Drug Use Among Participants

<table>
<thead>
<tr>
<th>Substance</th>
<th>0</th>
<th>1 to 2</th>
<th>3 to 5</th>
<th>6 to 9</th>
<th>10 to 19</th>
<th>20 to 29</th>
<th>30 to 39</th>
<th>40 or more</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alcohol</td>
<td>8.3</td>
<td>9.9</td>
<td>10.7</td>
<td>9.9</td>
<td>15.7</td>
<td>10.7</td>
<td>7.4</td>
<td>27.3</td>
</tr>
<tr>
<td>Marijuana</td>
<td>9.1</td>
<td>6.6</td>
<td>3.3</td>
<td>3.3</td>
<td>1.7</td>
<td>8.3</td>
<td>4.1</td>
<td>63.6</td>
</tr>
<tr>
<td>Inhalants</td>
<td>61.2</td>
<td>6.6</td>
<td>9.1</td>
<td>4.1</td>
<td>6.6</td>
<td>3.3</td>
<td>0.8</td>
<td>8.3</td>
</tr>
<tr>
<td>Psychadelics</td>
<td>67.8</td>
<td>6.6</td>
<td>8.3</td>
<td>5.8</td>
<td>4.1</td>
<td>0.8</td>
<td>0.8</td>
<td>5.8</td>
</tr>
<tr>
<td>Amphetamine</td>
<td>54.5</td>
<td>6.6</td>
<td>8.3</td>
<td>5.8</td>
<td>4.1</td>
<td>3.3</td>
<td>4.1</td>
<td>12.4</td>
</tr>
<tr>
<td>Cocaine</td>
<td>51.2</td>
<td>11.6</td>
<td>7.4</td>
<td>5.8</td>
<td>7.4</td>
<td>4.1</td>
<td>1.7</td>
<td>9.9</td>
</tr>
<tr>
<td>Crack Cocaine&lt;sup&gt;a&lt;/sup&gt;</td>
<td>68.6</td>
<td>10.7</td>
<td>5.8</td>
<td>4.1</td>
<td>3.3</td>
<td>2.5</td>
<td>1.7</td>
<td>2.5</td>
</tr>
<tr>
<td>Ecstasy&lt;sup&gt;b&lt;/sup&gt;</td>
<td>38.0</td>
<td>10.7</td>
<td>10.7</td>
<td>3.3</td>
<td>6.6</td>
<td>5.0</td>
<td>5.0</td>
<td>15.7</td>
</tr>
<tr>
<td>Steroids</td>
<td>97.5</td>
<td>0.8</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.8</td>
</tr>
<tr>
<td>Heroin&lt;sup&gt;c&lt;/sup&gt;</td>
<td>75.2</td>
<td>5.0</td>
<td>5.8</td>
<td>3.3</td>
<td>1.7</td>
<td>0.8</td>
<td>1.7</td>
<td>5.0</td>
</tr>
<tr>
<td>Other narcotics</td>
<td>30.6</td>
<td>9.1</td>
<td>12.4</td>
<td>9.1</td>
<td>6.6</td>
<td>7.4</td>
<td>5.0</td>
<td>19.8</td>
</tr>
<tr>
<td>Depressants</td>
<td>44.6</td>
<td>14.0</td>
<td>12.4</td>
<td>5.0</td>
<td>5.8</td>
<td>3.3</td>
<td>4.1</td>
<td>10.7</td>
</tr>
</tbody>
</table>

N= 121, a = 120, b = 115, c = 119
Lifetime use of illicit drugs, especially ecstasy and other narcotics (e.g., improper use of prescription medication), was also extensive. Approximately 16% of participants reported using ecstasy on 40 or more occasions and 20% of the sample reported using other narcotics on 40 or more occasions during their lifetime.

Similar to lifetime drug and alcohol use, participants reported heavy substance use during the 30 days prior to their last arrest as illustrated in Table 4. Of the participants who reported consuming alcohol, approximately 40% drank alcohol on three or more occasions 30 days prior to their last arrest. Of the participants who reported smoking marijuana, approximately 55% smoked marijuana on three or more occasions 30 days prior to their last arrest. Ecstasy use was also noticeably high, as 37% of the participants who used ecstasy reported using this substance on at least three occasions 30 days prior to their last arrest. Other narcotic use patterns, which included prescription medication use, were much higher in comparison to the national average (Johnson, et al., 2011).

Among the participants who reported using other narcotics at least once during their lifetime, 33% of this sample used other narcotics on at least three occasions 30 days prior to their last arrest.

There were also gender differences in substance use among participants. In general, female participants seemed to consume alcohol and use drugs more frequently in comparison to male participants. However, male participants were more likely to endorse extreme substance use, where they consumed alcohol or used drugs on at least 20 occasions in the 30 days prior to their last arrest. For instance, approximately 46% of the male sample reported consuming alcohol between 1-10 times 30 days prior to their last arrest while 71% of the female sample reported doing the same. Similarly, approximately
Table 4

Percentage of 30-Day Alcohol and Drug Use Among Participants

<table>
<thead>
<tr>
<th>Substance</th>
<th>Number of Occasions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0</td>
</tr>
<tr>
<td>Alcohol</td>
<td>30.6</td>
</tr>
<tr>
<td>Marijuana</td>
<td>32.2</td>
</tr>
<tr>
<td>Inhalants</td>
<td>81.8</td>
</tr>
<tr>
<td>Psychadelics</td>
<td>80.2</td>
</tr>
<tr>
<td>Amphetamine&lt;sup&gt;a&lt;/sup&gt;</td>
<td>69.4</td>
</tr>
<tr>
<td>Cocaine&lt;sup&gt;b&lt;/sup&gt;</td>
<td>72.7</td>
</tr>
<tr>
<td>Crack Cocaine&lt;sup&gt;a&lt;/sup&gt;</td>
<td>83.5</td>
</tr>
<tr>
<td>Ecstasy&lt;sup&gt;c&lt;/sup&gt;</td>
<td>62.0</td>
</tr>
<tr>
<td>Steroids&lt;sup&gt;a&lt;/sup&gt;</td>
<td>97.5</td>
</tr>
<tr>
<td>Heroin</td>
<td>87.6</td>
</tr>
<tr>
<td>Other narcotics</td>
<td>56.2</td>
</tr>
<tr>
<td>Depressants</td>
<td>66.9</td>
</tr>
</tbody>
</table>

N= 121, a = 120, b = 119, c = 115
26% of male participants reported smoking marijuana 30 days 1-10 times prior to their last arrest while approximately 41% of female participants reported the same. Female participants also endorsed more frequent use of amphetamine, cocaine, crack cocaine and other narcotic use in comparison to male participants. This pattern is reflective of previous research indicating female adolescents tend to have higher levels of substance use in early adolescence with males having higher levels of use beginning in mid-adolescence and into early adulthood (Chen & Jacobsen, 2012). It should be noted that some of these differences may because there were more male participants than female participants in the study sample, meaning the male sample had greater variability and a more normal distribution in comparison to the female sample, which could account for the higher percentage of female participants abusing alcohol and other drugs.

Regarding other aspects of participants’ history, one-half (50.4%) of participants stated they had participated in some form of substance abuse treatment in the past. In addition, 43% of participants reported having previously received a mental health diagnosis with over half (55.7%) receiving diagnoses of Attention-Deficit/Hyperactivity Disorder, 32.7% reporting a diagnosis of a depressive disorder and 19.2% a diagnosis of an anxiety disorder. It should be noted that some of these diagnoses were comorbid amongst the sample. In addition, approximately one-third (35.5%) of participants reported sustaining a concussion or head injury in their lifetime.

**Analytical Plan**

Research Question 1: Testing Model Fit of the ADSI

A confirmatory factor analysis (CFA) was conducted to answer the research question, “Will the four domains of the ADSI be confirmed in a sample of adolescents in
a juvenile justice setting?” A CFA is a statistical technique used to verify the factor structure of a set of observed variables, such as test scores, in relation to their underlying latent constructs, such as common or unique factors (Child, 2006). As opposed to exploratory factor analysis, the specific relationship between the observed variables and latent factors is proposed prior to conducting statistical tests (Brown, 2006). Data are then gathered to create a factor structure, or model, that is used to verify the originally proposed relationship. This model visually depicts the relationship between the observed variables, their underlying factors, and error variables (Brown, 2006). In a CFA, the structure of the model can be understood by simply looking at the size of the indices generated; however, it is also important to test the goodness of fit between the originally proposed model and the model based on the data collected (Brown, 2006).

There are three broad categories of fit indices recommended when interpreting the results of a CFA: 1) absolute fit, 2) parsimony correction, and 3) comparative fit (Brown, 2006). Absolute fit indices are the most general of the three indices because they evaluate the likelihood of the hypothesis that the models will be equal without taking into account other considerations such as model fit in relation to more restrictive solutions (Brown, 2006). The chi-square test is the most widely used absolute fit index, which measures the amount of difference between the expected and observed covariance matrices. This value is then divided by degrees of freedom ($\chi^2$/df) to assess model fit. A chi-square test that is close to zero indicates little difference between these matrices, and a large chi-square value indicates a poor fit between these matrices, and subsequently, the two models being tested. Typically, a chi-square value less than two indicates adequate model fit (Brown, 2006). Another absolute fit index is the standardized root mean square residual (SRMR),
which is the average discrepancy between the correlations observed in the input matrix and the correlations predicted by the model (Brown, 2006). Outcome values range from 0 to 1 and a value that is close to 0, preferably less than .05, indicates a better model fit.

Parsimony correction indices incorporate a penalty function for poor model parsimony (Brown, 2006). The most common index in this category is the root mean square error of approximation (RMSEA), which tests the extent to which the model fits in the population, but it is sensitive to model complexity while being relatively insensitive to sample size (Brown, 2006). A value close to 0, preferably less than .08, indicates adequate model fit. Comparative fit indices evaluate the fit of a specified model in relation to a more restricted baseline model where the covariances among all input indicators are fixed to 0 (Brown, 2006). Recommended comparative fit indices include the comparative fit index (CFI), which is the ratio between the discrepancy of the specified model to the discrepancy of the independence model. CFI values that approach 1 indicate acceptable model fit. Another recommended comparative fit index is the Tucker-Lewis Index (TLI), which compares the difference between the chi-square values of the two models (Brown, 2006). Similar to the CFI outcome, values closer to 1 indicate acceptable model fit, with recommendations that values be at least .95 (Brown, 2006).

As there are many types of goodness-of-fit indices, there are also many forms of factor extraction to test model fit when conducting a CFA (Brown, 2006). The most common form of factor extraction is maximum likelihood (Beauducel & Herzberg, 2006; Brown, 2006). Maximum likelihood estimation provides parameter estimates that maximize the probability of the observed data or, in other words, that make the observed data most likely (Brown, 2006). One advantage of this extraction method is that it
statistically evaluates how well the correlations among the indicators, as predicted by the factor analysis parameters, are similar to the relationships generated in the input correlation matrix (Brown, 2006). There are three general assumptions when conducting maximum likelihood estimation for CFA, which include: 1) the sample size is large; 2) the indicators have been measured on continuous scales (e.g., approximate interval-level data); and 3) the distribution of the indicators is multivariate normal. If the data violate any of these general assumptions, negative consequences could result, such as having attenuated estimates of the correlations among the indicators, especially when there are floor or ceiling relationships among indicators; generating “pseudofactors” due to item extremeness; and producing incorrect test statistics and standard errors (Brown, 2006).

Since Corrigan and colleagues (2007) used maximum likelihood estimation as the factor extraction method when testing the ADSI, it was determined that this form of CFA would be employed to compare the factor structure of the ADSI with the present sample (Corrigan, et al., 2007). However, because of the small sample size in the current study and the fact that the ADSI items are categorical in nature, it was of concern that the assumptions of maximum likelihood would be violated. Through consultation with statisticians within the University of Utah Educational Psychology Department and reviewing studies from peer-reviewed journals that conducted CFAs with similar data sets and sample sizes, it was determined that a second CFA would be conducted using item parcels and the weighted least squared extraction method (Mike Gardener, PhD, and Dan Woltz, PhD, personal communication, December of 2011; Bagozzi & Edwards, 1998; Bagozzi & Heatherton, 1994; Nasser & Takahashi, 2003; Schallow, 2000). More
information about item parcels and the weighted least squares extraction method is provided below.

A parcel is an observed variable generated by obtaining the mean of two or more items assumed to be conceptually similar and psychometrically unidimensional that can be used to assess the same latent construct (Kishton & Widaman, 1994). Item parcels typically are used to reduce model complexity without having to eliminate items, which would result in the loss of information that could provide meaning about the latent variables (Nasser & Takahashi, 2003). By creating parcels from items that are categorical and skewed, new variables are formed that are more akin to continuous items with normal distributions (Bandalos & Finney, 2001). Item parcels are recommended for studies using CFA when sample sizes are small (Bagozzi & Edwards, 1998; Bagozzi & Heatherton, 1994). They are also recommended more than item-level models because data that are parcelled tend to be more parsimonious, are less likely to have residuals correlate or dual loadings and overall, have less sources of sampling error (MacCallum, Widaman, Zhang, & Hong, 1999).

There are a variety of ways to form item parcels, assuming that the items are unidimensional or that they represent only one latent construct (Little, Cunningham, & Shahar, 2002; Schallow, 2000). Random assignment is a simple technique for building parcels where items are assigned randomly to parcels without consideration of the latent construct (Little, et al., 2002). Item-to-construct balance is another technique where parcels are generated by using item loadings from a single-construct model. For instance, using the loadings as a guide, the three items with the highest loading would form a parcel, the next highest three item loadings would form another parcel and so on (Little,
et al, 2002). Two other methods for creating item parcels include grouping items together if they have a minimum mutual correlation (e.g., 0.3; Cattell & Burdsal, 1975) or grouping items based on content or having similarities (Comrey, 1970; Schallow, 2000). Previous research indicates that each of the above-mentioned methods for item parceling produce equivalent results (Schallow, 2000).

For the purpose of this study, item parcels were formed based on content, using the proposed latent constructs from Corrigan and colleagues’ (2007) original ADSI model. More information about parcel formation for the present study, including parcel distribution and reliability, is provided in the results section. These item parcels were then used in a second CFA, which employed the weighted least squared method. This form of factor extraction is typically recommended when one factor indicator in the proposed model is categorical (Brown, 2006). The weighted least squared method minimizes the discrepancy between the observed and predicted covariance matrices by using a weight matrix for the residuals that is based on the estimates of the variances and covariances of each element and fourth-order moments based on multivariate kurtosis (Brown, 2006). This model fit function is weighted by variances, covariances and kurtosis to adjust for violations in multivariate normality (Brown, 2006).

Research Question 2: ADSI Domains and Substance Use Severity

A multiple regression test was employed to answer the second research question, “Which of the four domains of the ADSI will better predict level of alcohol and other drug use in a sample of adolescents in a juvenile justice setting?” This statistical technique is used to predict the value of one dependent variable from a weighted
A maximized correlation score is obtained to determine if the combination of independent variables significantly explains a proportion of the variance in the dependent variable (Levin & Fox, 2000). This maximized correlation has been stated to be similar to a Pearson correlation coefficient.

In the current study, the independent variables in the regression equation consisted of the 4 ADSI domain scores and the total score on the ADSI. The dependent variable was current substance use, a variable generated from the 30-day alcohol and marijuana use data from the Monitoring the Future Survey (Johnston, O’Malley, Bachman, & Schulenberg, 2010) substance use scale. The current substance use variable consisted of the following three categories: “no use,” where participants had not used alcohol or marijuana in the past 30 days; “some use,” where participants had consumed alcohol or smoked marijuana one to five times in the past 30 days; and “frequent use,” where participants had consumed alcohol or smoked marijuana more than five times in the past 30 days. Information regarding participants’ use of other substances (e.g., ecstasy, cocaine) was not considered when creating this variable due to the varied nature of participants’ use of other substances. It should be acknowledged that a linear regression analysis was employed despite the dependent variable being ordinal. Previous research indicated this form of analysis was permissible because the dependent variable consisted of more than two values (Winship & Mare, 1984). Other forms of regression (e.g., logistic regression) would have been considered if the dependent variable was binary (Winship & Mare, 1984).
Due to the exploratory nature of research question two, stepwise multiple regression was employed in order to determine which specific ADSI domains made a meaningful or significant contribution to the variance in the dependent variable. In stepwise multiple regression, each independent variable was entered one at a time into the regression equation. As each variable was included, a test was conducted to ensure that each variable made a meaningful contribution to the overall analysis. If one variable appeared to be measuring much of the same construct as another variable, it was removed from the regression equation (Pedhazur, 1982).

Research Question 3: Convergent Validity of the ADSI

Pearson’s product moment correlation coefficients were computed to answer the third research question, “What is the convergent validity of the ADSI in relation to other measures and variables, including the antisocial behavior scale from the National Youth Survey (Huizinga & Elliot, 1986)?” The four ADSI domain scores and total score were correlated with other study measures and variables, including the antisocial behavioral scale from the National Youth Survey (Huizinga & Elliot, 1986) and variables such as age of first arrest, age of initiation of alcohol, tobacco and marijuana use, number of total arrests, participation in substance abuse treatment, previous mental health diagnoses and history of head trauma.
CHAPTER 3

RESULTS

A confirmatory factor analysis (CFA) was conducted to ascertain if the factor structure of the data collected from participants was similar to the factor structure of the original model proposed by Corrigan and colleagues (2007). The fit of the model was assessed using five indices: (a) chi-square over degrees of freedom ratio ($\chi^2$/df) of less than 2, (b) standardized root mean square residual (RMSR) less than .05, root mean square error of approximation (RMSEA) less than .08, comparative fit index (CFI) closer to 1 and Tucker-Lewis Index (TLI) closer to 1. Multiple regression analyses were employed to determine if the scores garnered from the ADSI predict substance use behavior and severity. Finally, Pearson product correlations were used to measure convergent validity of the ADSI based on scores from the antisocial behavior scale from the National Youth Study (Huizinga & Elliot, 1986) and other demographic information. The computer software program SPSS Statistics 20.0 was utilized for all statistical analyses, including AMOS for conducting the CFAs, with an established alpha level of .05 for all statistical tests.
Data Inspection and Cleaning

Of the 121 participants who completed the study questionnaire, 2 participants only completed the first 16 questions of the ADSI and did not complete the other 17 questions, which were on another page in the study survey packet. Because of this lack of information, these participants were also removed from all statistical analyses. In addition, 6 participants endorsed using nariam (the fictitious drug included in the study survey to assess validity of self-report) in their lifetime. Since previous research conducted on adolescent substance abuse and self-report indicated that individuals who endorse using a fictitious drug tend to over-report other drug use (Poulin, et al., 1993), each of these participants’ responses was further reviewed to determine if they were over- or under-reporting their use of alcohol or other drugs on the survey or if there was a possible misunderstanding regarding this drug. Five of the participants reported using nariam one to five times in their lifetime and did not report using this fake substance 30 days prior to their last arrest. These participants also seemed forthcoming with their use of alcohol and other drugs and did not appear to over- or under-endorse their substance use in comparison to other participants who denied using nariam. Because of this pattern of report, it was assumed that these participants did not know what nariam was and likely mistook it for another substance, and thus, it was decided to include these participants in all data analyses. Conversely, the remaining participant who endorsed the use of nariam appeared to over-report alcohol and drug use in general, as indicated by endorsing frequent use of numerous substances, which seemed unlikely in comparison to the remainder of the sample. Thus, this participant was removed from all analyses, resulting in a final sample size of 118 participants.
Research Question 1: Testing Model Fit of the ADSI

First Confirmatory Factor Analysis

Two confirmatory factor analyses (CFA) were conducted to answer the research question, “Will the four domains of the ADSI be confirmed in a sample of adolescents in a juvenile justice setting?” As described in Chapter 2, the first CFA used maximum likelihood factor extraction to assess model fit of the original model proposed by Corrigan and colleagues (2007). The model output, including correlation coefficients between factors, regression coefficients between factors and items, and error variances for the first CFA is displayed in Figure 4. This test resulted in a chi-square of 847.23 (df = 489, \( p < .000 \)) and a chi-square to degrees of freedom ratio (\( \chi^2/df \)) of 1.733. The other fit indices for this model are displayed in Table 5. As displayed, some of the fit indices fell within the predetermined guidelines and other fit indices did not. The chi-square to degrees of freedom ratio was less than 2 and RMSEA was exactly .08, while the RMSR was above .05 and the CFA and TLI values were not close to 1.

Table 5

First Confirmatory Factor Analysis of the ADSI

<table>
<thead>
<tr>
<th>Model</th>
<th>Factors (Items)</th>
<th>( \chi^2/df )</th>
<th>RMSR</th>
<th>RMSEA</th>
<th>CFI</th>
<th>TLI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corrigan et al., (2007)</td>
<td>4 (33)</td>
<td>1.733</td>
<td>.107</td>
<td>.080</td>
<td>.646</td>
<td>.618</td>
</tr>
</tbody>
</table>

\( N = 118 \)
Figure 4: Model Output for the First Confirmatory Factor Analysis of the ADSI
Overall, results indicated some degree of fit for the proposed model and also suggested
the data may provide support for the ADSI if the sample size were larger or if a different
mode of factor extraction was employed. Because there were ways to account for these
methodological limitations, a second CFA was conducted using item parcels and the
weighted least squares extraction methodology.

Second Confirmatory Factor Analysis

Item parcels were generated from the ADSI items for the second CFA. These item
parcels were developed by me within the latent constructs suggested by Corrigan and
colleagues (2007) in their original study. More specifically, items were grouped into
parcels based on perceived similarities of the content of items within each of the four
ADSI domains and their overall shape. For instance, items from the Individual/Peer
domain with varying skewness were combined into parcels in order to increase variability
and generate a normal distribution for each parcel (Nasser & Takahashi, 2003; Schallow,
2000). It was decided to not randomly parcel items in order to ensure that items within
specific ADSI domains remained together (Schallow, 2000). Attempts were made to
create parcels that were just-identified by using the optimal number of items (between
two to four items) to identify and represent a latent construct (Brown, 2006; Little, et al.,
2002). The majority (66.7%) of the item parcels generated for the second CFA consisted
of four items. It should be noted that two ADSI items were eliminated when forming item
parcels and when conducting the second CFA. Item 16, “Have any of your brothers or
sisters ever taken a handgun to school?” was eliminated from analysis due to participants’
responses being severely skewed because the majority of participants responded “no.”
Item 33, “During the last four weeks how many whole days have you missed because you
skipped or ‘cut’?” was eliminated because participants provided information about their present school attendance, which is mandatory and enforced while residing in a Utah observation and assessment facility, as opposed to their school attendance 30 days prior to their last arrest. A list of the parcels and the items included within each parcel is provided in Table 6. Descriptive statistics for the item parcels are provided in Table 7.

Reliability analyses were conducted to assess for internal consistency within each item parcel. Cronbach’s $\alpha$ for the item parcels ranged from a low of .214 for Individual/Peer Parcel 1 and Community Parcel 1 to a high of .742 for School Parcel 1 and .790 for School Parcel 2. The overall mean for Cronbach’s $\alpha$ among all item parcels was .482. These results indicated that participants tended to respond in a similar manner to items within some of the item parcels, which produced higher reliability values, while also responding differently to items within other item parcels, which produced lower reliability values. Item parcel-total correlations were also conducted to determine how one parcel was associated with the sum of the other parcels within the same domain. Item parcel-total correlations were $\geq .454$ for the Individual/Peer domain, .411 for the Family domain, .485 for the School domain and .465 for the Community domain. These values suggested that item parcels were moderately correlated with each other within each ADSI domain.

A weighted least squared extraction method, instead of maximum likelihood, was used for the second CFA to account for the latent factors being measured by categorical items (Brown, 2006), as discussed in Chapter 2. Results from the second CFA indicated an improved fit to the proposed model and the observed data in comparison to the first
<table>
<thead>
<tr>
<th>Factor/Item Parcel</th>
<th>Items</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Individual/Peer (IP)</strong></td>
<td></td>
</tr>
</tbody>
</table>
| IP – Parcel 1 | 17. How old were you when you first smoked marijuana?  
18. How old were you when you first attacked someone with the idea of seriously hurting them?  
22. How much do you think people risk harming themselves (physically or in other ways) if they smoke marijuana regularly?  
23. How often do you attend religious services or activities? |
| IP – Parcel 2 | 21. How wrong do you think it is for someone your age to use LSD, cocaine, amphetamines or another illegal drug?  
24. Think about your four best friends (the friends you feel closest to). In the past year (12 months), how many of your best friends have sold illegal drugs?  
26. What are the chances you would be seen as cool if you smoked marijuana?  
28. How many times have you done crazy things even if they are a little dangerous? |
| IP – Parcel 3 | 19. How wrong do you think it is for someone your age to drink beer, wine or hard liquor (for example, vodka, whiskey, or gin) regularly?  
20. How wrong do you think it is for someone your age to smoke marijuana?  
25. I do the opposite of what people tell me just to get them mad.  
27. You’re looking at CD’s in a music store with a friend. You look up and see her slip a CD under her coat. She smiles and says, “Which one do you want? Go ahead, take it while nobody’s around.? There is nobody in sight, no employees and no other customers. What would you do now? |
Table 6 Continued

<table>
<thead>
<tr>
<th>Factor/Item Parcel</th>
<th>Items</th>
</tr>
</thead>
</table>
| **F – Parcel 1**  | 9. My parents ask me if I’ve gotten my homework done.  
11. If you drank some beer or wine or liquor (for example, vodka, whiskey or gin) without your parents’ permission, would you be caught by your parents?  
12. My parents give me lots of chances to do fun things with them.  
14. About how many adults have you known personally who in the past year have used marijuana, crack, cocaine, or other drugs?  
10. People in my family often insult or yell at each other. |
| **F – Parcel 2**  | 13. How wrong do your parents feel it would be for you to smoke marijuana?  
15. Have any of our brothers or sisters ever smoked marijuana? |
| **School (S)**     | 29. My teacher praises me when I work hard in school.  
30. There are lots of chances for students in my school to get involved in sports, clubs, and other school activities outside of class.  
31. Now, thinking back over the past year in school, how often did you enjoy being in school?  
32. Now thinking back over the past year in school, how often did you try to do your best work in school? |
| **Community (C)** | 1. If a kid smoked marijuana in your neighborhood, would he or she be caught by the police?  
2. I like my neighborhood.  
6. How wrong would most adults in your neighborhood think it was for kids your age to use marijuana?  
8. How many times have you changed homes since kindergarten?  
3. There are people in my neighborhood who are proud of me when I do something well.  
4. How much does the following statement describe your neighborhood: crime and/or drug selling?  
5. Are services clubs available in your community for people your age?  
7. If you wanted to get some marijuana, how easy would it be for you to get some? |
| **C – Parcel 1**  | 6. How wrong would most adults in your neighborhood think it was for kids your age to use marijuana?  
8. How many times have you changed homes since kindergarten?  
3. There are people in my neighborhood who are proud of me when I do something well.  
4. How much does the following statement describe your neighborhood: crime and/or drug selling?  
5. Are services clubs available in your community for people your age?  
7. If you wanted to get some marijuana, how easy would it be for you to get some? |
| **C – Parcel 2**  | 6. How wrong would most adults in your neighborhood think it was for kids your age to use marijuana?  
8. How many times have you changed homes since kindergarten?  
3. There are people in my neighborhood who are proud of me when I do something well.  
4. How much does the following statement describe your neighborhood: crime and/or drug selling?  
5. Are services clubs available in your community for people your age?  
7. If you wanted to get some marijuana, how easy would it be for you to get some? |
Table 7

Descriptive Statistics for Item Parcels

<table>
<thead>
<tr>
<th>Factor/Item Parcel</th>
<th>Items</th>
<th>Sk</th>
<th>Kur</th>
<th>Mr</th>
<th>α</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Individual-Peer (IP)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IP - Parcel 1</td>
<td>17, 18, 22, 23</td>
<td>-.25</td>
<td>.01</td>
<td>.07</td>
<td>.21</td>
</tr>
<tr>
<td>IP - Parcel 2</td>
<td>21, 28, 24, 26</td>
<td>.13</td>
<td>-.75</td>
<td>.28</td>
<td>.61</td>
</tr>
<tr>
<td>IP - Parcel 3</td>
<td>19, 20, 25, 27</td>
<td>.11</td>
<td>-.90</td>
<td>.32</td>
<td>.66</td>
</tr>
<tr>
<td><strong>Family (F)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F – Parcel 1</td>
<td>9, 14, 11, 12</td>
<td>-.01</td>
<td>-.22</td>
<td>.33</td>
<td>.65</td>
</tr>
<tr>
<td>F – Parcel 2</td>
<td>10, 15, 13</td>
<td>-.26</td>
<td>-1.13</td>
<td>.06</td>
<td>.14</td>
</tr>
<tr>
<td><strong>School (S)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S – Parcel 1</td>
<td>29, 30</td>
<td>.49</td>
<td>-.77</td>
<td>.60</td>
<td>.74</td>
</tr>
<tr>
<td>S – Parcel 2</td>
<td>31, 32</td>
<td>.14</td>
<td>-.83</td>
<td>.66</td>
<td>.79</td>
</tr>
<tr>
<td><strong>Community (C)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C – Parcel 1</td>
<td>1, 2, 6, 8</td>
<td>-.08</td>
<td>-.54</td>
<td>.06</td>
<td>.21</td>
</tr>
<tr>
<td>C – Parcel 2</td>
<td>3, 7, 4, 5</td>
<td>.03</td>
<td>.40</td>
<td>.11</td>
<td>.32</td>
</tr>
</tbody>
</table>

Sk = skewness; Kur = kurtosis; Mr = mean inter-item correlation; α = Cronbach’s alpha
CFA, with a chi-square of 24.732 ($df = 21, p < .259$) and a chi-square to degrees of freedom ratio ($\chi^2/df$) of 1.178. The model output for the second CFA is displayed in Figure 5. All other fit indices fell within the previously proposed guidelines and are displayed in Table 8. Overall, these fit indices provided support for the four-factor structure of the ADSI, consisting of the Individual/Peer, Family, Community and School domains.

Reliability analyses were conducted to assess for internal consistency within each ADSI domain of the second CFA model. Cronbach’s $\alpha$ for each of the four ADSI domains used in the second CFA was: .73 (Individual/Peer), .58 (Family), .65 (School), and .63 (Community). These values all fell within the recommended reliability coefficient range of .50 – .80 when conducting research in early stages of screening instrument development (Switzer, Wisniewski, Bell, et al., 1999). It should be noted that the Individual/Peer domain was the only domain to achieve the recommended benchmark of Cronbach’s $\alpha$ value of .70 (George & Mallery, 2006). These results suggested that participants may have not responded in the same manner to items within each of the

<table>
<thead>
<tr>
<th>Model</th>
<th>Factors (Items)</th>
<th>$\chi^2$/df</th>
<th>CFI</th>
<th>TLI</th>
<th>RMSR</th>
<th>RMSEA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parcels</td>
<td>4 (11)</td>
<td>1.178</td>
<td>.967</td>
<td>.944</td>
<td>.029</td>
<td>.039</td>
</tr>
</tbody>
</table>

$N = 118$
Figure 5: Model Output for the Second Confirmatory Factor Analysis with Item Parcels
Family, Community and School domains. Also, these results likely indicated that items within each of these three domains could be improved to better measure their represented construct (e.g., items within the Family domain that actually measure familial risk factors). However, these results should be interpreted with caution since measures of reliability are highly influenced by the number of items in a scale and three of the ADSI domains within the above-mentioned reliability analyses consisted of only two item parcels (George & Mallery, 2006).

In addition to assessing internal consistency of each ADSI domain, the relationship between the ADSI domains was analyzed using correlation coefficients provided by the AMOS output for the second CFA. Estimated correlations in CFA output are typically disattenuated, meaning measurement error has been corrected between the two variables (Nunnally, 1978). The estimated correlations between domains for the second CFA model ranged from a low of $r = .55$ for the Individual/Peer and School domains to a high of $r = .86$ for the Individual/Peer and Community domains. These values indicated that the ADSI domains varied from being moderately to strongly associated with each other (George & Mallery, 2006). Also, the correlations between each ADSI domain were significant ($p < .01$). The specific estimated correlation scores are presented in Table 9. Corrigan and colleagues (2007) noted that some correlation between ADSI domains is to be expected, because youth who are at risk or at high risk for using alcohol or other drugs likely have problems in multiple areas of their life. However, Corrigan and colleagues (2007) conducted Pearson product-moment correlations in their study and did not report the disattenuated correlations provided within the AMOS output.
Table 9

Interdomain Correlation Matrix (N = 118)

<table>
<thead>
<tr>
<th>Domain</th>
<th>Individual/Peer</th>
<th>Family</th>
<th>School</th>
<th>Community</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual/Peer</td>
<td>1.0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Family</td>
<td>.66*</td>
<td>1.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>School</td>
<td>.55*</td>
<td>.69*</td>
<td>1.0</td>
<td></td>
</tr>
<tr>
<td>Community</td>
<td>.86*</td>
<td>.78*</td>
<td>.62*</td>
<td>1.0</td>
</tr>
</tbody>
</table>

*p < .01

The AMOS output also provided standardized factor loadings, or regression weights, between the latent factors and items or, in the case of the second CFA, item parcels. These values measured the amount of variance the latent factor accounts for in each item or item parcel. The standardized regression weights for the second CFA model are displayed in Table 10. The loadings of these regression weights ranged from fair to excellent (Tabachnick & Fidell, 2007). Family Parcel 2 had the lowest loading of .49, meaning that the latent factor Family accounted for 24.2% of the variance for Family Parcel 2. Family Parcel 1 had the highest loading of .96, meaning that the latent factor Family accounted for 92% of the variance for Family Parcel 1. Squaring the regression weight value generated the percentage of variance in each of these cases. These findings suggested that some of the latent factors, or ADSI domains, were well-represented by the ADSI item parcels, while other ADSI domains were not. These findings also indicated that some of the ADSI items could be improved.
Table 10

Standardized Regression Weights for the Second CFA Model

<table>
<thead>
<tr>
<th>Content Parcel</th>
<th>Individual/Peer</th>
<th>Family</th>
<th>School</th>
<th>Community</th>
</tr>
</thead>
<tbody>
<tr>
<td>IP - Parcel 1</td>
<td>.59***</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IP - Parcel 2</td>
<td>.74***</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IP - Parcel 3</td>
<td>.83***</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F – Parcel 1</td>
<td></td>
<td>.96***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F – Parcel 2</td>
<td></td>
<td>.49***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S – Parcel 1</td>
<td></td>
<td></td>
<td>.77***</td>
<td></td>
</tr>
<tr>
<td>S – Parcel 2</td>
<td></td>
<td></td>
<td>.64***</td>
<td></td>
</tr>
<tr>
<td>C – Parcel 1</td>
<td></td>
<td></td>
<td></td>
<td>.59***</td>
</tr>
<tr>
<td>C – Parcel 2</td>
<td></td>
<td></td>
<td></td>
<td>.84***</td>
</tr>
</tbody>
</table>

*** p < .001
Research Question 2: ADSI Domains and Substance Use Severity

A multiple regression test was employed to answer the second research question, “Which of the four domains of the ADSI will better predict level of alcohol and other drug use in a sample of adolescents in a juvenile justice setting?” More specifically, stepwise regression was conducted to determine which ADSI domain (Individual/Peer, Family, School, Community or Total Score) best predicted substance use severity as indicated by participants’ reported alcohol and marijuana use 30 days prior to their last arrest. Regression results indicated that the Individual/Peer domain significantly predicted substance use severity in comparison to the other ADSI domains and ADSI total score ($R^2 = .25$, $R^2_{adj} = .24$, $F(1,103) = 34.62$, $p < .001$). This regression model accounted for 25.2% variance in substance use severity, or in other words, items within the Individual/Peer domain had the greatest influence on substance use severity among participants. A summary of the regression model is presented in Table 11. In addition, correlation coefficients between the Individual/Peer domain and substance use severity are presented in Table 12.

Since the first regression analysis excluded the ADSI domains that were not significant from the final model equation, a second regression analysis was conducted to better understand how each ADSI domain contributed to substance use severity, as indicated by participants’ reported alcohol and marijuana use 30 days prior to their last arrest. This was accomplished by using a multiple regression analysis that forced the model to contain all of the ADSI domains, even if they no longer significantly
Table 11

Stepwise Regression Model Summary

<table>
<thead>
<tr>
<th>Model</th>
<th>$R$</th>
<th>$R^2$</th>
<th>$R^2_{adj}$</th>
<th>$F$</th>
<th>$P$</th>
<th>$df_1$</th>
<th>$df_2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.50a</td>
<td>.25</td>
<td>.24</td>
<td>34.62</td>
<td>.000</td>
<td>1</td>
<td>103</td>
</tr>
</tbody>
</table>

a. Predictors: (Constant), Individual/Peer Domain

Table 12

Stepwise Regression: Coefficients for Final Model

<table>
<thead>
<tr>
<th>Model</th>
<th>$B$</th>
<th>$B$</th>
<th>$t$</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Constant)</td>
<td>.33</td>
<td>--</td>
<td>1.99</td>
<td>.05</td>
</tr>
<tr>
<td>Individual/Peer Domain</td>
<td>.05</td>
<td>.50</td>
<td>5.88</td>
<td>.00</td>
</tr>
</tbody>
</table>

a. Dependent Variable: 30-day Substance Use
contributed to the regression equation. The ADSI domains were entered into the regression equation in the following order: School, Family, Community and Individual/Peer. Initial regression results indicated that the full ADSI model predicted substance use severity ($R^2 = .16, R^2_{adj} = .13, F(4,112) = 2.47, p < .001$). This particular regression model accounted for 16% of the variance in participants' substance use severity. A summary of the regression model, including each step within the analysis, is presented in Table 13.

However, even though this regression model was deemed significant, the Individual/Peer domain was the only variable that provided a significant contribution to the regression equation when all four ADSI domains were entered into the equation. The remaining ADSI domains, although still included in the model, were not significant. These results, including the regression coefficients and $p$-values, are presented in Table 14. It should also be noted that these results supported the findings presented in the stepwise regression analysis above.

Table 13

Regression Model Summary for All ADSI Domains

<table>
<thead>
<tr>
<th>Model</th>
<th>$R$</th>
<th>$R^2$</th>
<th>$R^2_{adj}$</th>
<th>$F$</th>
<th>$P$</th>
<th>df1</th>
<th>df2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.25a</td>
<td>.06</td>
<td>.06</td>
<td>7.78</td>
<td>.01</td>
<td>1</td>
<td>115</td>
</tr>
<tr>
<td>2</td>
<td>.27b</td>
<td>.07</td>
<td>.06</td>
<td>4.36</td>
<td>.02</td>
<td>2</td>
<td>114</td>
</tr>
<tr>
<td>3</td>
<td>.30c</td>
<td>.09</td>
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<td>2.47</td>
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a. Predictors: (Constant), School Domain  
b. Predictors: (Constant), School Domain, Family Domain  
c. Predictors: (Constant), School Domain, Family Domain, Community Domain  
d. Predictors: (Constant), School Domain, Family Domain, Community Domain, Individual/Peer Domain
Table 14

Coefficients for Final Model for All ADSI Domains

<table>
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<td>.04</td>
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<td></td>
<td>.04</td>
<td>.37</td>
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Dependent Variable: 30-day Substance Use

Research Question 3: Convergent Validity of the ADSI

Pearson’s product-moment correlation coefficients were computed to answer the third research question, “What is the convergent validity of the ADSI in relation to other measures and variables, including the antisocial behavior scale from the National Youth Survey (Huzinga & Elliot, 1986) and additional demographic variables?” The four ADSI domain scores and total score were correlated with the total score from the antisocial behavior scale from the National Youth Survey (Huzinga & Elliot, 1986). As performed by Corrigan and colleagues (2007), the convergent construct validity criteria set prior to the study was a correlation of \( r = .50 \). Two of the ADSI domains (Individual/Peer, \( r = \)
.68, \( p < .000 \); Community, \( r = .57, p < .000 \) and ADSI total score (\( r = .68, p < .000 \) met the criteria, and two of the ADSI domains did not (School, \( r = .43, p < .000 \); Family, \( r = .41, p < .000 \)). However, it should be noted that each of these associations were significant despite not meeting the cut-off criteria. Overall, these results indicated that the Individual/Peer and Community domains as well as the ADSI total score were more strongly associated with the antisocial behavior measure in comparison to the School and Family domains. In addition, results indicated the antisocial behavior scale was significantly correlated with other antisocial behavior including number of times arrested (\( r = .50, p < .01 \)) and age at first arrest (\( r = -.33, p < .01 \)). This indicated that scores on the antisocial behavior scale increased with participants who had more arrests and were first arrested at a younger age. All correlation coefficients are presented in Table 15.

The ADSI domains, ADSI total score and antisocial behavior scale score were also correlated with other demographic variables. For instance, the number of arrests was associated with all of the ADSI domains (Individual/Peer: \( r = .39, p < .00 \), Community: \( r = .43, p < .00 \), School: \( r = .25, p < .01 \), Family: \( r = .24, p < .009 \) and ADSI total score (\( r = .41, p < .00 \)) while age of first arrest was associated with the Individual/Peer (\( r = -.20, p < .037 \), Community (\( r = -.23, p < .01 \)) and ADSI total score (\( r = -.25, p < .01 \)). Age of initiation for marijuana was associated with the Individual/Peer domain (\( r = .25, p < .01 \), while age of initiation of alcohol was associated with both the Individual/Peer domain (\( r = .26, p < .01 \)) and the ADSI total score (\( r = .20, p < .03 \)). This finding suggested age of initiation for marijuana use might be most influenced by individual and peer factors, while age of initiation for alcohol is affiliated with individual and peer factors but also a combination of other risk factors (e.g., family, community and school). Regular alcohol
use was significantly associated with the Individual/Peer \((r = .35, p < .01)\) and Community \((r = .23, p < .05)\) domains as well as the total ADSI score \((r = .28, p < .01)\). This suggested that although individual and peer factors seem to influence initiation of alcohol use, a more complex combination of factors (e.g., family, community, and school factors) is associated with continued use. Also, participants who began using alcohol \((r = -.20, p < .05)\) or marijuana \((r = -.22, p < .05)\) at an early age were more likely to have attended substance use treatment, which, as previously noted, is a common finding in substance use research (Myner, et al., 1998; Sickmund, et al., 2008).

Similar to the second model CFA results presented above in Table 9, the ADSI domains were correlated with each other, although not as strongly, with correlation coefficients ranging from a low of \(r = .41 (p < .00)\) between the School and Family domains to a high of \(r = .60 (p < .00)\) between the Community and Individual/Peer domains. These values were similar to research suggesting that risk of substance use is associated with many factors, and thus, the ADSI domains would be moderately associated with each other. Also, all of the ADSI domains were moderately correlated with the ADSI total score \((r \geq .68, p < .00)\).
Table 15

Intercorrelations Between Antisocial Behavior Scale, ADSI Domains and Demographic Variables

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<td>2. Community Domain</td>
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<td>3. Family Domain</td>
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<td>.43**</td>
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<tr>
<td>4. Individual/Peer Domain</td>
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<td>.59**</td>
<td>.55*</td>
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<tr>
<td>5. School Domain</td>
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<td>.50**</td>
<td>.41**</td>
<td>.51**</td>
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<tr>
<td>6. Total ADSI Score</td>
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<td>.75**</td>
<td>.89**</td>
<td>.74**</td>
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<td></td>
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</tr>
<tr>
<td>7. # of Times Arrested</td>
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<td>.24**</td>
<td>.39**</td>
<td>.25**</td>
<td>.41**</td>
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<td>8. Head Injury</td>
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<td>.25**</td>
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<td>-.22*</td>
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<tr>
<td>11. Age of Initiate Alcohol</td>
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<td>.03</td>
<td>.26**</td>
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<td>.20*</td>
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<td>-.06</td>
<td>-.20*</td>
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<td>.41**</td>
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<td>-.17</td>
<td>-.19*</td>
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<td>.25**</td>
<td>-.59**</td>
<td>.01</td>
<td>-.01</td>
<td>.06</td>
<td>.18</td>
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</table>

* = p < .05, ** = p < .01
CHAPTER 4

DISCUSSION

This study analyzed the factor structure of the Adolescent Domain Screening Inventory (ADSI) with a sample of 121 juvenile offenders residing in four Utah observation and assessment (O&A) facilities. Participants completed the ADSI, a substance use history survey, a measure of delinquent behavior, and reported demographic information including the following variables: age, gender, race, age of onset for alcohol and drug use, prior experience with Utah Juvenile Justice Services, history of head injury, previous participation in substance abuse treatment, and history of mental health diagnoses.

In general, results provided support for a four-factor model of the ADSI consisting of the Individual/Peer, Family, School and Community domains originally proposed by Corrigan and colleagues (2007). Of these domains, the Individual/Peer domain was determined to significantly predict substance use severity among participants. Also, the ADSI domains were significantly correlated with the measure of delinquent behavior from the National Youth Study (Huizinga & Eliiot, 1986) and other above-mentioned variables, which provided support for the convergent validity of the ADSI. The remainder of this discussion will review these major findings in greater detail, highlight the limitations of the present study and provide recommendations for future research with the ADSI.
**Major Findings**

Research Question 1: Testing Model Fit of the ADSI

Two confirmatory factor analyses (CFA) were conducted to assess the factor structure of the ADSI. In particular, results from the second CFA supported the existence of a four-factor model consisting of the Individual/Peer, Family, School and Community domains as originally proposed by Corrigan and colleagues (2007). This finding provided support for the validity of the ADSI among juvenile offenders. This particular result was also important because it indicated the four-factor structure of the ADSI is maintained not only within the original sample proposed by Corrigan and colleagues (2007), consisting of adolescents from junior high and high schools in New York, but also a sample of incarcerated youth.

As previously discussed, the associations between the four general risk categories (Individual/Peer, Family, School and Community) and delinquent behavior have been well documented (Brook, et al., 1996; Catalano & Hawkins, 1996; Helstrom, et al., 2004; Prinz & Kerns, 2003; Wilson, et al., 2001). For instance, the Social Development Model (SDM) proposes three developmental pathways that incorporate risk and protective factors from the four domains to explain the development of delinquent behavior (Catalano & Hawkins, 1996). The SDM pathway for the high school period depicts how risk and protective factors from the Family, School and Community domains tend to provide an environment to support prosocial or delinquent behavior for adolescents, while factors from the Individual/Peer domain drive the development of delinquent behavior (Catalano & Hawkins, 1996). Specific Individual/Peer risk factors at this age period include interacting with peers who abuse alcohol and other drugs and exhibit
delinquent behavior, perceiving rewards from associating with these individuals, and finding value in delinquent behavior and associating with a negative peer group.

Previous longitudinal research conducted in the late 1980s and throughout the 1990s has also identified how the general four risk factors are predictive of adolescent substance use, delinquency, violence and school dropout (Dryfoos, 1990; Hawkins, Catalano, & Miller, 1992; Hawkins, et al., 1998; Lipsey & Derzon, 1998; Loeber & Stouthamer-Loeber, 1987; Mrazek & Haggerty, 1994). In 1998, the Office of Juvenile Justice and Delinquency Prevention (OJJDP) formed a study group consisting of 39 experts on child delinquency and child psychopathology to analyze existing data on chronic juvenile offenders and provide recommendations for future research and programming (OJJDP, 2003). This meeting resulted in the promotion of a risk and protective factor model to explain chronic juvenile offending, which consisted of the four domains also highlighted in the present study, and it included one addition – media (OJJDP, 2003).

This OJJDP study group also highlighted that no single risk factor specifically predicts or leads to delinquency, but instead, the likelihood of chronic juvenile offending tends to increase as the number of risk factors and risk domains increases (OJJDP, 2003). Other research has also noted the robust relationship between exposure to a number of risk factors and the increasing likelihood of many problem behaviors (Arthur, Hawkins, Pollard, Catalano, & Baglioni, 2002; Bry, McKeon & Pandina, 1982; Newcomb, 1995; Pollard, Hawkins, & Arthur, 1999; Rutter, 1979). Some have suggested that the number of risk factors present is a more powerful predictor of problem behavior as opposed to the specific risk factors present (Sameroff, Bartko, Baldwin, Baldwin, & Seifer. 1998). In
addition, more current research suggests that as risk factors are addressed in community-wide interventions, then problem behavior decreases (Hawkins, et al., 2012).

In the present study, there were also strong correlations between the four ADSI domains. These significant associations between the ADSI domains were expected because, as noted above, the majority of participants reported an extensive substance use history and history of delinquent behavior, and also indicated problems in other areas of their lives, including family relationships and academic performance (Arthur, et al., 2002; Dryfoos, 1990; Lipsey & Derzon, 1998). Thus, it is likely that the correlations between the ADSI domains would not have been as strong if the study sample had been more heterogeneous in terms of substance use history and history of delinquency. These associations also provided evidence for content validity of the ADSI, meaning that this screening instrument measures the constructs it was designed to assess.

Research Question 2: ADSI Domains and Substance Use Severity

Two regression analyses were conducted to assess which of the four domains of the ADSI would better predict level of alcohol and other drug use among participants. These analyses were important measures of predictive validity for the ADSI. Alternatively stated, it was necessary to assess whether the domains of the ADSI, or a specific ADSI domain, predicted substance use severity, as this screening instrument was designed to do (Corrigan, et al., 2007). The results from the first stepwise regression analysis indicated the Individual/Peer domain was the primary predictor of substance use severity among participants. The second regression analysis confirmed this finding and
also depicted how the School and Community domains significantly contributed to the regression equation until the Individual/Peer domain was added.

These findings were somewhat surprising, because it was assumed that each ADSI domain would explain at least some of the variance of substance use severity among participants since the ADSI domains were strongly correlated with each other. Also, it was expected that more ADSI domains would be included in the regression equation, because, as previously mentioned, as the number of risk factors and risk domains increase for an adolescent, the likelihood of delinquent behavior, including substance use, increases (Arthur, et al., 2002; Bry, McKeon & Pandina, 1982; Newcomb, 1995; Pollard, et al., 1999; Rutter, 1979). However, previous research and theory also support the Individual/Peer domain being the primary predictor of substance use severity among juvenile offenders (Catalano & Hawkins, 1996; Mauricio, et al., 2008; Patterson, Crosby, & Vuchinich, 1992; Patterson, Forgatch, Yoerger, & Stoolmiller, 1998). As previously mentioned, the SDM pathway for the high school age period suggests that perceived rewards, beliefs and values associated with interacting with deviant and substance-using peers tends to drive the development of delinquent behavior, including substance use (Catalano & Hawkins, 1996). Other factors within the Community, Family and School domains were more significant during earlier developmental periods when children and preadolescents are more dependent on others to care for them and have less independence in general (Catalano & Hawkins, 1996).

Previous research also supports the importance of Family, Community and School risk factors during early childhood and Individual/Peer factors on substance use during adolescence. For instance, in their studies on predictors of delinquent behavior, Patterson
and colleagues determined delinquent behavior was best predicted by age of first arrest, which included substance use-related charges, in comparison to family social disadvantage, parental monitoring and parental discipline (Patterson et al., 1992; Patterson, et al., 1998). Long-term results also indicated that those who were first arrested prior to age 13 were more likely to be chronic offenders by age 18. More recently, a large study assessed prospective model trajectories of substance use among 1,095 male serious juvenile offenders after controlling for time spent in a supervised setting, such as detention (Mauricio, et al., 2008). The primary result provided support for the use of supervised settings; however, additional findings indicated that risk and protective factors from the four above-mentioned domains assessed within the study influenced initial substance use behavior, but only adolescent history of substance use, impulse control and psychosocial maturity had an effect on change in substance use over time. Somewhat similarly, in a study examining a developmental cascade model depicting the development of poor health risks, mental health problems and service use among adults, findings indicated conduct problems and family adversity between the ages of 10 to 12 predicted risk taking, substance use and internalizing behavior during adolescence, which in turn predicted adult outcomes of conduct problems, health issues, depression and service use (Herrenkohl, et al., 2010).

The results from the studies described above highlight how a variety of individual and peer risk factors contribute to substance use severity among adolescents and, more specifically, juvenile offenders. This combination of findings may help in explaining why the Individual/Peer domain only accounted for 25% of the variance for substance use severity among participants in the present study. Although this result was significant, it
suggests that other factors, that possibly were not included in the present analyses also contributed to substance use severity among participants. For instance, the ADSI does not account for individual and peer factors such as cognitive development, hyperactivity and emotional factors (depression, anger) that are highlighted in other research studies analyzing risk and protective factors (Arthur, et al., 2002; Hawkins, et al., 1992; OJJDP, 2003). The studies above also mention individual and peer factors such as impulsivity and psychosocial maturity, which are also not measured in the ADSI (Herrenkohl, et al., 2010; Mauricio, et al., 2008). Thus, it is easy to see how a variety of risk factors within one risk domain can explain substance use severity, and how research and results may promote certain domains and specific risk factors.

Research Question 3: Convergent Validity of the ADSI

Pearson’s product-moment correlation coefficients were computed to assess the convergent validity of the ADSI in relation to other measures and variables, including the antisocial behavior scale from the National Youth Survey (Huzinga & Elliot, 1986) and additional demographic variables. Overall, correlations between the ADSI domains, ADSI total score and variables measuring delinquent behavior provided support of convergent validity for the ADSI, or in other words, constructs within the ADSI (e.g., the ADSI domains and total score) were associated as expected with a measure of delinquent behavior. For instance, significant associations were identified between the Individual/Peer and Community domains, the ADSI total score and the antisocial behavior scale, which met the previously determined cut-off score as suggested by Corrigan and colleagues (2007) in their original study. Associations between the
antisocial behavior scale and the School and Family domains were moderate and significant, but did not reach the previously determined cut-off score.

In general, these results are important because they provide further support for the findings mentioned above and also are reflective of previous research on juvenile offenders and risk and protective factors. To briefly reiterate, prior research has documented that an increase in risk factors and risk domain is associated with an increase in likelihood of juvenile offending (Arthur, et al., 2002; Bry, et al., 1982; Newcomb, 1995; OJJDP, 2003; Pollard, et al., 1999; Rutter, 1979). Thus, it would be expected that all of the ADSI domains would be at least moderately correlated with a measure of delinquent behavior, given that the sample of the present study consists of juvenile offenders, and as noted before, the strong association between delinquent behavior and substance use severity has been well documented (Catalano & Hawkins, 1996; Prinz & Kerns, 2003; Wilson, et al., 2001). Since the Individual/Peer domain of the ADSI was found to predict substance use severity among participants in the regression analyses described above, it is not surprising that this domain is also significantly associated with the antisocial behavior measure. The Community domain of the ADSI was not found to predict substance use severity in the regression analyses above, but it was significantly associated with the antisocial behavior measure and met the cut-off criteria. This result may suggest that the Community domain may be more reflective of delinquent behavior in general as opposed to substance use severity. This proposition is supported by the SDM, which indicates that risk factors from both the Individual/Peer and Community domains contribute to general delinquent behavior during adolescence (Catalano & Hawkins, 1996).
It should be noted that in the Corrigan et al., (2007) study, the correlation between the total ADSI score and the antisocial behavior scale did not achieve the proposed cut-off score, while in the present study, the total ADSI score and antisocial behavior scale had a stronger positive correlation and met the cut-off criteria. This stronger correlation is to be expected, given that the sample in the original Corrigan and colleagues (2007) study consisted of a more heterogeneous population with likely a more limited criminal history in comparison to the present sample of participants in Utah Juvenile Justice Service programming. As Corrigan and colleagues (2007) mentioned, the ADSI was designed to be a substance use disorder screening measure and not a measure of antisocial behavior, and thus, it would be expected that the ADSI would have a stronger association with substance use-related measures. However, the stronger association between the ADSI and the antisocial behavior measure in the present study is reflective of previous research indicating an association between substance use and delinquent behavior (Prinz & Kearns, 2003; Wilson, et al., 2001), and also provides evidence that the ADSI may be able to differentiate adolescents who are at risk for developing a substance use disorder from those who may already have a substance use disorder.

Other evidence was also found to support the association between the ADSI and delinquent behavior. The ADSI total score was moderately and positively correlated with the number of arrests among participants, indicating the more arrests participants had incurred, the higher their ADSI total score. Also, the ADSI total score was moderately and negatively correlated with age of first arrest among participants. This association suggests that the younger participants were when they were first arrested, the more significant their risk of substance use as indicated by the ADSI total score. Both of these
results reflect findings from previous research discussed in the sections above and the literature review, suggesting age of initiation of substance use or delinquent behavior is strongly associated with severity of problem behavior during adolescence (Herrenkohl, et al., 2010; Jenson, et al., 2001; Mauricio, et al., 2008; Patterson, et al., 1992; Patterson, et al., 1998; Prinz & Kearns, 2003).

Other associations between the ADSI domains, ADSI total score and additional study variables, provided further support for the overall validity of the ADSI. The Individual/Peer domain was moderately and positively correlated with age of initiation of alcohol and marijuana use, while both the Individual/Peer and Community domains were significantly associated with regular alcohol use among participants. These associations are reflective of previous research suggesting that individual (e.g., genetics, self-esteem, perception of substance use) and peer factors (e.g., peers who use alcohol or other drugs) influence whether or not an adolescent initiates substance use (Hawkins & Catalano, 1992; OJJDP, 2003). Additionally, in order to continue using alcohol regularly, an adolescent would need to reside in a community where it was easy to obtain alcohol and where the community had a more accepting attitude and practices that promoted regular alcohol use among adolescents (D’Amico, Ellickson, Collins, Martino, & Klein 2005; Hawkins & Catalano, 1992; OJJDP, 2003). Both of these findings are reflective of the SDM pathway for substance use and delinquent behavior during adolescence as described in detail in other sections of this chapter (Catalano & Hawkins, 1996). Finally, age of initiation of alcohol and other drugs was associated with previous participation in substance use treatment, a finding that is well documented in previous research literature (Myner, et al., 1998; Sickmund, et al., 2008). Adolescents who initiate the use of alcohol
and other drugs at an early age have a greater likelihood of using these substances on a regular basis, which in turn, can lead them to develop a substance use disorder and eventually receive a referral to substance abuse treatment.

**Limitations and Recommendations**

A study of this nature has limitations, which requires interpreting the study results with some caution and speculation while also emphasizing the need for further research of the ADSI prior to utilizing this screening measure in a juvenile justice setting. The two primary limitations to the present study are highlighted in this section and recommendations for addressing these limitations in future research are also provided.

**Sample Size and Homogeneity**

First, the most significant limitation within this study was the small sample size. Originally, this study was designed to have 300 participants complete the study questionnaire because this is the recommended sample size for conducting a CFA with adequate power (Kline, 2005). Because of the smaller sample size (121 participants), item parcels were generated in order to conduct a CFA that met the minimum item-to-participant ratio requirements (Kline, 2005). The research literature on using item parcels in a CFA to compensate for a smaller sample size is inconclusive (Bagozzi & Edwards, 1998; Bagozzi & Heatherton, 1994; Brown, 2006; Nasser & Takahashi, 2003; Schallow, 2000). Some researchers note the need for this methodology when assessing populations that pose challenges for data collection (Schallow, 2000), as further explained below, while others state that this methodology significantly influences CFA results and should be used with extreme caution or not at all (Brown, 2006). Thus, for this study, item
parcels were utilized in order to conduct a CFA and results were interpreted generally and with caution, with the understanding that this study will need to be replicated with a larger sample size in the future in order to further validate the ADSI.

The small sample size in this study can be attributed to a variety of factors. For instance, there was difficulty obtaining parental consent at the parent orientation meetings. It is possible that parents of some of the prospective participants did not attend the initial parent orientation meeting where participant recruitment occurred, and others who did attend these meetings declined to participate, possibly believing that the information their child disclosed would be used against them. Because study recruitment occurred at the initial parent meeting, limited time was available to develop a positive and trusting relationship with potential participants and their parents, which likely affected recruitment and the final sample size.

In addition, multiple staff members from Utah Juvenile Justice Services (JJS) were involved in participant recruitment and administering the questionnaire. It appeared that some facilities had more staff members and interest in assisting with this study in comparison to other facilities. This was especially apparent when comparing urban and rural facilities. Rural facilities may have had more difficulty recruiting participants for this study because these facilities are smaller, with fewer prospective participants, and were more understaffed than facilities located in an urban setting. Also, the rural facilities seemed to have a higher staff turnover, making it more difficult to establish a relationship with the facility director and to train staff members to obtain parental consent, recruit participants and administer the study questionnaire.
Similar limitations have been documented in previous research studies conducted in juvenile justice settings (Dashiff, 2001; Gans & Brindis, 1995). More specifically, researchers have noted it is often difficult to navigate the hierarchy within juvenile justice programs to obtain permission to conduct research, because juvenile justice services, similar to other organizations, have their own language and system for accomplishing tasks (Gans & Brindis, 1995). Additionally, some correctional facilities and institutional review boards require the researcher to obtain active parental consent from parents, while others allow the state to provide consent since they have custody of youth while they participate in juvenile justice programming (Gans & Brindis, 1995). Once permitted to conduct the research, scheduling difficulties can arise because facilities will often schedule field trips, invite community speakers to present or be placed on mandatory lock-down without giving notice to the research team, which impedes completing data collection in a timely manner (Gans & Brindis, 1995). Finally, national reports indicate that juvenile justice services programs have a history of being overcrowded and understaffed (Rubin, 2009). For instance, in a recent report the Ventura Youth Correctional Facility stated they were operating at 301% capacity because of a hiring freeze and closing of another youth correctional facility, resulting in everyone feeling “overcrowded and understaffed” (CJCJ, 2010). Thus, it is understandable why some juvenile justice administrators and staff would feel overwhelmed in assisting with a research study when they are already having difficulty completing their required duties.

Another limitation within the study was the homogeneity among participants. Juvenile offenders were originally selected as the study population because of the strong correlation between substance use and delinquent behavior among adolescents (Loeber,
et al., 1999; Stice, Myers, & Brown, 1998; Stoiber & Good, 1998). It was important to have participants with a history of substance use because the ADSI was designed to screen for individuals who were, at a minimum, at-risk for developing a substance use disorder (Corrigan et al., 2007). It became apparent during data analysis that having a study sample with an extensive substance use history decreased the data variability, which in turn, likely influenced the study results and made data interpretation more limited than if the study sample had included both juvenile offenders and adolescents from the general community.

Given these study limitations, it is imperative that the validity of the ADSI be further analyzed prior to incorporating this screening measure in assessment batteries and treatment programming with juvenile justice settings. The ADSI should be administered to a larger sample of adolescents consisting of at least 300 participants to conduct a CFA with adequate power (Kline, 2005). In addition, collaboration should occur with juvenile justice services personnel to determine how best to recruit participants, obtain parental or state consent, and administer the ADSI and possibly other study questionnaires (Dashiff, 2001). It is imperative that the principal investigator and research staff collaborate effectively with juvenile justice services personnel to collect data without overburdening staff and resources. The recommended sample size could also be achieved by administering the ADSI to youth in a variety of settings besides juvenile justice facilities such as junior high and high schools, substance use treatment facilities, after-school programs, youth centers and juvenile justice facilities. Steps should be taken to ensure that adolescents from both rural and urban settings are included in future studies utilizing the ADSI because substance use and the interaction between risk and protective factors
may differ due to location of residence (Wilson & Donnermeyer, 2006). For instance, adolescents in urban settings may have easier access to substance use prevention and treatment programming (Scaramella & Keyes, 2001).

Also, both content and convergent validity of the ADSI should be assessed in future research. This could be accomplished by also administering comprehensive mental health measures during the study such as the Jesness Inventory Revised (Jesness & Wedge, 1984) to assess delinquent behavior and the Problem-Oriented Screening Instrument for Teenagers (POSIT; Rahdert, 1991) for substance use while possibly including other instruments to assess variables such as school performance and family functioning. While including more assessment measures will cause the study to become more complex, doing so will provide a more comprehensive understanding of each ADSI domain and how each domain influences substance use severity.

Self-Report

The final major limitation with the present study involves participant self-report. All study results were based on participant self-report, which, as discussed in the literature review, can be problematic, as some research suggests adolescents tend to over-report and under-report substance use and other problem behavior (Bailey, et al., 1992; Brener, et al., 2003; Single, et al., 1975; Winters, et al., 2001). Only one item in the study questionnaire assessed validity of self-report in the present study. Attempts were also made to assist participants in feeling as if the information they provided was confidential and would not be used against them while in juvenile justice programming by having participants place study questionnaires in sealed envelopes (Winters, et al., 2001). However, despite these efforts, it is possible that some participants provided invalid
information about certain behaviors and information (e.g., demographic information, personal perspectives) which were not identified during data collection and data cleaning, causing this information to be included in study analyses.

Future research with the ADSI should include other measures to assess validity of participants’ self-report. For instance, participants could be required to provide a urine sample for urinalysis, or collateral information such as court documents or information from parents or caseworkers could be collected (Brener, et al., 2003). Another method to improve self-report would be to incorporate interview formats to gather information about participants’ substance use history. One of the most common and well-documented formats is the Timeline Follow Back (TLFB), which quantifies specific amounts of alcohol or other drugs consumed by individuals during a specified time period (Sobell & Sobell, 1992). Research with adolescents, including juvenile offenders, has indicated the TLFB method is reliable and produces data that correspond with biological markers and collateral report of adolescent substance use (Donahue, et al., 2004; Waldron, Slesnick, Brody, Turner, & Peterson, 2001).

Also, since validity of self-report is influenced by ability to understand the items within the study questionnaire (Brener, et al., 2003; Winters, et al., 2001), it is imperative to pilot test the ADSI and other measures with adolescents prior to conducting a larger study to ensure that the questionnaire items make sense and reflect participants’ current vernacular and environment. This is especially important for participants in juvenile justice settings, who will need to be informed whether they should provide information about their current behavior or behavior prior to their arrest and subsequent incarceration.
**Strengths**

Despite the limitations of the present study, there were some strengths within the results. For instance, the ADSI had been designed using archival data and had not been administered in a prospective format (Corrigan et al., 2007). Results from the present study exhibited evidence for the validity and utility of using the ADSI with adolescents, particularly those in a juvenile justice setting. In addition, the original sample used to design the ADSI was limited in diversity, whereas the present study sample was much more diverse and provided evidence for the utility of the ADSI among adolescents from a variety of racial and ethnic backgrounds (Corrigan et al., 2007). Finally, there are no current screening instruments that identify underlying risk and protective factors associated with substance abuse nor are there any measures that identify youth who are at-risk for substance use disorders (Winters, 1999). Results from the present study provided support that this measure, with more research, has the potential to do both.

**Clinical Implications**

The results of the present study not only provided support for the validity of the ADSI among juvenile offenders, but also for the utility of using this screening instrument in juvenile justice settings. As mentioned previously, juvenile justice settings in Utah and nationally tend to use comprehensive assessment measures in their assessment batteries to measure substance use and other problem behavior, as well as mental health, academic and familial issues (John DeWitt, personal communication, September 9th, 2009; Snyder & Sickmund, 2006). Although these modes of assessment are beneficial in establishing diagnoses and treatment planning, they can also be time-consuming and costly (Winters, 1999). Incorporating a brief screening instrument that can quantify level of risk for a
variety of risk domains, such as the ADSI, could help dictate which comprehensive assessment measures need to be administered. Also, if further research suggests that the ADSI is predictive of substance use severity, it is possible this measure could replace measures such as the Substance Abuse Subtle Screening Inventory for Adolescents (Miller & Lazowski, 2001) in some cases. In addition, adolescents residing in juvenile justice settings may prefer to complete the ADSI as opposed to another more comprehensive measure because the ADSI only consists of 33 items, while other comprehensive measures contain more than 100 items (e.g., Teen Addiction Severity Index; Kaminer, Bukstein & Tarter, 1991). Using a shorter screening instrument would also be easier to score than a more comprehensive measure, which would be more efficient in juvenile justice settings, which have a history of being understaffed.

Further research needs to be conducted to assess both the validity and utility of the ADSI before it is implemented in an assessment battery in juvenile justice settings and possibly school settings. As already mentioned, the ADSI should be administered to a larger and more heterogeneous sample of adolescents in terms of substance use history and history of delinquent behavior to validate this measure. Participants’ responses should be compared to their responses on other assessment instruments to assess for content and convergent validity. Finally, Corrigan and colleagues (2007) initially proposed cut-off scores for the ADSI, which were not measured in the present study. It would be helpful to further assess these cut-off scores in the future in order to determine whether the ADSI can differentiate between youth who are not at risk, or are at-risk, or at high risk for developing a substance use disorder.
Summary

Adolescents are likely to experiment with alcohol, marijuana and possibly other drugs (Johnston, et al., 2011). Although most of this use is experimental, some youth are more likely to use these substances regularly and possibly develop a substance use disorder (SAMHSA, 2006). Juvenile offenders are especially at risk for developing a substance use disorder due to the strong association between delinquent behavior and alcohol and other drug use (Loeber, et al., 1999; Stice, et al., 1998; Stoiber & Good, 1998). Various forms of assessment are employed by substance abuse treatment agencies, hospitals and youth centers to identify youth who are in need of substance use treatment or other preventive interventions (Winters, 2003). The ADSI is a screening instrument that was designed to identify adolescents who are at risk for developing a substance use disorder while considering the underlying risk and protective factors associated with substance use and other problem behavior (Corrigan, et al., 2007; Hawkins & Catalano, 1996). The present study assessed the validity of the ADSI among a small sample of juvenile offenders. Results provided some evidence for using this screening measure in a juvenile justice setting; however, further research should be conducted to validate this screening instrument.
Participant ID: _____________________________

Instructions: Please read the following questions carefully. For each question, fill in the bubble next to your answer. Remember to choose only one answer.

1. Are you:
   ○ Male   ○ Female

2. How old are you?
   ○ 12 years ○ 13 years ○ 14 years ○ 15 years ○ 16 years ○ 17 years ○ 18 years

3. Please choose the one answer that best describes your race/ethnicity:
   ○ White, not of Hispanic origin ○ Black, or African American
   ○ Asian ○ American Indian/Native American,
   Eskimo, or
   ○ Spanish/Hispanic/Latino ○ Aleut
   ○ Pacific Islander ○ Other (Please specify_____________)

4. What grade are you in school?
   ○ 6th grade ○ 7th grade ○ 8th grade ○ 9th grade ○ 10th grade ○ 11th grade
   ○ 12th grade

5. How old were you when you first:
   a. Smoked marijuana?
      ○ Never ○ 10 years old or younger ○ 11 ○ 12 ○ 13 ○ 14 ○ 15 ○ 16 ○ 17
      years old
   
   b. Smoked a cigarette, even just a puff?
      ○ Never ○ 10 years old or younger ○ 11 ○ 12 ○ 13 ○ 14 ○ 15 ○ 16 ○ 17
      years old
c. Had more than a sip or two of beer, wine, or hard liquor (vodka, whiskey, or gin)?
   ○ Never ○ 10 years old or younger ○ 11 ○ 12 ○ 13 ○ 14 ○ 15 ○ 16 ○ 17 years old

d. Began drinking alcoholic beverages regularly, that is, at least once or twice a month?
   ○ Never ○ 10 years old or younger ○ 11 ○ 12 ○ 13 ○ 14 ○ 15 ○ 16 ○ 17 years old

6. Have you ever been arrested?
   ○ Yes ○ No
   a. If you answered “yes,” how old were you when you were first arrested?
      ○ 10 years old or younger ○ 11 ○ 12 ○ 13 ○ 14 ○ 15 ○ 16 ○ 17 ○ 18 years old
   b. If you answered “yes,” how many times have you been arrested?
      ○ 1 time ○ 2 times ○ 3-5 times ○ 6-8 times ○ 9-12 times ○ 13-15 times ○ 16+ times

7. Have you ever had a concussion or other type of major head injury?
   ○ Yes ○ No

8. Have you ever attended counseling because of problems with alcohol or drugs?
   ○ Yes ○ No

9. Have you ever been diagnosed with anything by a doctor?
   ○ Yes ○ No
   a. If you answered “yes,” what was your diagnosis? Please answer in the space below.
10. Have you ever used smokeless tobacco (chew, dip, snuff)?
   ○ Yes  ○ No

11. How many times did you use smokeless tobacco 30 days before your last arrest?
   ○ Never  ○ 1-2  ○ 3-5  ○ 6-10  ○ 11-19  ○ 20-29  ○ 30-39  ○ 40+ times

12. Have you ever smoked cigarettes?
   ○ Yes  ○ No

13. How many times did you smoke cigarettes 30 days before your last arrest?
   ○ Never  ○ 1-2  ○ 3-5  ○ 6-10  ○ 11-19  ○ 20-29  ○ 30-39  ○ 40+ times

14. How many times in your lifetime have you drank alcohol?
   ○ Never  ○ 1-2  ○ 3-5  ○ 6-10  ○ 11-19  ○ 20-29  ○ 30-39  ○ 40+ times

15. How many times did you drink alcohol 30 days before your last arrest?
   ○ Never  ○ 1-2  ○ 3-5  ○ 6-10  ○ 11-19  ○ 20-29  ○ 30-39  ○ 40+ times

16. How many times did you have five or more drinks of alcohol at a time 2 weeks before your last arrest?
   ○ Never  ○ 1-2  ○ 3-5  ○ 6-10  ○ 11-19  ○ 20-29  ○ 30-39  ○ 40+ times

17. How many times in your lifetime have you used marijuana (weed, pot, dope)?
   ○ Never  ○ 1-2  ○ 3-5  ○ 6-10  ○ 11-19  ○ 20-29  ○ 30-39  ○ 40+ times

18. How many times did you use marijuana (weed, pot, dope) 30 days before your last arrest?
   ○ Never  ○ 1-2  ○ 3-5  ○ 6-10  ○ 11-19  ○ 20-29  ○ 30-39  ○ 40+ times

19. How many times in your lifetime have you used inhalants (sniff, huff, whippets, poppers)?
   ○ Never  ○ 1-2  ○ 3-5  ○ 6-10  ○ 11-19  ○ 20-29  ○ 30-39  ○ 40+ times
20. How many times did you use inhalants (sniff, huff, whippets, poppers) 30 days before your last arrest?
○ Never ○ 1-2 ○ 3-5 ○ 6-10 ○ 11-19 ○ 20 -29 ○ 30-39 ○ 40+ times
21. How many times in your lifetime have you used hashish (hash, shish, nup)?
○ Never ○ 1-2 ○ 3-5 ○ 6-10 ○ 11-19 ○ 20 -29 ○ 30-39 ○ 40+ times
22. How many times did you use hashish (hash, shish, nup) 30 days before your last arrest?
○ Never ○ 1-2 ○ 3-5 ○ 6-10 ○ 11-19 ○ 20 -29 ○ 30-39 ○ 40+ times
23. How many times in your lifetime have you used LSD (acid, blotter)?
○ Never ○ 1-2 ○ 3-5 ○ 6-10 ○ 11-19 ○ 20 -29 ○ 30-39 ○ 40+ times
24. How many times did you use LSD (acid, blotter) 30 days before your last arrest?
○ Never ○ 1-2 ○ 3-5 ○ 6-10 ○ 11-19 ○ 20 -29 ○ 30-39 ○ 40+ times
25. How many times in your lifetime have you used amphetamines (meth, uppers, speed)?
○ Never ○ 1-2 ○ 3-5 ○ 6-10 ○ 11-19 ○ 20 -29 ○ 30-39 ○ 40+ times
26. How many times did you use amphetamines (meth, uppers, speed) 30 days before to your last arrest?
○ Never ○ 1-2 ○ 3-5 ○ 6-10 ○ 11-19 ○ 20 -29 ○ 30-39 ○ 40+ times
27. How many times in your lifetime have you used cocaine (coke, blow, snow)?
○ Never ○ 1-2 ○ 3-5 ○ 6-10 ○ 11-19 ○ 20 -29 ○ 30-39 ○ 40+ times
28. How many times did you use cocaine (coke, blow, snow) 30 days before your last arrest?
○ Never ○ 1-2 ○ 3-5 ○ 6-10 ○ 11-19 ○ 20 -29 ○ 30-39 ○ 40+ times
29. How many times in your lifetime have you used crack (freebase, rooster)?
○ Never ○ 1-2 ○ 3-5 ○ 6-10 ○ 11-19 ○ 20 -29 ○ 30-39 ○ 40+ times
30. How many times did you use crack (freebase, rooster) 30 days before your last arrest?
   ○ Never  ○ 1-2  ○ 3-5  ○ 6-10  ○ 11-19  ○ 20-29  ○ 30-39  ○ 40+ times

31. How many times in your lifetime have you used ecstasy (X, E, MDMA)?
   ○ Never  ○ 1-2  ○ 3-5  ○ 6-10  ○ 11-19  ○ 20-29  ○ 30-39  ○ 40+ times

32. How many times did you use ecstasy (X, E, MDMA) 30 days before your last arrest?
   ○ Never  ○ 1-2  ○ 3-5  ○ 6-10  ○ 11-19  ○ 20-29  ○ 30-39  ○ 40+ times

33. How many times in your lifetime have you used steroids (roids, juice)?
   ○ Never  ○ 1-2  ○ 3-5  ○ 6-10  ○ 11-19  ○ 20-29  ○ 30-39  ○ 40+ times

34. How many times did you use steroids (roids, juice) 30 days before your last arrest?
   ○ Never  ○ 1-2  ○ 3-5  ○ 6-10  ○ 11-19  ○ 20-29  ○ 30-39  ○ 40+ times

35. How many times in your lifetime have you used heroin (smack, Big H, horse)?
   ○ Never  ○ 1-2  ○ 3-5  ○ 6-10  ○ 11-19  ○ 20-29  ○ 30-39  ○ 40+ times

36. How many times did you use heroin (smack, Big H, horse) 30 days before your last arrest?
   ○ Never  ○ 1-2  ○ 3-5  ○ 6-10  ○ 11-19  ○ 20-29  ○ 30-39  ○ 40+ times

37. How many times in your lifetime have you used other narcotics (painkillers, cough medicine) that were not prescribed by your doctor?
   ○ Never  ○ 1-2  ○ 3-5  ○ 6-10  ○ 11-19  ○ 20-29  ○ 30-39  ○ 40+ times

38. How many times did you use other narcotics (painkillers, cough medicine) that were not prescribed by your doctor 30 days before your last arrest?
   ○ Never  ○ 1-2  ○ 3-5  ○ 6-10  ○ 11-19  ○ 20-29  ○ 30-39  ○ 40+ times

39. How many times in your lifetime have you used nariam?
   ○ Never  ○ 1-2  ○ 3-5  ○ 6-10  ○ 11-19  ○ 20-29  ○ 30-39  ○ 40+ times
40. How many times did you use nariam 30 days before your last arrest?
○ Never ○ 1-2 ○ 3-5 ○ 6-10 ○ 11-19 ○ 20-29 ○ 30-39 ○ 40+ times

41. How many times in your lifetime have you used depressants (Valium, downers, sleeping pills)?
○ Never ○ 1-2 ○ 3-5 ○ 6-10 ○ 11-19 ○ 20-29 ○ 30-39 ○ 40+ times

42. How many times did you use depressants (Valium, downers, sleeping pills) 30 days before your last arrest?
○ Never ○ 1-2 ○ 3-5 ○ 6-10 ○ 11-19 ○ 20-29 ○ 30-39 ○ 40+ times

43. How many times in the past 12 months have you been suspended from school?
○ Never ○ 1-2 ○ 3-5 ○ 6-10 ○ 11-19 ○ 20-29 ○ 30-39 ○ 40+ times

44. How many times in the past 12 months have you carried a handgun?
○ Never ○ 1-2 ○ 3-5 ○ 6-10 ○ 11-19 ○ 20-29 ○ 30-39 ○ 40+ times

45. How many times in the past 12 months have you sold illegal drugs?
○ Never ○ 1-2 ○ 3-5 ○ 6-10 ○ 11-19 ○ 20-29 ○ 30-39 ○ 40+ times

46. How many times in the past 12 months have you stolen a vehicle?
○ Never ○ 1-2 ○ 3-5 ○ 6-10 ○ 11-19 ○ 20-29 ○ 30-39 ○ 40+ times

47. How many times in the past 12 months have you been arrested?
○ Never ○ 1-2 ○ 3-5 ○ 6-10 ○ 11-19 ○ 20-29 ○ 30-39 ○ 40+ times

48. How many times in the past 12 months have you attacked to hurt?
○ Never ○ 1-2 ○ 3-5 ○ 6-10 ○ 11-19 ○ 20-29 ○ 30-39 ○ 40+ times

49. How many times in the past 12 months have you been drunk or high at school?
○ Never ○ 1-2 ○ 3-5 ○ 6-10 ○ 11-19 ○ 20-29 ○ 30-39 ○ 40+ times

50. How many times in the past 12 months have you taken a handgun to school?
○ Never ○ 1-2 ○ 3-5 ○ 6-10 ○ 11-19 ○ 20-29 ○ 30-39 ○ 40
Adolescent Domain Screening Inventory (ADSI)

<table>
<thead>
<tr>
<th>These questions ask about the neighborhood and community where you live.</th>
<th>NO!</th>
<th>no</th>
<th>yes</th>
<th>YES!</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. If a kid smoked marijuana in your neighborhood would he or she be caught by the police?</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2. I like my neighborhood</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>3. There are people in neighborhood who are proud of me when I do something well.</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>4. How much does the following statement describe your neighborhood: crime and/or drug selling.</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>5. Are service clubs available in your community for people your age?</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>6. How wrong would most adults in your neighborhood think it was for kids your age to use marijuana?</td>
<td>Very Wrong</td>
<td>Wrong</td>
<td>A Little Bit Wrong</td>
<td>Not Wrong At All</td>
</tr>
<tr>
<td>7. If you wanted to get some marijuana, how easy would it be for you to get some?</td>
<td>Very Hard</td>
<td>Sort Of Hard</td>
<td>Sort Of Easy</td>
<td>Very Easy</td>
</tr>
<tr>
<td>8. How many times have you changed homes since kindergarten?</td>
<td>Never</td>
<td>1-2 times</td>
<td>3-4 times</td>
<td>5-6 times</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>The next few questions ask about your family.</th>
<th>NO!</th>
<th>no</th>
<th>yes</th>
<th>YES!</th>
</tr>
</thead>
<tbody>
<tr>
<td>9. My parents ask me if I’ve gotten my homework done.</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>10. People in my family often insult or yell at each other.</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>11. If you drank some beer or wine or liquor (for example, vodka, whiskey, or gin) without your parents’ permission, would you be caught by your parents</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>12. My parents give me lots of chances to do fun things with them.</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>13. How wrong do your parents feel it would be for you to smoke marijuana?</td>
<td>Very Wrong</td>
<td>Wrong</td>
<td>A Little Bit Wrong</td>
<td>Not Wrong At All</td>
</tr>
<tr>
<td>14. About how many adults have you known personally who in the past year have used marijuana, crack, cocaine, or other drugs?</td>
<td>None</td>
<td>1</td>
<td>2</td>
<td>3-4</td>
</tr>
<tr>
<td>Have any of your brothers or sisters ever:</td>
<td>NO</td>
<td>YES</td>
<td>I don’t have any brothers or sisters</td>
<td></td>
</tr>
<tr>
<td>--------------------------------------------------</td>
<td>----</td>
<td>-----</td>
<td>-------------------------------------</td>
<td></td>
</tr>
<tr>
<td>15. Smoked marijuana?</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>16. Taken a handgun to school?</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

**These questions ask about your feelings and experiences in other parts of your life.**

<table>
<thead>
<tr>
<th>How old were you when you first:</th>
<th>Never</th>
<th>10 or less</th>
<th>11</th>
<th>12</th>
<th>13</th>
<th>14</th>
<th>15</th>
<th>16</th>
<th>17 or more</th>
</tr>
</thead>
<tbody>
<tr>
<td>17. Smoked marijuana?</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>18. Attacked someone with the idea of seriously hurting them?</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>How wrong do you think it is for someone your age to:</th>
<th>Very Wrong</th>
<th>Wrong</th>
<th>A Little Bit Wrong</th>
<th>Not Wrong At All</th>
</tr>
</thead>
<tbody>
<tr>
<td>19. Drink beer, wine or hard liquor (for example, vodka, whiskey, or gin) regularly?</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>20. Smoke marijuana?</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>21. Use LSD, cocaine, amphetamines or another illegal drug?</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>22. How much do you think people risk harming themselves (physically or in other ways) if they smoke marijuana regularly?</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>How often do you attend religious services or activities?</th>
<th>Never</th>
<th>Rarely</th>
<th>1-2 Times A Month</th>
<th>About Once a Week or More</th>
</tr>
</thead>
<tbody>
<tr>
<td>23. How often do you attend religious services or activities?</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>24. Think about your four best friends (the friends you feel closest to). In the past year (12 months), how many of your best friends have sold illegal drugs?</th>
<th>None</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>25. I do the opposite of what people tell me just to get them mad.</td>
<td>NO</td>
<td>no</td>
<td>yes</td>
<td>YES!</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>26. What are the chances you would be seen as cool if you smoked marijuana?</th>
<th>No or Very Little Chance</th>
<th>Little Chance</th>
<th>Some Chance</th>
<th>Pretty Good Chance</th>
<th>Very Good Chance</th>
</tr>
</thead>
<tbody>
<tr>
<td>27. You’re looking at CD’s in a music store with a friend. You look up and see her slip a CD under her coat. She smiles and says “Which one do you want? Go ahead, take it while nobody’s around.” There is nobody in sight, no employees and no other customers. What would you do now?</td>
<td>Ignore her</td>
<td>Grab a CD and leave the store</td>
<td>Tell her to put the CD back</td>
<td>Act like it’s a joke, and ask her to put the CD back.</td>
<td></td>
</tr>
</tbody>
</table>
28. How many times have you done crazy things even if they are a little dangerous?

<table>
<thead>
<tr>
<th>Never</th>
<th>I’ve done, but not in the past year</th>
<th>Less than once a month</th>
<th>About once a month</th>
<th>2 or 3 times a month</th>
<th>Once a week or more</th>
</tr>
</thead>
<tbody>
<tr>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>

This section asks about your experiences at school.

29. My teacher praises me when I work hard in school.

<table>
<thead>
<tr>
<th>NO!</th>
<th>no</th>
<th>yes</th>
<th>YES!</th>
</tr>
</thead>
<tbody>
<tr>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>

30. There are lots of chances for students in my school to get involved in sports, clubs, and other school activities outside of class.

Now, thinking back over the past year in school, how often did you…

<table>
<thead>
<tr>
<th>Never</th>
<th>Seldom</th>
<th>Often</th>
<th>Almost</th>
</tr>
</thead>
<tbody>
<tr>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>

31. Enjoy being in school?

32. Try to do your best work in school

33. During the LAST FOUR WEEKS how many whole days have you missed because you skipped or “cut”?

<table>
<thead>
<tr>
<th>None</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4-5</th>
<th>6-10</th>
<th>11 or more</th>
</tr>
</thead>
<tbody>
<tr>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>
REFERENCES


Bender, K. Why do some maltreated youth become juvenile offenders?: A call for further investigation and adaptation of youth services. *Children and Youth Services Review, 32*(3), 466-473.


reports of drug and alcohol use in a sample of drug-abusing and conduct-


