

AN EXAMINATION OF YOUNG OFFENDERS SUBSTANCE USE IN A SAMPLE OF
YOUTH FORENSIC PSYCHIATRIC SERVICES BY MEANS OF TWO SUBSTANCE USE
PSYCHOMETRIC MEASURES

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by
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ABSTRACT

The incidence and patterns of substance use problems among the young offenders admitted to the Youth Forensic Psychiatric Services (YFPS) in British Columbia, Vancouver Island was examined. The convergent validity of the psychometric measures, Adolescent Substance Abuse Subtle Screening Inventory (SASSI-A2, Miller, 1994) and Problem Oriented Screening Instrument for Teenagers (POSIT, National Institute on Drug Abuse, 1991), and the criterion-related validity of these two measures with respect to scores of the substance abuse disorder subscale of the Adolescent Psychopathology Scale - Short Form (APS-SF, Reynolds, 1998) were also examined. The data were collected from 68 volunteered youth between the age of 13 and 18 years old. The study involved three methods of data collection: interview, questionnaire, and file review.

Approximately 90% of the youth had consumed alcohol and drugs at least once in their lives, and the mean age of alcohol and drug first consumption was 12 years. The majority of youth acknowledged that they continued using alcohol and drugs since their involvement with YFPS. Youth who received some type of treatment did not show a greater reduction in alcohol and drug usage at post-admission than youth who did not receive treatment.

Although age was positively correlated with alcohol and drug consumption, gender, IQ and academic achievement were not related to any of the substance use subscales. The convergent validity of the POSIT Substance Use/Abuse scale (POSIT A), the SASSI-A2 Face Valid Alcohol (FVA) and the SASSI-A2 Face Valid Drugs (FVOD) was demonstrated with a highly significant relationship between the two measures (POSIT and SASSI-A2). The criterion-related validity of the POSIT A and the SASSI-A2 (FVA and FVOD) was demonstrated with each having highly significant relationships with the APS-SF Substance Abuse Disorder subscale (APS-SF SUB). The SASSI-A2 FVA and the POSIT A were significantly related to self-reported pre-admission alcohol usage. The SASSI-A2 FVOD also significantly related to self-reported pre-admission drug usage.

These findings indicated that substance use among young offenders was substantial and not effectively treated. The POSIT and the SASSI-A2 were effective tools for identifying substance abuse and dependence problems among young offender clients of YFPS.

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1.0 INTRODUCTION

Substance use is common among youth in North America. Yet, the negative consequences of substance use are often overlooked. Understanding adolescents' substance use is important to identify root problems and to treat youth who abuse substances. Statistics and incidents on adolescents' substance use will be outlined, followed by a presentation on substance abuse as a criminogenic factor as well as substance abuse treatment for young offenders, concluding with an overview of current literatures examining issues around substance use assessment and diagnosis, substance use classification, and relationships between substance use and cognitive ability and academic achievement.

1.1 Statistics and Incidents on Substance Use Among General Youth Population in North America

Alcohol and drug use is relatively common among youth in North America. In the U.S., it was reported that 25% of 12th graders, 16% of 10th graders, and 8% of 8th graders reported binge drinking in 2008, and 33% of 12th graders, 24% of 10th grader, and 11% of 8th graders reported use of marijuana, the second most frequently used drug among youth in the U.S. in 2008 (Johnston, O'Malley, Bachman, & Schulenberg, 2010). In Canada, there have been several national surveys conducted to obtain estimates of alcohol and drug-related behaviours and outcomes (i.e., the National Alcohol and Other Drugs Survey (NADS), 1989; Canada's Alcohol and Other Drugs Survey (CADS, 1994; the Canadian Addiction Survey (CAS), 2004; the Canadian Alcohol and Drug Use Monitoring Survey (CADUMS), 2008 and 2009). The CAS (2004) was a telephone survey, and 2085 out of 13,909 Canadians surveyed were youth between the ages of 15 and 24 years old, and 1020 of those youth were between the ages of 15 and 19 years old.

According to the CAS (2007), 90.8% of youth have used alcohol in their life time, and 82.9% have used alcohol in the past 12 months. In 2009, 75.5% of youth aged 15 to 24 years of age reported past-year drinking (CADMUS, 2009). The mean age at which the youth first consumed alcohol was 15.6 years. In 2004, 75.1% of youth (766 out of 1020 surveyed) aged 15 to 19 reported past-year drinking (CAS, 2007). About sixty five percent (377 out of 581 surveyed) of the youth between the age of 15 and 17 years old and about 89% (389 out of 439 surveyed) of the youth between the age of 18 and 19 years old reported drinking in the past-year (CAS, 2007). Among youths between 14 and 24 years old, about 20% of them self-reported

being heavy frequent drinkers (defined as drink once a week or more, usually 5 or more drinks when alcohol is used, CAS, 2007, p23), while only about 4% of adults older than 25 years old reported this much drinking (CADMUS, 2009). CAS (2007) revealed that out of 766 youth between the age of 15 and 19, about 119 youths (15.5% surveyed) self-reported drinking heavily frequently over the past year. Kosterman, Hawkins, Guo, Catalano, and Abbott (2000) examined alcohol and marijuana use onset among adolescents and found that approximately 65% of the adolescents interviewed in their study had used alcohol by the age of 13 years, 71% of them had used alcohol by the age of 14 years, and 88% of them had used alcohol by 18 years of age.

These findings indicate that substance use among youth is quite prevalent, and it is certainly a serious concern since Kosterman et al. (2000) found that approximately 40% of youth who started drinking at age 14 or younger (71% of their sample had initiated drinking alcohol by 14) suffered alcohol dependence at some point in their lives, and while only 10% of those who started drinking at 21 or older developed problems. In other words, the younger a person was when introduced to alcohol, the higher the chance of developing substance-related problems in their lives. Moreover, Gordon, Kinlock, and Battjes (2004) found that earlier substance use onset was significantly related to greater criminal severity and higher arrest rates.

Drug use is also relatively prevalent among youth. CADUMS (2009) revealed that the rate of drug use by youth between the age of 15 to 24 was dramatically higher than that of adults who were 25 years old or older: for cannabis use, 26.3% among youth and 7.6% among adults, and for other drugs, 6.3% for youth and 1.3% for adults. However, Kosterman et al. (2000) found that marijuana is less prevalent among adolescents. Only 13% of the adolescents had initiated marijuana use by the age of 13 years, and only 50% of them had initiated marijuana use by the age of 18 years.

The rate of hazardous drinking peaked among youth aged 18 to 19 years (44.6%), and youth who started drinking earlier were more likely to drink hazardously (CAS, 2007). Also, youth drink less frequently than adults, but when they drink, youth tended to drink more (CAS, 2007). Binge drinking appeared to be a significant concern among youth. The preceding findings indicated that substance use treatment for youth is in demand, and effective means of intervention and prevention are needed to reduce substance use problems in the general population of youth.

1.2 Statics and Incidents on Substance Abuse Among Young Offenders

It is important to pay special attention to the youth who enter the justice system since a number of studies have found that the incidence of substance use among young offenders is greater than for non-offender populations. For example, the incidence of psychoactive substance use (other than alcohol) was two to five times higher among young offenders than for a national sample of non-offender high school students in Australia (Putnins, 2003).

According to Tripodi and Bender (2011), the number of young offenders with alcohol or drug problems who came in contact with the criminal justice system has varied over the past 20 years. For example, *Monitoring the Future*, a longitudinal study of American adolescents on alcohol and drugs, reported that alcohol and drug use among youth peaked in 1998. It then showed a steady decline until 2008, when the rate started to increase again (Johnston et al., 2010). The most common psychiatric problems among youths in the justice system, who meet the DSM-IV criteria for psychiatric problems, were alcohol and drug disorders (Teplin, Abram, McClelland, Dulcan, & Mericle, 2002). In the Canadian context, for example, it is estimated that 80% or more of youths who come in contact with Youth Forensic Psychiatric Services (YFPS) on Vancouver Island, British Columbia, have experienced some level of substance abuse (Clark, personal communication, October, 2010).

Mark et al. (2006) claimed that substance abuse disorder in adolescents could continue into adulthood and could have a substantial effect on youth growth and development. Past research also revealed that when substance using youth were left untreated, the severity of their substance use and their criminal activities increased (Lipsey & Derzon, 1998).

Numerous studies have examined the relationship between substance use treatment and recidivism. Several studies demonstrated that the longer offenders stay in treatment programs, the less likely they are to recidivate upon discharge from the system (Simpson, Joe, & Brown, 1997; Sirotnik & Roffe, 1977; Wexler, Falkin, Lipton, & Rosenblum, 1992). For example, Hiller et al. (1999) found that long term residential treatment programs have been found to reduce post-incarceration involvement in illicit drugs and crime. Unfortunately, Hiller et al. (1999) stated that studies have not sufficiently analyzed discrete elements of the treatment process. Therefore, there is not enough information to determine what improved outcome. In addition, Field (1992) found that offenders who completed the treatment program in custody had significantly lower reconviction and rearrest rates than those who did not complete the treatment

program, and offenders who had the least exposure to treatment exhibited the highest rearrest and reconviction rates.

Further, Cottle et al. (2001) argued that intervention delivered in residential treatment settings should be structured around risk factors in order to maximize risk reduction. Research has shown that providing an appropriate substance abuse treatment to an appropriate target population will reduce recidivism, whereas failing to address substance abuse problems appropriately may lead offenders to subsequent failure and continued involvement in criminal behaviour (Marlowe et al., 2011; Smith, Gendreau, & Swartz, 2009). Providing insufficient substance abuse treatment for offenders who have been addicted to drugs and alcohol has been shown to increase the recidivism rates (De Leon et al., 2008; Karno & Longabaugh, 2007; Vieira et al., 2009). Corresponding with the principles of effective intervention (Andrew & Bonta, 2003; Gendreau, Smith, & French, 2006), a formal or intensive substance abuse treatment, such as residential or group-based treatment, to non-addicted offenders was associated with poorer treatment outcomes and higher recidivism rates than those of non-addicted offenders who did not receive a formal substance abuse treatment (Marlowe et al., 2011). Moreover, it was found that greater treatment gain was seen for young offenders than for adult offenders (Day, Howells, & Rickwood, 2004). Therefore, it is very important that substance abuse be appropriately addressed at an early age in order to reduce recidivism, prevent future re-offending, and keep crime-free in the community.

1.3 Substance Abuse as a Criminogenic Factor: One of the Central Eight

Dowden and Latimer (2006) stated that past research has shown both static and dynamic risk factors are related to criminal behaviours. Andrews and Bonta (2010) identified the *Central Eight* risk/need factors. They include antisocial attitudes, antisocial associates, antisocial personality, a history of antisocial behaviours, leisure and recreation, family and marital, substance abuse, and employment and education, which are linked to the origin of criminal behaviour; therefore, they are called criminogenic needs (Olver, Stockdale, & Wormith, 2009). Since static risk factors do not change, targeting treatment on static risk factors is not effective. Therefore, the primary focus of correctional research has been to identify dynamic risk factors (changeable personal characteristics) that are related to criminal behaviours and the intervention and treatment that are capable of addressing them (Dowden & Latimer, 2006).

Andrews and Bonta (2003) stated that predictions of risk measured by static risk scales provide information on offenders' placement upon release from institutions. However, the static risk information provides little information about treating offenders effectively (Andrews & Bonta, 2003). On the other hand, dynamic factors have the potential to change through well planned intervention, and successful intervention will reduce risk of recidivism (Cottle, Lee, & Heilbrun, 2001). To provide effective correctional treatment, differential treatment that meets offenders' unique individual needs is also required (the responsivity principle; Andrews & Bonta, 2010).

Past research has demonstrated that treatments and services that target the central eight areas of risk and need reduce criminal recidivism (Andrews et al., 1990). Cottle et al. (2001) found that factors in the family and social domain such as family instability, problematic interactions with family members, association with delinquent peers, and poor use of leisure time were dynamic risk factors. Also, they identified conduct problems, non-severe pathologies, and substance abuse as possible dynamic risk factors; however, these factors had not been well tested empirically when they conducted their meta-analysis (Cottle et al., 2001).

More recent studies have identified substance abuse as one of the most prominent dynamic risk factors. For example, Dowden and Latimer (2006) found that substance abuse is one of the most prominent dynamic risk factor among young offenders. In addition, the National Center on Addiction and Substance Abuse (NCASA, 2010) found that more than 80% of offenders in the U.S. have some form of involvement with illicit drugs or alcohol, and half of them met the DSM criteria for substance dependence or addiction. Further, numerous studies have shown that substance abuse is significantly associated with an increase in the likelihood of recidivism (Marlowe et al., 2011).

Substance abuse is one of the important criminogenic needs not only for adult offender populations but also for young offenders. Past studies found that severe substance use is associated with increased severity of criminal behaviour (Sealock, Gottfredson, & Gallagher, 1997). Numerous studies have found a strong association between substance abuse and offending among youth (Dembo, William, Getru, Genung, Schmeidler, & Berry, 1991; Gordon, Kinlock, & Battjes, 2004; Hammersley, Marsland, & Reid, 2003; Putnins, 2003). For example, Trimboli and Coumarelos (1998) found that the greater the level of cannabis use, the greater the frequency of criminal conduct. Further, it was found that incarcerated youth were approximately

three times more likely to have substance abuse problems in the past year than non-incarcerated youth (Molider, Nisseen, & Watkins, 2002), and about 50% of incarcerated youths reported that they used alcohol or drugs when they committed their offence (DeMatteo & Marczyk, 2005).

Offender risk assessments are primarily conducted to estimate the risk of reoffending (Putnins, 2003). In order to accurately predict the risk of reoffending, it is important to look for relationships between various factors and offending. The term, predictor variables, is often used to refer to variables that have significant association with outcome variables/ dependent variables (recidivism, for example). However, those variables do not always accurately predict recidivism (Cottle, Lee, & Heilbrun, 2001).

Several studies have shown an important relationship between substance use and offending. However a simple association between substance use and offending is insufficient because a substantial proportion of young offenders generally have a history of substance use, and their use of substance is not restricted to the time of offending only (Cottle et al., 2001). Many forensic professionals are more interested in the degree of substance use and its relationship with reoffending. Unfortunately, studies examining the predictive relationship between substance use and recidivism have not focused on this question (Putnins, 2003).

Several studies have examined the relationship between substance use and recidivism and revealed only a modest relationship between the two factors. For example, in their meta-analysis, Cottle et al. (2001) found a weighted mean effect size (Z_r) of .015, $p < .001$ ($n = 1111$, $k = 6$) for substance abuse and recidivism. The result was a significant, but weak, relationship with recidivism. Similarly, Putnins (2003) found a statistically significant but weak relationship between frequency of drinking previous to incarceration and reoffending (i.e., for alcohol, $r = .08$, $p < .05$ for any reoffending and $r = .13$, $p < .01$ for violent offending; for inhalant, $r = .10$, $p < .05$ for any offending, $r = .16$, $p < .01$ for violent reoffending, and $r = .08$, $p < .05$ for other offending, $n = 445 - 447$). Although significant, these relationships are too weak to have practical significance (Putnins, 2003). Cottle et al. (2001) argued that since a large number of young offenders use substances which means variability is restricted, the discriminative power of substance use is diminished; hence, their results did not present a strong relationship (Cottle et al., 2001).

Moreover, Putnins (2003) also found that there was no significant relationship between substance use during the last committed offence and recidivism except one significant finding, a

weak relationship between the use of inhalants and violent recidivism, $r = .17, p < .01$ ($n = 444$). Contrary to popular belief, Putnins (2003) found no relationship between a psychoactive substance use at the time of the most recent offence and subsequent criminal offending nor having a problem with substance use. When the frequency of alcohol and inhalant use were combined, Putnins (2003) found a significant relationship with recidivism ($r = .12, p = .007, n = 446$). Putnins (2003) concluded that no obvious pattern of substance use distinguished general offending, violent offending, and non-violent offending. In addition, he concluded that the use of substances at the time of recent offending did not predict recidivism (Putnins, 2003). Although marijuana use at the time of last offence has been reported among higher proportion of young offenders, Putnins (2003) argued that the relationship between marijuana use and offending is more coincidental than causal because he believed that a large number of young offenders at any time are under the influence of marijuana. Further, he concluded that alcohol and inhalant use are the most consistent and strongest predictive factors among all substances (Putnins, 2003). Therefore, adding items related to the use of recent alcohol and inhalant use to a recidivism risk assessment instrument should be valuable for risk assessment (Putnins, 2003).

Watts and Wright (1990) provided some explanation as to what accounts for the relationship between substance abuse and criminal behaviours among young offenders. They indicated that in order for young offenders to be accepted among their criminal peers, they have to prove their toughness, and the use of drugs is a way to show their "tough guy" image to their criminal peers. Also, it was believed that young offenders use substances to obtain parental attention, and substances provide them a way to escape from stressors within their lives. If this is true, there should be a significant association between having antisocial peers and substance use and between family/parent relationship and substance use.

1.4 Substance Abuse Treatment for Young Offenders

Not only is substance use prevalent among young offenders, a number of studies have found that substance use and youth crime are closely related activities (Putnins, 2003). Putnins also suggests that a number of youths are under the influence of substances while they offend. For example, Putnins (2003) found that 60% of 900 young offenders in Australia were under the influence of substances at the time of committing their most recent offence. Lennings, Kenny, and Nelson (2006) found that 90% of their sample of young offenders reported some use of illicit drugs, 87% of them had used marijuana, and 47% of them had used amphetamines in the past 12

months. These statistics clearly indicate that substance abuse treatment for adolescents in general is needed. However, Brannigan and others found surprisingly few substance abuse treatment programs specifically designed for adolescents, and very few scientific studies have been conducted to examine the effectiveness of treatment in the United States (Brannigan, Shackman, Falco, & Millman, 2004). Similarly, more scientific studies on the effectiveness of substance abuse treatment programs for adolescent offenders may be needed in Canada.

When risk is assessed, risk of general and violent recidivism is typically considered and there is not a focus on substance abuse unless substance abuse problems are combined with other offences (e.g., general offence, violent offence, sexual offence). According to Olver et al. (2009), risk assessments are conducted primarily to protect the public. If that is the case, the fact that substance abuse is often overlooked may be understandable since the individual offender's substance use problem may not harm the public as much as other types of offences. Therefore, the substance abuse issue is often overlooked unless offenders were involved with other offences. For example, substance abusing youth may be assessed on their risk of reoffending at YFPS only if youth have committed a violent crime, in which case, they are administered the Structured Assessment of Violence Risk in Youth (SAVRY; Borum, Bartel & Forth, 2002; Clark, personal Communication, August, 2011). The SAVRY is designed for use in intervention planning and monitoring progress. It helps professionals to formulate a professional judgement about a youth's level of risk (PAR, 2012).

After offenders' risk of reoffending is assessed, treatment need and responsivity would logically be taken into consideration to provide effective treatment. In general, high risk offenders have multiple needs (Andrews & Bonta, 2003). There are two primary types of needs: criminogenic and non-criminogenic needs (Andrews & Bonta, 2003). As described above, criminogenic needs are dynamic risk factors that are related to offenders' risk level, and when they change, they are related to change in the probability of recidivism (Andrews & Bonta, 2003). Therefore, if treatment is offered to reduce recidivism, changes must occur on criminogenic risk factors.

Finally, responsivity refers to delivering treatment programs in a way that is consistent with offenders' learning styles and ability to take advantage of treatment (Andrews & Bonta, 2003). Responsivity is an important concern among Aboriginal youth offenders and female offenders. What works for male offenders may not work for female offenders (male needs may

be different from female needs) and what works for non-Aboriginal young offenders may not work for Aboriginal young offenders (cultural differences). Hence, responsivity to treatment may be different among different groups.

In the past, forensic studies have been primarily conducted with male offender samples since there are more male offenders in the criminal justice system than female offenders, and it has been easier to access and collect enough data on male samples. However, early theories of female delinquency are different from those of their male counterparts. Therefore, it has been suggested that females are fundamentally different from males (Simourd & Andrews, 1994). Moreover, female delinquency has been perceived as relatively rare and less serious than male delinquency (Simourd & Andrews, 1994). Therefore, it is reasonable to assume that the risk of reoffending, treatment needs and treatment responsivity are different across gender. In sum, identifying personality, cognitive styles, learning abilities and styles of each offender and matching each client to appropriate treatment may increase the rate of responsivity to treatment (Andrews & Bonta, 2003).

Simourd and Andrews (1994) conducted a meta-analysis to examine the relationship between risk factors and recidivism to find if risk factors are different for male and female offenders. They found that antisocial peers or antisocial attitudes, temperament or misconduct problems (e.g., psychopathy, impulsivity, and substance use) were strongly associated with delinquency, and there was no difference in risk factors across gender (Simourd & Andrews, 1994). This finding suggests that when conducting a general risk assessment with measurements that are developed based on these risk factors, risk of reoffending will be identified equally well across gender.

More recent studies on substance abuse have resulted in somewhat different findings. Putnins (2003) found a strong relationship between the use of sedatives and hypnotics and recidivism as well as a strong relationship between the use of hallucinogens and recidivism among female offenders ($r = .47, p < .01$, and $r = .40, p < .01$, $n = 36$ to 38 , respectively). In addition, he found a moderate relationship between the frequency of substance use and recidivism among female offenders ($r = .35$ to $.38, p < .01$, $n = 36$ to 38). Contrary to popular belief, there was no significant relationship between substance use and recidivism among male offenders. This implies that gender difference should be taken into account when risk of

recidivism is measured. If criminogenic needs are different between male and female offenders, treatment needs and responsivity will likely be different between the two groups as well.

Olver et al. (2009) indicated that few studies in their investigation of three predictive risk instruments (i.e., Youth Level of Service/Case Management Inventory (YLS/CMI; Hoge & Andrews, 2006), the SAVRY, and the Hare Psychopathy Checklist: Youth Version (PCL: YV; Forth, Kosson, & Hare, 2003)) specifically examined female young offenders and ethnic minorities. They also suggested that their predictive accuracy may be different among diverse offender groups (i.e., gender, culture, and ethnic groups). Substance abuse is often overlooked, while violent offences and sexual offences have been a primary concern from a risk and treatment perspective of many forensic professionals in the field.

Dowden (2003) noted the lack of attention given to cultural issues within substance abuse treatment programs. He also argued that in order to increase the clinical utility of treatment programs for Aboriginal populations, the programs must be culturally sensitive and relevant. Wilson (2003) stated that when a treatment program for the Aboriginal population is designed, Aboriginal beliefs, culturally specific practices, such as healing, reconciliation, spirituality, respect, accountability, balance, and restoration, should be integrated into the program in order for the program to work effectively. According to Wilson (2000), Correctional Services Canada examined substance abuse treatment completion and recidivism on federally sentenced adult Aboriginal offenders who were admitted to Healing Lodges. Result indicated that 70% of the participants completed treatment and only six percent of the program participants returned to custody at a one-year follow up, while the national average was a 12% recidivism rate.

Treatment programs that are specifically targeted to Aboriginal youth are also required. However, there have not been many culturally adjusted substance use treatment programs available for Aboriginal youth in Canada. For example, when substance abuse treatment is provided to Aboriginal young offenders who come to YFPS, most often it is not necessarily designed for Aboriginal youth because culturally specific treatment programs are usually not available. Moreover, studies on substance abuse among Aboriginal offender populations have been focused on Aboriginal adult populations (Dowden, 2003).

Past research on substance abuse treatment programs has revealed that the kind of treatment available for youth in the justice system has not provided the comprehensive, multifaceted services that youth require (Brannigan et al., 2004; Mark et al., 2006). Many

substance abuse treatment programs offered to adolescents were initially designed for adults. Consequently, they failed to address the needs of adolescents because adolescents often have higher rates of multiple diagnoses, different developmental needs, and higher rates of opportunistic use of substances (Brannigan et al. 2004; Mark et al. 2006).

In addition, a major problem for treatment of offenders with substance abuse issues is that they have a high dropout rate (Dowden & Latimer, 2006). Therefore, research that identifies factors that are predictive of treatment dropout is important to reduce the attrition rate and to maximize the effectiveness of those interventions (Dowden & Latimer, 2006).

Hiller, Knight, and Simpson (1999) conducted a study to examine risk factors that predict dropout from substance abuse treatment among adult offenders. They constructed a criminality classification index and found that scoring high on their criminality classification index, cocaine dependence, history of psychiatric treatment, unemployment before treatment (at the time of arrest), having a higher level of depression, anxiety, hostility, deviant peer association, and lower self-efficacy were related to early treatment dropout. Among these factors, the risk index was the strongest predictor of early treatment dropout (Hiller et al., 1999). With such information, field practitioners should be able to develop treatment programs that have higher participant retention (treatment completion) rates. The most important objective is for offenders not to recidivate after their return to the community. Hiller et al. (1999) suggested that the impact of treatment programs that are based on their findings may be examined by comparing offenders who went through their treatment programs to those who do not receive such treatment. It is also important to know what factors are associated with treatment dropout in order to increase the retention rate and use limited resources efficiently. However, there are no studies that have examined predictors of substance abuse treatment dropout among young offenders, and the effectiveness of the treatment program that are developed based on such findings.

Brannigan et al. (2004) examined the quality of 144 highly regarded substance abuse treatment programs for youth in the U.S. They found that most of the programs did not adequately address many of the important issues (i.e. assessment and matching, comprehensive integrated approach, family involvement, development appropriateness, engaging and retaining, qualified staff, gender and cultural competence, continuing care, and treatment outcomes) of effective adolescent substance abuse treatment. Henderson et al. (2007) and Mark et al. (2006) also found that many programs lacked comprehensive assessment (substance abuse, mental

health, and medical) and were not designed to meet the developmental needs of adolescents, although this feature is essential for successful treatment.

Lennings et al. (2006) examined treatment seeking behaviour among a sample of young offenders who were serving community orders in Australia. They found a gap between problematic drug and alcohol use and treatment seeking behaviours. In addition, they found that about 40% of the sample had significant substance abuse problems, while only 18% of the sample had been offered a referral for treatment. Lennings et al. (2006) found very low rates of treatment utilization for young offenders with substance abuse problems, despite very high rates of substance abuse among this population. Lennings et al. (2006) concluded that relatively few young offenders in Australia have access to formal substance abuse treatment despite the increased need for such treatment. Similarly, Johnson et al. (2004) found that over 65% of their sample had a need for treatment, but only 48% of them had actually received any.

Treatment service may be more related to court orders than criminogenic needs. Bonta, Rugge, Sedo, and Coles (2004) found that intervention plans for young offenders were more likely to be developed based on a court order rather than what the offender assessment indicated. Further, the authors found that substance abuse was a problem for youth and the intervention was recommended in 80% of the cases. However, criminogenic needs identified in offenders' assessments were not addressed in the case plans for the majority of cases. Consequently, youth in need of treatment tended not to be referred to treatment or did not receive treatment (Bonta, et al., 2004).

Henderson et al. (2007) stated that there was a general trend of lack of resources across multiple systems of care. Although often the juvenile justice system has been the primary point of access for many youths in need of treatment, services provided to the youth have often been fragmented. What is more problematic is that treatment providers are often unable to collaborate effectively to enable the youth to stay in the program. Henderson et al. (2007) further indicated that once youths are released to the community from institutions, they often return to the cycle of substance abuse and are at high risk of recidivism. Therefore, treatment programs that provide aftercare and services that continue after their return to the community are important. Donovan (1988) suggested that treatment by the facilities that provide discharge planning and aftercare seems to be more promising. In addition, post-treatment monitoring of the youth and recovery support services would strengthen the stability and chances of recovery (Donovan, 1988).

Although there is a growing number of studies on substance abuse among young offenders in North America, research on substance abuse treatment effectiveness for youth is still a relatively new field. It has not been thoroughly explored like the sex offence and violent offence treatment programs, which have been studied and evaluated thoroughly in numerous institutions (Brannigan et al., 2004). Brannigan et al. further indicated that less than 10% of the substance abuse programs for adolescents have been evaluated scientifically for treatment effectiveness on outcomes. For example, Tripodi and Bender (2011) conducted a systematic literature review to examine the effectiveness of substance abuse treatment on alcohol and marijuana use for young offenders. They found that treatment programs appeared to have a small to moderate effect on alcohol and marijuana reduction among young offenders. Among various interventions strategies, more effective or promising methods included Multisystemic Therapy (Brannigan et al., 2004; Shaeffer & Borduin, 2005; Tripodi & Bender, 2011;), multidimensional treatment foster care, teaching family, life skills training (Tripodi & Bender, 2011), therapeutic community (Brannigan et al., 2004), and family-based treatment program (Brannigan et al., 2004; Mark et al, 2006). Either individual-based interventions or family-based interventions did not reduce alcohol and marijuana use. Compared to their previous study that examined the effectiveness of substance abuse treatment programs among youth in general populations, they found that the effect sizes of treatment programs among the offender samples were small. Tripodi and Bender (2011) stated that their meta-analysis demonstrated several promising interventions for high-risk youth, but future study was needed to better understand what works best in reducing substance abuse among young offenders. Further, Brannigan et al. (2004) found that the programs in their study performed poorly on areas such as assessment and treatment matching, engaging and retaining teens in treatment, gender and cultural competence and treatment outcomes. Therefore, Brannigan et al. (2004) expressed a great need for outcome evaluation of substance abuse treatment programs for young offenders.

More than 80% of the substance abuse treatment programs reviewed by Brannigan et al. (2004) performed poorly on assessment and treatment matching. This is problematic since an appropriate assessment for treatment is essential for providing effective treatment which is tailored to the unique needs of youth. Recent research has shown that organizational characteristics such as organizational climate, training opportunities, resource adequacy, network

connectedness, and administrator and staff attitudes (Henderson et al., 2007) affect adoption, implementation, and sustainability of effective treatment (Henggeler, 2004.)

YFPS is no exception to the trends mentioned above. For violent and sex offences, YFPS provides treatment to their clients directly. In the past, some clinics (at the individual clinic level) of the YFPS in British Columbia have made use of a psycho-educational group-based program called “the Youth Substance Abuse Management (Y-SAM) program” to address substance abuse issues (Clark, Personal communication, August 9th 2011). The Y-SAM program was intended for youth who are low to medium risk (Province of British Columbia, 2011). However, YFPS, in conjunction with Probation Officers also refers youth clients who have substance abuse treatment needs to external treatment services and facilities. For this reason, the issue of substance abuse has not been a focus of research within YFPS to the same degree that other risk factors often associated with violent and sexual offences have been.

1.5 Issues Around Substance Use Assessment/Diagnosis

Adolescents often abuse alcohol and other substances, and, consequently, their development is interrupted by these behaviours and negatively affected as they mature into adulthood (Simons, Finlay, & Yang, 1991). According to Winters (2003), there are four major issues that pertain to evaluating youth for alcohol and other substances and related problems: 1) developmental issues, 2) validity of self-report, 3) instrument available for assessment, and 4) research needs in the field. The researchers at the Center for Substance Abuse Treatment found a different substance use pattern between youth and adults (Winters, 2003). Youth were more likely to abuse substances such as marijuana and other drugs concurrently with alcohol. On the contrary, adults who received treatment for substance problems tended to be in treatment specifically for alcohol dependence (Winters, 2003). Winters (2003) stated that while adults would usually take longer to acquire a diagnosable substance use disorder, adolescents could meet formal diagnostic criteria for substance abuse or dependence within a year or two from the initiation of their substance use. Therefore, Winters has contended that using time as a factor in defining substance use disorder among youth might be inappropriate and misleading.

In addition, Winters (2003) has had concerns about the appropriateness of DSM-IV criteria for substance use disorder for youth. Henly and Winters (1988) found that the major reasons youth with a substance dependence used substances were social conformity and mood enhancement. In other words, youth with substance dependence used substances to conform to

the social norms of a group of which the youth was a member and to be accepted by group members. They also used substances to enhance their mood (i.e., temporal relief from stress, anxiety, and fear).

Dowden (2003) stated that past research has demonstrated that there was substantial individual variability in terms of how young offenders would respond to the same risk factors. Research has shown that protective factors have played a role to prevent some youth from reoffending, while others with the same risk factors without protective factors recidivated. However, few studies have explored the role of protective factors in providing effective treatment to young offenders and the impact of protective factors on the prediction of outcome and the treatment of criminal behaviours (Dowden, 2003). Dowden (2003) believed that if a treatment program could be built around those protective factors, it would enhance pre-existing positive conditions in youth. For this reason, exploring and understanding protective factors is an important first step to understand how they relate to substance use disorder and how they may affect a youth's clinical diagnosis with substance use disorder. Such knowledge will help to develop effective substance abuse treatment plans for youth in need of treatment.

According to Winters (2003), some research has demonstrated the validity and reliability of self-report for substance use. However, this research has produced inconsistent results. In addition, Winters (2003) found that parental reports often did not provide accurate information. In the past, researchers compared clinical diagnoses of substance use based on parental reports with those based on self-reports. The diagnostic agreement ranged from 17% to 63% (Edelbrock et al., 1986; Weissman et al., 1987). This finding indicates that parental reports and self-reports might not be reliable methods to identify substance use problems.

Good instruments should be capable of identifying youth who are at high risk of developing a substance use disorder or who have already developed it and who are in high need of treatment. Therefore, the validation of instruments is a very important task for treatment agencies so that youth risk and need can be accurately assessed, and youth subsequently referred to a substance use treatment program that meets the individual's unique needs. In addition, an accurate assessment may assist in developing treatment plans to reduce both recidivism and substance use problems. Screening tools, such as SASSI-A2, are tools that youth can complete relatively quickly (i.e., 20 minutes) compared to other similar substance use measures. Multiscreening tools like POSIT are comprehensive instruments which are designed to assist

clinicians in developing treatment plans that are unique to individual's need. An advantage of POSIT is that its administration time (i.e., 20 minutes) is shorter than many other comprehensive screening tools.

1.6 Substance Abuse Classification

Feldstein and Miller (2007) commented that the sensitivity of an instrument is important for screening purposes. In this context, it is more important to have high sensitivity with few false negatives than high specificity and few false positives. With this goal in mind, Rahdert (1991) used a cut-off score of one for the substance use and abuse subscale on the POSIT. She disclosed that the cut-off scores for the POSIT were chosen in order to be very sensitive to detect problems and to reduce the chance of making type II error (false negatives). Therefore, she cautioned that POSIT scores may produce many false alarms (false positives). If this study adheres to the standard cut-off as the author suggested, high rates of false positives may be found. Latimer, Winters, and Stinchfield (1997) suggested the cut-off score of two should be used for adolescents who are at medium and high risk for drug abuse. Further, Latimer et al. (1997) emphasized the importance of maximizing sensitivity and minimizing false negatives, by using the cut off score of two for adolescents in outpatient treatment clinics, inpatient mental health centers, inpatient substance abuse and psychiatric clinics, and correctional institutions. For example, a classification accuracy of 84% (21% false positive rate, and 5% false negative rate) was obtained by using a cut-off score of two, while a 75% classification accuracy (38% false positive and 0% false negatives) was obtained with a cut-off score of one.

1.7 Substance Use and Cognitive Ability and Achievement

Lynskey and Hall (2000) reviewed studies that examined relationship between cannabis and educational attainment. They found a significant relationship between cannabis use in early age and subsequent low educational achievement. Fergusson, Horwood and Beautrais (2003) conducted a longitudinal study and found similar findings. They found that increasing cannabis use was related to increasing risk of school drop-out, failure to enter university, and failure to obtain a university degree. Those who had used cannabis more than 100 times were about six times higher than those who had never used cannabis to leave school. However, they found that later cannabis use was unrelated to levels of cognitive ability and academic achievement in middle school and early adolescence. Youth who used cannabis 100 times or more by age 16 were three times more likely to leave school than those who did not use cannabis. However,

frequent use at an early age was not associated with risk of educational failure or under achievement prior to entering high school. Fergusson et al. (2003) concluded that cannabis use had greatest impact on young users, and this impact declines with aging. Studies which examined the short term impact of cannabis use prior to school exams have not been conducted. Therefore, how cannabis use affects cognitive ability and subsequent performance is not known.

1.8 Summary of Substance Use Among Youth

As previously stated, over 90% of youth in Canada reported to have consumed alcohol in their life time (CAS, 2007), and 50% of youth have used marijuana by 18 years old (Kosterman et al., 2000). Kosterman et al. (2000) also found that 40% of youth who started drinking at age 14 or younger suffered alcohol dependence later in their life. These base rate findings are concerning in themselves; however, Putnins (2003) stated the incidence of substance use among young offender was two to five times higher than national average. Lipsey and Derzon (1998) stated that the severity of substance use and criminal activities will increase if substance use among youth were left untreated. These findings led the researcher to believe substance use treatment at younger age is necessary as greater treatment gain was seen for young offenders than adult offenders (Day et al., 2004). In order to appropriately provide treatment for young offenders with substance use problems, more research on substance use among young offenders is needed.

1.9 The Current Study

The first purpose of this study was to develop a descriptive picture of clients in an outpatient youth forensic setting who exhibited substance use problems. YFPS is a provincial program of the Ministry of Children and Family Development that provides court-ordered and court-related assessment and treatment services for troubled youth in British Columbia, Canada (British Columbia. Ministry of Children and Family Development, 2015). The researcher was particularly interested in patterns of substance use among the young offenders who were referred to YFPS. For example, the incidence of substance use was examined by looking at frequency and amount of substances consumed by youth. Other specific matters within the present study that were explored included relationships between physical/mental health (i.e., psychopathology) and substance use, and the relationship between protective factors (i.e., social skills, peer, family relationships, education, leisure and recreation) and substance use.

Secondly, the current study was conducted to validate two psychometric measures of substance abuse and substance dependence, namely the Adolescent Substance Abuse Subtle Screening Inventory (SASSI-A2: Miller, 1994) and the Problem Oriented Screening Instrument for Teenagers (POSIT: National Institute on Drug Abuse, 1991) with adolescent offenders. The convergent validity of the psychometric measures, the SASSI-A2 and the POSIT, was examined. The criterion-related validity of these two measures was also examined. It did so by comparing the scores and score-derived classification to the Adolescent Psychopathology Scale - Short Form (APS-SF; Reynolds, 1998) scores, which is often used by psychologists at YFPS to assess various pathologies including substance abuse and dependence. Feldstein and Miller (2007) examined 36 peer reviewed reports, published between 1985 and 2006, on the SASSI's reliability and validity. They did not find any empirical evidence showing the SASSI was more sensitive, accurate, or less susceptible to falsification in screening for substance use disorder than other screening tools, which are available in the public domain and directly measure substance use disorder (Feldstein & Miller, 2007). Moreover, they found no studies which were able to increase the validity of the SASSI-A2 to a significant incremental degree with other instruments. Therefore, based on their review, Feldstein and Miller (2007) recommended that it would be cost effective to use instruments that are free of charge and available in the public domain, and are as good as the direct scale, the SASSI-A2. The POSIT is available in the public domain. If this study could demonstrate that the POSIT is as accurate as the SASSI-A2 in identifying young offenders with substance abuse problems, one could conclude that the POSIT is a cost effective substitute for the SASSI-A2. This would help agencies, such as YFPS which refers its clients to substance use disorder treatment programs, to assess clients accurately and cost-effectively.

The SASSI-A2 is a self-report measure which specifically screens substance abuse and substance dependence, while the POSIT is a multi-screening self-report measure (a less specific measure which includes other domains such as physical and mental health, aggressive behaviours and delinquency, social skills, leisure and activity). Since the SASSI-A2 is specifically designed to assess substance abuse and dependence, one would expect that the SASSI-A2 predicts substance abuse or dependence better than the POSIT. However, if no significant difference was found between the SASSI-A2 and the POSIT scores, one might argue that the POSIT may be advantageous over the SASSI-A2. Moreover, the POSIT includes domains that can identify other problem areas that relate to clinical diagnosis. Another

advantage of the POSIT over the SASSI-A2 is the administration time. Both the SASSI-A2 and the POSIT take approximately 20 minutes to administer. Therefore, the POSIT should allow researchers to acquire more information about a diverse range of issues compared to the SASSI-A2 within the same amount of time.

This research is the first study to thoroughly examine substance use problems among clients of YFPS clinics on Vancouver Island. The study involved three methods of data collection: questionnaire, interview, and file review. First, data were obtained from the administration of psychometric measures (SASSI-A2 and POSIT). Second, an interview, which included the use of questions developed by the researcher, was conducted to gather detail alcohol and drug use, treatment information, as well as background information. Third, data were obtained by reviewing youths' files, and collecting and coding information from the YFPS's database at YFPS.

It was proposed that findings from this study could demonstrate the value of SASSI-A2 and POSIT to YFPS and assist YFPS to appropriately diagnose youth, refer youth who have substance use problem to appropriate treatment facilities, and to deal with its clients with substance use problems more appropriately. It was also proposed that the findings from this study might assist YFPS staff to diagnose substance use disorder more accurately. At the same time, this study might assist the Ministry to utilize its scarce resources more efficiently by offering substance abuse treatment which meets clients' unique needs and by developing a better case management plan for them.

2.0 METHODOLOGY

2.1 Methodological Overview

This study investigated the pattern of substance use among young offenders. Descriptive statistics as well as correlational analyses were conducted to understand young offender substance use. This study was also conducted to validate two psychometric measures of substance abuse and substance dependence, the SASSI-A2 and the POSIT with adolescent offenders. It did so by comparing the scores and score-derived classification to the APS-SF scores, which is often used by psychologists at YFPS, to assess various pathologies including substance abuse and dependence. Correlational analyses as well as multiple regression were conducted to validate the SASSI-A2 and the POSIT.

2.2 Sample

All youth who were admitted to YFPS on Vancouver Island, British Columbia in or after 2009, whose files were still active at the time of the data collection (April, 2012 through August, 2013), were considered as participants for this study. For participants who were admitted to the clinic more than once, the most recent admission data were collected. Aboriginal youth (those self-identified as so) were excluded from this study as sufficient Aboriginal community consultation was not possible, which rendered their inclusion in the study as unacceptable according to the Research Ethics Board (REB) at the University of Saskatchewan. Sixty-eight youth volunteered and were included in the study. Youth were admitted to the clinic as early as December 16, 2009. The most recent admission to the clinic was May 17, 2013. Some youth were admitted to the clinic more than once. For those participants, the most recent admission date was collected. Data were collected between April 19, 2012 and July 22, 2013. The average duration between admission date and data collection date was 5.50 (SD = 7.06) months. The range of duration was 0 to 28 months. Out of 68 participants, 56 participants (82.4%) were in community whereas 12 participants (17.6%) were in Victoria Youth Custody Services Centre in British Columbia.

The age of youth who participated in this study ranged from 13.41 years old to 18.92 years old with the average age of 16.05 years. Twenty four out of 68 or 35.3 percent of participants were 17 years old (mode). Eighteen out of 68 or 26.5 percent of them were 16 years old. Eighty two percent of youth who participated in this study were male (n = 56). Eighty four percent of participants were enrolled in school at the time of the data collection (n = 57). Only

nine youths did not attend or had dropped out of high school, and two youths graduated from high school at the time of the data collection. The range of last grade completed by participants was grade six to grade twelve. None was enrolled in post-secondary level. Since this study did not include Aboriginal youth, Caucasian was the most identified race by this group of youth. Approximately 80% of participants identified themselves as either Caucasian or White (n = 54). One youth identified as South East Asian, one identified as Latino, one identified as African or Black, and 11 participants identified as others (16.2%).

2.3 Measures

According to Winters (2003), there are four types of tools that assess substance use related behaviours. The first type are tools that assess alcohol use only; the second type are tools that assess drug use (other than alcohol) only; the third type are tools that assess all drug categories that include both alcohol and other drugs; and the fourth type are multiscreening tools that assess alcohol and other drugs as well as other problem domains. There were three different kind of measures in this study: assessment measures, a criterion measure, and other cognitive and achievement measures. Two types of tools utilized in this study as assessment measures were Adolescent Substance Abuse Subtle Screening Inventory (SASSI-A2; Miller, 1994), a type of tool that assesses all drugs categories, and Problem Oriented Screening Instrument for Teenagers (POSIT; National Institute on Drug Abuse, 1991), a type of tool that assesses all drug use and other problem areas. The Adolescent Psychopathology Scale - Short Form (Reynolds, 1998) provided a criterion measure of past alcohol and drug consumption. Other measures were two cognitive assessment measures and one academic measures: Wechsler Intelligence Scale for Children - Forth Edition (Wechsler, 2003, 2004), Wechsler Adult Intelligence Scale - Fourth Edition (Wechsler, 2008), and Woodcock-Johnson III Test of Achievement (Woodcock, McGrew & Mather, 2001, 2007).

2.3.1 Adolescent Substance Abuse Subtle Screening Inventory (SASSI-A2; Miller, 1994)

The Adolescent SASSI, the first version of this screening measure, was published in 1990 and has been used for many types of service programs such as addictions and other types of adolescent treatment programs as well as in correctional settings (Lazowski & Miller, 2001). The SASSI-A2 includes all items from the original SASSI along with 45 new items to improve the instrument's ability to identify individuals with substance dependence disorder and substance abuse disorders (Lazowski & Miller, 2001).

The SASSI-A2 is designed for adolescents 12 to 18 years of age. It is a brief self-report questionnaire, designed to identify individuals who have a high probability of having a substance use disorder, including both substance abuse and substance dependence. The SASSI-A2 also provides clinical insight into family and social risk factors, level of defensive responding, and consequences of substance misuse (SASSI Institute, n.d.). The measure includes both face valid and subtle items to identify individuals with alcohol and other drug problems who are unwilling or unable to acknowledge substance misuse or symptoms associated with it. The SASSI-A2 targets both inpatient and outpatient youth and is designed for criminal justice, employee assistance, education, mental health, medical, and vocational purposes (Assessing Alcohol Problems, 2003). It consists of 100 items that are divided into 12 subscales (i.e., nine basic subscales to classify the probability of having a substance use disorder, two additional scales to refine the test classification, and one scale to measure an extent to which the individual responds to the SASSI-A2 similarly to those youth involved with the justice system; Miller & Lazowski, 2005). The SASSI-A2 screens for substance abuse and substance dependence. First, the SASSI-A2 classifies adolescents in two groups: either having a high or low probability of a substance use disorder (Miller & Lazowski, 2005).

To obtain a dichotomous classification, numerical scores for each of nine scales (i.e., 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) are obtained. Further, there are nine rules that ask if a particular scale score exceeds empirically determined cut-offs. If any of those nine rules is answered “yes”, the youth has a high probability of having a substance use disorder. These decision rules have an overall accuracy rate of 94 percent (SASSI Institute, n.d.). If all nine rules are answered “no”, the youth has a low probability of having a substance use disorder (Miller & Lazowski, 2005). Even if a youth scored as having a low probability (zero score on nine decision rules), if the youth scored high on two other subscales (i.e., validity check and/or secondary classification scale), the youth is still referred for further assessment for substance abuse disorder (Miller & Lazowski, 2005). Thus, it is possible that a youth who is identified as having a low probability of having a substance use disorder may still be referred for a further clinical assessment and then diagnosed as having a substance abuse disorder. For youth who are identified as high probability, a cut-off value on one subscale (i.e., secondary classification scale)

is used to differentiate substance abuse from substance dependence (Miller & Lazowski, 2005; Feldstein & Miller, 2007).

The SASSI-A2 is an empirically validated measure that is designed for use as a screening instrument for substance use disorder (PAR, n.d.). A number of reliability (i.e., internal consistency and test-retest reliability) and validity (convergent, divergent, criterion-related validity) studies have been done on the SASSI-A2 (Feldstein & Miller, 2007). Lazowski and Miller (2001) conducted validation research on 2326 participants (1470 of them were from treatment and correctional settings in North America and 856 of them were from school settings and community youth programs) from 48 treatment and correctional programs and five school systems. The Adolescent SASSI-A2 was found to produce reliable results using a test-retest and internal consistency method (Lazowski & Miller, 2001). Test-retest stability coefficients for the scale used in SASSI-A2 ranged from .81 to .92 ($n = 70$, overall coefficient of .89). The overall alpha coefficient ranged from .63 to .95 (the overall internal consistency alpha coefficient was .75).

In addition, clinically derived diagnoses of DSM-IV substance dependence and substance abuse were used as criterion variables to validate the SASSI-A2 in its development (Miller & Lazowski, 2005). The level of accuracy in distinguishing substance abusing and substance dependent respondents from those without a substance use disorder obtained from Lazowski and Miller's overall samples was 95%. Lazowski and Miller (2001) found that the overall sensitivity of the SASSI-A2 (the percentage of respondents diagnosed as having a substance dependence or substance abuse disorder who were tested positive on the SASSI-A2) was 95%. The sensitivity for identifying adolescents with substance abuse was 91% and for substance dependence, it was 98% (Lazowski & Miller, 2001). The overall specificity (the percentage of respondents diagnosed as not having a substance abuse or substance dependence disorder who tested negative on the SASSI-A2) was 89%.

The accuracy of the SASSI-A2 was not significantly affected by youth's gender, age, ethnicity, education, employment status, living situation, or prior history of law violation (Lazowski & Miller, 2001). These findings clearly indicated that the SASSI-A2 and the clinical diagnosis of substance abuse and substance dependence are highly related (Lazowski & Miller, 2001).

2.3.2 Problem Oriented Screening Instrument for Teenagers (POSIT; National Institute on Drug Abuse, 1991.)

The POSIT is a brief screening tool designed to identify problems that require a further in-depth evaluation for need of potential treatment for adolescents 12 to 18 years of age. There are 139 items in 10 subscale problem areas: Substance Use and Abuse, Physical Health, Mental Health, Family Relations, Peer Relations, Educational Status, Vocational Status, Social Skills, Leisure/Recreation, and Aggressive Behaviour/Delinquency.

A number of reliability and validity studies have been conducted on the POSIT. The POSIT is an empirically validated measure and has produced reliable results in test-retest and internal consistency studies. Knight, Goodman, Pulerwitz, and DuRant (2001) conducted a reliability test by examining the internal consistency and one-week test-retest reliability on the POSIT. The Substance Use and Abuse and other subscales (i.e., Mental Health, Vocational Status, Educational Status, and Aggressive Behaviour/Delinquency) had $\alpha = .70$ or higher. Kappa coefficients for all scales were between .42 and .73, which indicates good reproducibility beyond chance. Latimer, Winters, and Stinchfield (1997) examined the ability of POSIT to identify a substance abuse disorder. They found evidence of reliability and criterion-related validity ($\alpha = .92$ and $r = .58$ to $.81$, respectively). Further, the POSIT has been shown to have good reliability and convergent validity with other relevant instruments (Danesco & Marques, 2002). For example, McLaney, Del Boca, and Babor (1994) examined the reliability and validity of the POSIT by examining convergent and discriminant validity using the Personal Experience Inventory (PEI, Winters & Henly, 1989), the Diagnostic Interview for Children and Adolescents, and the Adolescent Diagnostic Interview (ADI, 1991). They found that the criterion measures and the POSIT scores were correlated with the pattern of correlations between the POSIT and the PEI scales successfully demonstrating convergent and discriminant validity (i.e., a pattern of high correlations for similar functional areas and lower correlations with dissimilar functional areas). According to Danesco and Marques (2002), studies that utilized the POSIT on community, clinic and juvenile offender samples have consistently found high internal consistency and validity with other substance use/abuse scales. Hall, Richardson, Spears, and Rembert (1998) also conducted a validation study of the POSIT. They found support for criterion related validity by comparing scores of all ten subscales on two known groups (substance users and abstainers). Their concurrent validity test was also supported when they

compared the POSIT scores and self-reported drug use with all ten domains. For their construct validity test, Hall et al. (1998) found very strong convergent validity for substance use, mental health, and aggressive behaviour/delinquency subscales. Finally, they demonstrated the POSIT's discriminant validity with nonsignificant associations with unrelated variables for all ten domains (Hall et al., 1998).

2.3.3 Wechsler Adult Intelligence Scale - Fourth Edition: Canadian (Wechsler, 2008, WAIS-IV)

The Wechsler Adult Intelligence Scale Fourth Edition (WAIS-IV, Wechsler, 2008) measures cognitive ability in adults. The WAIS-IV yields full scale IQ (FSIQ) and four index scores: verbal comprehension, perceptual reasoning, working memory, and processing speed. There are 15 subtests (10 core subtests and 5 extra). FSIQ is obtained based on scores from 10 core subtests. Wechsler (2008) stated that the reliability for the WAIS-IV is very high. Wechsler conducted split-half reliability for FSIQ with results of $r = .98$ (2008). All subtest split-half reliabilities resulted in $r = .81$ or higher except one subtest, Cancellation, which was not included in the core 10 subtests. In addition, test-retest reliability for the FSIQ was $r = .96$, and the composite scores were from $r = .87$ to $.96$. Extensive validity studies have also been conducted on a previous version of the WAIS, the WAIS-III. There was a very strong correlation between WAIS-III and WAIS-IV FSIQ, which was $r = .94$.

2.3.4 Wechsler Intelligence Scale for Children - Fourth Edition: Canadian (Wechsler, 2003, 2004, WISC-IV)

The Wechsler Intelligence Scale for Children - Fourth Edition (WISC-IV, Wechsler, 2003 & 2004) measures cognitive ability in children and adolescents. The internal consistency reported in the manual for the full scale IQ ranges from $r = .96$ to $.97$. The mean internal consistencies for the individual index scores range from $r = .91$ to $.92$ (Groth-Marnat, 2009). The four index test-retest reliabilities range from $r = .79$ to $.89$. The average test-retest reliability for subtests range from $r = .68$ to $.85$. In addition, criterion-related validity has been performed on other psychological assessments, and the results were, in general, positive (Groth-Marnat, 2009).

2.3.5 Woodcock-Johnson III Battery: WJ III Tests of Achievement, Form B (Woodcock, McGrew, & Mather, 2001, 2007, WJ-III)

The Woodcock-Johnson III Tests of Achievement (WJ-III Test of Ach, Woodcock, McGrew, & Mather, 2001 & 2007) is designed to diagnose learning disabilities, determine

learning variations, plan educational programs, and assess individual strengths and weaknesses (Riverside Publishing, n.d.). It is divided into two batteries: Standard and Extended. The Standard Battery includes 12 subtests that provide a basic knowledge of a youth's achievement. The Extended Battery includes 10 subtests that provide in-depth diagnostic information on specific academic strengths and weaknesses (Nelson, n.d.). The WJ III measures three kinds of fluency: reading, math, and writing, and an overall index of academic fluency. In addition, ability and achievement discrepancy can be examined (Nelson, n.d.).

2.3.6 Adolescent Psychopathology Scale Short Form (Reynolds, 1998, APS-SF)

The Adolescent Psychopathology Scale Short Form (APS-SF, Reynolds, 1998) is a self-report scale to assess adolescents' (age 12-19) psychopathology, personality, and social-emotional problems. It is designed to assess psychological disorders, distress and behaviours that may interfere with a youth's psychological adaptation and personal competence (Reynolds, 1998). This is a paper-pencil, self-report questionnaire. The responses are entered into the scoring program, and the software calculates scores and automatically produces a report based on the appropriate normative comparison group (Reynolds, 1998). The APS-SF has been used in both clinical and non-clinical environments, such as youth custody centre programs and substance abuse treatment programs (Articles & Summaries in Economics, 2011). It is utilized as a method to measure treatment outcomes and determines the effectiveness of treatment plans (Articles & Summaries in Economics, 2011).

The APS-SF (short form) includes 115 items in 12 clinical scales (i.e., Conduct Disorder, Oppositional Defiance Disorder, Substance Abuse Disorder, Anger/Violence Proneness, Academic Problems, Generalized Anxiety Disorder, Posttraumatic stress Disorder, Major Depression, Eating Disturbance, Suicide, Self-Concept, and Interpersonal Problems) and two response validity scales (i.e., Defensiveness and Inconsistency). The APS-SF requires 15 to 20 minutes to administer.

The content and criterion-related validity of the APS-SF have been assessed. The contribution of single items to the scale (item and total scale correlation) was examined as a means to assess content validity. Individual item correlation coefficients with the total scale were between .40 and .70 (Articles & Summaries in Economics, 2011). Criterion-related validity was demonstrated by examining the MMPI and APS-SF, with correlations between .20 and .70 (Articles & Summaries in Economics, 2011). Internal consistency reliability in

standardized sample ranged from .80 to .91, and test-retest reliability for clinical scales ranged from .76 to .91 (Articles & Summaries in Economics, 2011).

2.4 Structured Interview

In-person interviews were conducted following administration of the SASSI-A2 and POSIT. Interview questions were designed to help the researcher fully understand a youth's substance-related behaviour prior to his or her involvement with YFPS as well as current substance-related behaviour. This allowed the researcher to compare youths' substance use behaviour before and after their involvement with YFPS. Also, interview items included questions on treatment and criminogenic needs that were not available from the youth's files. Substance use treatment information was taken into consideration when the change in substance use behaviour (pre-post involvement with YFPS) and the relationship between SASSI-A2/POSIT and APS-SF: SUB were analyzed.

Examples of questions included: Do you use drugs? How often? What kind? Do you consume alcohol? How often? What kind? How much did you drink (use drugs) before coming to YFPS, and after coming into YFPS? Has your alcohol [your drug] use increased/decreased after your involvement with YFPS?; and How long have you been abstinent from alcohol [drugs]? The interview guide may be found in Appendix G.

2.5 File Review

File reviews were conducted at various YFPS Vancouver Island clinics. Collected variables included age, age at first substance use, age at first criminal offence, criminal history, index offence, substance use while committing index offence (yes/no), family, peer, education, substance use (current and history), and substance use treatment (i.e. referral, received, completed).

2.6 Definitions:

2.6.1 Substance Abuse in DSM-IV

Aside from a number of specific drug abuse and drug dependence diagnoses (i.e., substance intoxication, substance withdrawal, substance induced mental disorder, alcohol intoxication, alcohol withdrawal, amphetamine, caffeine related disorder, cannabis-related disorder), substance abuse and substance dependence are the primary alcohol and drug related terms that have been officially recognized in *the Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV; American Psychiatric Association (APA), 2000). According to the DSM-

IV, a substance abuser is a person who encounters negative social or interpersonal consequences as a result of recurrent substance use. A person with substance dependence is one who has a maladaptive pattern of alcohol use that leads to clinically significant impairment or distress manifested by increased tolerance to the substance or symptoms of withdrawal upon the termination of the substance use, and as a result he or she becomes preoccupied with activities to obtain alcohol, use alcohol, or recover from its effect and gives up social, occupational or recreational activities (DSM-IV-TR; APA, 2000). Substance addiction is not used in the DSM-IV to describe substance abuse or dependence behaviour

Further, the DSM-IV specifies that an individual has an alcohol abuse disorder if he or she meets one or more of the following criteria over a one year period: 1) Role impairment (failed work or home obligations), 2) hazardous use (driving, swimming, or operating machinery while intoxicated), 3) experienced legal problems related to alcohol use, and 4) experienced social or interpersonal problems due to alcohol use (American Psychiatric Association, 2000).¹

2.6.2 Young Offender

Next, terms such as youth offenders, young offenders, juvenile offenders, juvenile delinquents, and youthful offenders are all used to refer to younger offenders. Although often used interchangeably, “youthful offenders” refers to young offenders and young adults (i.e., offenders under the age of 25 years old). In the U.S., either juvenile offenders or juvenile delinquents is frequently used instead of young offenders. In Canada, young offenders are operationalized as youth who have committed criminal offence while they were between 12 and 17 years old as per the *Youth Criminal Justice Act (YCJA; The Youth Criminal Justice Act, Province of British Columbia, 2011)*. In British Columbia, young offenders who need assessment and/or treatment are referred to YFPS. Further, youth who turn 18 before their trial or sentencing are still tried or sentenced as youth under the *YCJA* with some exceptions (*The Youth Criminal Justice Act, Province of British Columbia, 2011*). Therefore, young offenders between the age of 12 and 18 were included in this study.

¹ The DSM-5 (APA, 2013) has substantially simplified alcohol and drug diagnoses, and it does no longer differentiate between abuse and dependence. However, the data collection began prior to the release of DSM-5 (APA 2013). Therefore, the DSM-IV TR (APA, 2000) is used to define substance use problems in this study.

2.6.3 Types of Validity

Since there are numerous types and definitions of validity, some of which have changed over time, and this is essentially a validity study, the following description is offered. Cronbach (1971) asserted that validation is a process that is used to collect empirical evidence and theoretical consideration that supports the interpretation of test scores. Similarly, according to Messick (1989), validity is “an integrated evaluative judgement of the degree to which empirical evidence and theoretical rationales support the adequacy and appropriateness of inferences and actions based on test scores or other modes of assessment” (as cited in Borsboom, Mellenbergh, & Heerden, 2004, p.13).

The American Psychological Association (1954) introduced four types of validity. However, in 1966, it reduced concurrent and predictive validity into a single category as criterion-related validity (Stapleton, 1997). Crocker and Algina (1986) discussed three types of validity: content validity, criterion-related validity, and construct validity. They further stated that both predictive validity and concurrent validity were types of criterion-related validity. According to Cronbach and Meehl (1955), if the criterion is obtained after a test score, the researcher is investigating predictive validity. If the criterion and a test score are obtained relatively at the same time, a researcher is studying concurrent validity.

According to the APA (1954), concurrent validity can be evaluated by showing how well test scores correspond to a measure of criterion performance or status, and studies which examine whether a test discriminates between presently identifiable groups was concerned with concurrent validity. Trochim (2006) stated that criterion-related validity is meant to measure the performance of some construct against some criterion. In other words, concurrent validity is demonstrated where a test correlates well with a measure that has previously been validated. Cronbach and Meehl (1955) stated that concurrent validity is examined when one test is used as a substitute for another or a test is shown to correlate with some criterion. Further, Feldstein and Miller (2007), in their examination of the criterion-related validity of the SASSI, used a substance use disorder diagnosis by a clinical or computer-based interview as the ‘gold standard’ to measure the SASSI’s validity.

In the current study, a T-score of the APS-SF: SUB was considered the criterion (Stracker, n.d.). Since two test measures of interest (i.e., the SASSI-A2 and the POSIT) were administered after youths were diagnosed or while the initial assessment was on going, the

criterion-related validity of the SASSI-A2 and the POSIT were assessed against a T-score of the APS-SF: SUB. Therefore, if a significant relationship exists between the criterion (T-score of the APS-SF: SUB) and test scores (SASSI-A2 or POSIT), the results would demonstrate concurrent validity.

Campbell and Fiske (1959) declared that both convergent and discriminant validity are required to justify a novel trait, validate interpretation, and to establish construct validity. Moreover, discriminant validity is as important as convergent validity because one cannot define anything without properly defining distinction. Therefore, verification of such distinctions is an important process of establishing construct validity (Campbell & Fiske, 1959). Tests may be invalid if significantly high correlations are found between a test of interest and other tests that are intended to measure different constructs. Thus, low correlation between tests that measure different traits is evidence of discriminant validity.

Similarly, Feldstein and Miller (2007) stated that a good instrument should correlate significantly with other measures of the same construct, and it should not correlate significantly with demographics or measures of other constructs. The SASSI manuals emphasized relative independence of SASSI scores from factors such as age, ethnicity, comorbidity, and general functioning (Feldstein & Miller, 2007). If this is the case, the SASSI-A2 should not significantly correlate with such variables or other scales that measure different constructs.

Convergent validity reflects the extent to which two measures capture a similar underlying construct (Carlson & Herdman, 2010). When measures of two constructs that are supposed to be theoretically related to each other are, in fact, shown to be related to each other (i.e., if one can demonstrate the correspondence between two constructs), one can say that convergent validity occurs (Trochim, 2006). Campbell and Fiske (1959) stated that both reliability and validity require agreement between two measures and what differs between reliability and validity is that reliability pertains to the agreement between two measures that measure the same traits through similar methods, whereas validity is demonstrated by the agreement between two measures that measure the same traits through different methods (p.83). Thus, convergent validity is measured by comparing a measure to other measures of the same concept developed through other methods. The correlation between two measures is evidence of convergent validity.

Feldstein and Miller (2007) asserted that “screening instruments for the same disorder are expected to show a high degree of convergence” (p. 44). They reported that SASSI classifications have been found to converge with those from other screening instruments that measure substance use disorder directly. For example, Feldstein and Miller (2007) found high convergence with the Cut-down, Annoyed, Guilt, Eye-opener (CAGE) with a kappa value of 0.61 and a correlation of $r = 0.40$, and $r = 0.58$ with a modified CAGE, MAST with a kappa value of 0.52 and a correlation of $r = 0.53$, and the Rutgers Alcohol Problem Index with a correlation of $r = 0.43$ (Laux, Salyers, & Kotova, 2005; Myerholtz & Rosenberg, 1998).

In the current study, the researcher used Feldstein and Miller’s definition of convergent validity. If a significant correlation between scores from the SASSI-A2 and scores from the POSIT were demonstrated, convergent validity would be evident.

Further, the substance use and abuse scale of the POSIT and the SASSI-A2 were examined against the non-substance use and abuse scales of the POSIT, such as physical health, and vocational status, and leisure and recreation subscales. McLaney, Del Boca, and Babor (1994) conducted a validation study of the POSIT. They found a high correlation between the substance use and abuse scale of the POSIT and the total score of the POSIT, $r = .86$. Therefore, one acknowledges that other subscales from the POSIT may not be good candidates for finding discriminant validity. However, McLaney et al. (1994) found a lower correlation between the Physical Health subscale and the total score of the POSIT of .44. In addition, the Vocational Status subscale and Leisure and Recreation subscale have lower correlations with the total score of the POSIT, .59 and .56, respectively (McLaney et al., 1994). Therefore, the Physical Health, Vocational Status, and Leisure and Recreation subscales were used in the current study. Although McLaney et al. (1994) found a low correlation between the Social Skill subscale and the total score of the POSIT, they also found that Social Skills, Mental Health, Educational Status and Aggressive Behavior and Delinquency subscales were highly correlated with one another. Therefore, the Social Skills may not be a good candidate for testing discriminant validity. They noted that one reason those subscales were highly correlated with one another was that some items in these subscales are shared by more than one subscale (McLaney et al., 1994). However, McLaney et al., (1994) did not provide inter-correlations between subscales, and using subscales of the POSIT is less ideal means of testing discriminant validity since the substance use and abuse subscales have high correlations with the total score of the POSIT.

McLaney et al. (1994) used the Personal Experience Inventory (PEI), which measures multiple dimensions of substance-related problems, to test convergent and discriminant validity. Similar to McLaney et al.'s method, the current study was designed to test discriminant validity. The substance use and abuse subscale of the POSIT and the SASSI-A2 were also examined against IQ and academic achievement test scores as an examination of discriminant validity. These subscales are conceptually unrelated to substance use, so correlations are expected to be low.

Psychologists and psychiatrists at YFPS often defer diagnosing clients until their discharge. Therefore, it was not possible to obtain DSM diagnosis by psychologists or psychiatrists for the current study. When psychologists diagnose clients at YFPS, they often use the APS-SF or similar measures in addition to information they gather during interviews with the youth. For this reason, the APS-SF: SUB T-score was used as the substance use problem diagnosis.

2.7 Procedure:

2.7.1 First Step: Participant Recruitment and Consent

First, potential participants were identified from the list of active cases of YFPS by a researcher. At this selection stage, the researcher had very basic information on youth (name, contact information, and ethnicity). Contact information was necessary for the researcher to contact youths' parents or guardians to obtain their approval to contact their children.

Second, the researcher contacted parents of potential participants from the list and asked if they agreed to have the researcher contact their children to invite them to participate in the study. Parents or guardians gave their consent over the phone or in-person. If the consent was given over the phone, the parent/guardian consent script was read and filled it in on behalf of parents or guardians. The researcher did not approach youths to discuss this study until their parents or guardians agreed.

Third, YFPS clinicians (psychologists, psychiatrists, social workers, nurses, and testing assistants) introduced this study to youth whose parents or guardian agreed. Clinicians were provided with a description of study by the researcher, so all clinicians had the same information to explain to their clients. At this stage, participants were provided with a youth contact script. Youth who were interested in participating or wanted to know more about the study could fill in the check box beside "yes" on the youth contact script. This meant that youth allowed clinicians

to give their names and contact numbers to the researcher to discuss the project further. If youth were not interested in participating in the study, they could fill in the check box beside “no” on the youth contact script. Only those who answer “yes” were included as a pool of participants whom the researcher contacted directly for the study.

When youth visited YFPS clinics for their treatment sessions, the researcher entered the room after youth finished the session with clinicians. After clinicians left the room, the researcher and youth discussed in private what the project entailed. The researcher explained the risks and benefits that might be associated with the study. The researcher ensured that youth understood the nature of the study and that they were free to participate or not. After the researcher was confident that the youth understood what they would be involved in, the researcher asked the youth if he or she wanted to participate in the study. During this time, the researcher emphasized that participation in the study was completely voluntary, that any decision to participate or not would not affect their probation status, that there would be no penalty for not participating, and that staff would not be informed if a youth decided to participate or not. Once a youth decided to participate, he or she signed the assent form. On the consent form, youth were asked if they gave permission to the researcher to access their files at YFPS and if they were willing to participate in the study involving interview and psychometric surveys.

2.7.2 Second Step: Test administration and Structured Interview

Once youth signed the form, the researcher proceeded with the administration of the SASSI-A2 and the POSIT. In order to avoid questions on one measure affecting responses to the second measure, half of the participants started with the SASSI-A2, while the other half started with the POSIT (administration of the forms was counterbalanced). After youth completed the SASSI-A2 and the POSIT, the researcher administered the APS-SF to youth who had not previously completed the APS-SF during their intake assessment at YFPS. Fifty-two (76.5%) of the APS-SF were administered by the researcher, and 16 (23.5%) of the APS-SF were administered by clinicians at YFPS. The APS-SF was administered at last regardless of the order of first two measures. After all surveys were completed, the researcher conducted a structured interview. The interview included questions about substance use related behaviours (see Appendix G). When a youth chose not to participate, he or she was free to leave at any time. After a youth completed the SASSI-A2 and the POSIT as well as the structured interview with

the researcher, he or she received a ten dollar gift card for Subway, Tim Hortons, or Walmart as a token of appreciation.

The researcher scored the SASSI-A2 and the POSIT by hand, and the information collected during the structured interview was coded. Based on scores on the nine subscales on the SASSI-A2, nine decision rules on the SASSI-A2 were either endorsed or not endorsed. If a youth scored one or more on the nine decision rules on the SASSI-A2, he or she was identified as having a high probability of substance use disorder. If a youth scored zero on the nine decision rules on the SASSI-A2, he or she was identified as having a low probability of substance use disorder. If a youth identified as having a low probability and scored five or more on the validity check or 16 or more on the secondary classification scale of the SASSI-A2, his or her test was declared invalid since further assessment for substance abuse disorder is required (Miller & Lazowski, 2005). If a youth scored one or more on the substance use and abuse scale on the POSIT, he or she was considered at risk for having a substance abuse disorder (Feldstein & Miller, 2007).

Next, the researcher scored the APS-SF. If a youth had already completed the APS-SF, the scores had been entered in the database at YFPS. Therefore, the researcher collected the data during the file review phase. Then all data were entered into an SPSS database for statistical analysis.

2.7.3 Third step: File review

The researcher conducted file reviews to collect relevant information. This included scores from measures that had been completed by youth prior to this project (i.e., WAIS or WISC scores, WJ-III scores, and APS-SF) and demographic information such as age, gender, ethnicity, education, and time elapse between admission and data collection date. Then, the data were coded and entered into the SPSS database for quantitative analysis.

Participants could be expected to show some reduction in substance use following their admission to YFPS since they were on probation, could have had a court order not to use substance, and may have received treatment, such as sexual offender treatment, violence offender treatment, or general mental health and behavioural treatment. Some participants received substance use treatment in the form of residential treatment, outpatient individual counselling, or group sessions outside YFPS. Those who received and completed substance use

treatment should show a greater reduction in self-report substance usage than those who did not receive substance use treatment.

2.8 Hypotheses

- 1) It was hypothesized that there would be no difference in the alcohol or drug consumption of males and females. (This was tested by chi-squares).
- 2) It was hypothesized that age would be positively correlated with alcohol and drug consumption. (This was tested by Pearson correlation).
- 3) It was hypothesized that IQ (WAIS-IV and WISC-IV) and academic achievement (WJ-III ACH) would not be correlated with self-reported alcohol and drug usage at pre and post YFPS admission, SASSI-A2 FVA and FVOD T-scores, POSIT A raw score and APS-SF SUB T-scores. (This was tested by Pearson correlation).
- 4) It was hypothesized that SASSI-A2 subscale FVA and FVOD T scores, POSIT subscale A (Substance use/abuse risk scale) raw score, and APS-SF subscale SUB T score would be correlated. (These were examined in a Pearson correlation matrix).
- 5) It was hypothesized that other risk factors raw scores on POSIT (9 subscales) would be positively correlated with the APS-SF: SUB T-score, SASSI-A2 FVA and FVOD T-scores, and SASSI-A2 summary scale raw score. (These were examined in a Pearson correlation matrix).
- 6) It was hypothesized that other risk factors T-scores on APS-SF would be positively correlated with the POSIT A raw score and SASSI FVA and FVOD T-scores and APS-SF: SUB T-score. (This was tested by Pearson correlation).
- 7) It was hypothesized that POSIT A and APS-SF: SUB would be more highly correlated with than SASSI-A2 FVA and FVOD would be correlated with either POSIT A or APS-SF: SUB because SASSI-A2 measures alcohol and drugs separately whereas POSIT and APS-SF combine alcohol and drug into one scale. (This was tested by Pearson correlation).
- 8) It was hypothesized that pre YFPS admission alcohol use amount and frequency would be positively correlated with post YFPS admission alcohol use amount and frequency. (This was tested by Pearson correlation).
- 9) It was hypothesized that self-reported post YFPS alcohol use would be lower than pre YFPS alcohol use. It was also hypothesized that there would be a greater reduction in post-

admission alcohol use from pre-admission alcohol use by youth who received treatment than youth who did not receive treatment. (These were tested by t-tests).

- 10) It was hypothesized that pre YFPS admission drug use frequency would be positively correlated with post YFPS admission drug use frequency. (This was tested by Pearson correlation).
- 11) It was hypothesized that self-reported post YFPS drug use would be lower than pre YFPS drug use. It was also hypothesized that there is a greater reduction in post-admission drug use from pre-admission drug use by youth who received treatment than youth who did not receive treatment. (These were tested by t-tests)
- 12) It was hypothesized that POSIT, SASSI-A2 and APS-SF scores would be correlated with pre YFPS admission self-report alcohol and drug usage. (This was tested by Pearson correlation).
- 13) It was hypothesized that SASSI-A2 FVA and FVOD, APS-SF: SUB, and POSIT would predict how much substance usage is self-reported in interview (alcohol and drug together). (This was tested by Multiple Regression).
- 14) It was hypothesized that scores on physical health, mental health, peer relations, family relations, leisure and recreation, and social skills in POSIT and Family-Friends in SASSI-A2 would predict reduction in alcohol and drug use. (This was tested by Multiple Regression).

2.8.1 Research Questions (no a priori hypotheses):

A number of exploratory research questions were also posed.

1. Which measures, SASSI-A2 or POSIT, produce results closer to the results of Substance Abuse Disorder score on the APS-SF? Results from the SASSI-A2 were categorized into three groups: no substance abuse, substance abuse, substance dependence; results from the APS-SF were categorized into four groups: subclinical symptom, mild clinical symptom, moderate clinical symptom, and severe clinical symptom; and results from the POSIT were categorized into three groups: low risk, medium risk, and high risk.
2. Can a pre-admission alcohol and drug use measure and participation in treatment predict change in alcohol and drug use?

2.9 Statistical Analysis:

2.9.1 Step one: Descriptive statistics (Correlations and Chi-square)

First, descriptive analyses were conducted using demographic variables and scores from substance use measurements. The object of this step was to acquire an accurate description of the

young offenders who were referred to YFPS and the extent of their substance use and abuse problems.

2.9.2 Step two: Validity (Correlations and Multiple Regression)

Next, convergent validity was examined. The first step of this analysis was to examine convergent validity of the SASSI-A2, the POSIT, and the APS-SF. Pearson correlations were conducted to examine the relationships between the SASSI-A2 scores, the POSIT scores, and APS-SF scores. Significant relationships among these three measures scores would provide evidence of convergent validity among these three measures.

Further analyses were conducted to determine if there was significant difference between correlations (i.e., between SASSI-A2 FVA and FVOD scores and the APS-SF: SUB T-score and POSIT and the APS-SF: SUB T-score). A significant difference would indicate that one test identifies substance use problems better than the other measure.

Criterion-related validity was examined by multiple regression. The criterion variable was substance usage which was self-reported in the interview. Predictor variables were SASSI-A2 FVA and FVOD, APS-SF: SUB, and POSIT scores. Multiple regression analysis was conducted to determine what instrument best postdicted substance usage.

Self-reported substance usage and pre- and post-admission to YFPS was also analyzed. The researcher conducted analyses to determine if a reduction in self-reported usage was correlated with other subscales in POSIT and SASSI-A2, such as Peer and Family Relationships, Physical Health, Mental Health, Leisure and Recreation, and Social Skills. This was followed up with multiple regression analyses on these variables.

Convergent validity was examined by correlations. POSIT/SASSI-A2 and APS-SF scores were correlated with pre YFPS admission self-report substance usage. A multiple regression analysis was also conducted to determine if the components of the POSIT and SASSI-A2 jointly predicted self-reported substance use change.

Analyses in this study were conducted by parametric tests which have various assumptions. For instance, a basic assumption of χ^2 deals with the independence of observations, and it is the assumption that one participant's score has no effect on another participant's score (an assumption of independence; Howell, 2007). Another example is that one of the assumptions underlying the *t*-test for two independent sample is the assumption of homogeneity of variance

(Howell, p.201, 2007). These statistical tests are considered robust to minor violations of their statistical assumptions (Box, 1953). Add reference

2.9.3 Statistical Significance and Strength of Relationships

All results were examined in terms of statistical significance level $p < .05$. Strengths of relationships as measured by correlation which is an indication of effect size were examined and considered for the interpretation of results as well. Effect sizes in this study were interpreted by the cut-off that Cohen (1988) suggested: small $\leq .10$, medium $\leq .30$, and large $\leq .50$.

3.0 RESULTS

This chapter consists of two sections. The first section describes sample demographics particularly as they pertain to current and past alcohol and drug usage, living situation, abuse history, and offense history (age, type of first offence, incarceration, and index offence substance use). Under the section of sample demographics, subsections such as age, race, and gender are presented. The second section examines the convergent validity among the SASSI-A2 FVA and FVOD, the POSIT A, and the APS-SF SUB (substance scales) and the criterion-related validity of the SASSI-A2, POSIT, and APS-SF substance scales.

3.1 Offender Demographic and Alcohol and Drug History

3.1.1 *Substance Use*

Ninety-one percent of youth reported having consumed alcohol at least once in their lives ($n = 62$). The mean age of alcohol initiation was 12.27 ($SD = 2.64$) years. The youngest alcohol initiation age was six years old, and the oldest was 17 years old.

Ninety percent of youth indicated that they had used drugs at least once in their lives ($n = 61$). The mean age of drug initiation was 12.26 ($SD = 2.36$) years. The youngest age of alcohol initiation was five years old, and the oldest was 17 years old. A paired sample t-test was conducted to examine if there was a significant difference between alcohol and drug initiation age within each participant. A two tailed t-test on alcohol and drug initiation age difference was not statistically significant ($t(60) = .000, p = 1.000$), revealing that on average the participants consumed alcohol and used drugs at about the same age for the first time. The correlation between alcohol and drug initiation age was $r = .334, p = .009$.

3.1.2 *Past alcohol and drug usage*

Participants were asked about their frequency of alcohol and drug consumption before their involvement with YFPS. Sixteen participants (23.5%) responded that they did not drink at all; 15 (22.1%) responded that they consumed alcohol once a month or less; 11 (16.2%) responded they consumed alcohol two to three times a month; 12 (17.6%) responded they consumed alcohol once or twice a week; five (7.4%) responded they consumed alcohol three to four times a week; seven (10.3%) responded they consumed alcohol nearly every day; and two (2.9%) responded they have consumed alcohol once a day or more. This showed that the majority of youth participating in this study consumed alcohol occasionally (79.4% of participants consumed alcohol once or twice a week or less).

Twelve participants (17.6%) responded they did not use drugs at all; four (5.9%) responded they used once a month or less; three (4.4%) responded that they used two or three times a month; four (5.9%) responded they used once or twice a week; 10 (14.7%) responded they used three to four times a week; 14 (20.6%) responded they used nearly every day; and 21 (30.9%) responded they used once a day or more. In other words, more than half of youth participated in this study (51.5%) used drugs on a daily basis.

3.1.3 Current alcohol and drug usage

Participants were asked about their current use of alcohol and drugs. Out of 68 participants, 37 of them (54.4%) responded that they used alcohol, and 46 of them (67.6%) responded that they have used drugs since their involvement with YFPS. Participants were asked about the frequency of their alcohol and drug consumption since their involvement with YFPS. Thirty-three participants (48.5%) responded that they did not drink at all; 15 of them (22.1%) responded that they consumed once a month or less; 12 responded (17.6%) responded that they consumed two to three times a month; six responded (8.8%) that they consumed once or twice a week; and two responded (2.9%) that they consumed three to four times a week. None of them responded they consumed on a daily basis. Therefore, the majority of participants (70.6%) consumed alcohol only on occasion or not at all.

Twenty three participants (33.8%) reported that they did not use drugs at all; eight of (11.8%) responded that they used once a month or less; four (5.9%) responded that they used two to three times a month; six responded (8.8%) that they used once or twice a week; seven responded (10.3%) that they used three to four times a week; eight (11.8%) responded that they used nearly every day; and 12 (17.6%) responded that they used once a day or more. Therefore, nearly half of the participants (45.6%) used drugs on occasion, and 29.4% of them were daily drug users.

3.1.4 Past and current alcohol and drug usage

3.1.4.1 Alcohol Use

A paired t-test was conducted to examine the difference between pre YFPS admission and post YFPS admission self-reported alcohol usage. As hypothesized, there was significant difference between pre and post YFPS admission usage, $t(67) = 5.209, p = .001$. This indicated that youth showed a significant reduction in alcohol use after being admitted to YFPS compared to alcohol usage before the admission to YFPS.

An independent t-test was also conducted to examine if youth who received treatment showed a greater reduction in alcohol usage at post-admission than youth who did not receive treatment. The group which received treatment showed a larger decrease in alcohol use ($M = 1.53$; $SD = 1.84$) than the non-treatment group ($M = .96$; $SD = 1.71$). However, the reduction in alcohol use for the treatment group was not statistically greater than that of the non-treatment group, $t(66) = -1.166$, $p = .248$.

Another independent t-test was conducted to examine if youth in custody showed a greater reduction in alcohol usage at post-admission than youth in community. The youth in custody showed a larger decrease in alcohol use ($M = 1.92$, $SD = 1.68$) than the youth in community ($M = .929$, $SD = 1.73$). However, the reduction in alcohol use for the youth in custody was not statistically greater than that of the youth in community, $t(66) = -1.809$, $p = .075$.

Pearson product-moment correlation coefficients were conducted to examine the relationship between the pre-admission to YFPS alcohol use amount and frequency and the post-admission to YFPS alcohol use amount and frequency (see Table 1). As hypothesized, the pre-admission alcohol use amount and frequency were positively correlated with the post-admission alcohol use amount and frequency. The correlation between alcohol use frequency pre-admission and post-admission alcohol use frequency was $r = .330$, $p = .006$. The correlation between alcohol consumption amount pre-admission and alcohol consumption post-admission was $r = .500$, $p = .001$. The correlation between alcohol use frequency pre-admission and alcohol use amount pre-admission was $r = .587$, $p = .001$. The correlation between alcohol use frequency pre-admission and alcohol consumption amount post-admission was not statistically significant ($r = .124$, $p = .313$).

Table 1.

Correlations between pre and post YFPS admission alcohol and drug use frequency and consumption amount

	AlcAmo Pre	Drug Fre Pre	AlcFre Post	AlcAmo Post	Drug Fre Post
AlcFre Pre	.587***	.571***	.330**	.124	.168
AlcAmo Pre		.607***	.384***	.500***	.496***
Drug Fre Pre			.183	.230	.556***
AlcFre Post				.680***	.451***
AlcAmo Post					.560***

Note: AlcFrePre= Alcohol use frequency pre-admission; AlcAmoPre= Alcohol consumption amount pre-admission; Drug Fre Pre= Drug use frequency pre-admission; AlcFre Post= Alcohol use frequency post-admission; AlcAmo Post= Alcohol consumption amount post-admission; and Drug Fre Post= Drug use frequency post-admission.

*** $p < .001$; ** $p < .01$

3.1.4.2 Drug Use

Pearson product-moment correlation coefficients were conducted to examine the relationship between the pre-admission to YFPS drug use and the post-admission to YFPS drug use (see Table 1). As hypothesized, drug consumption before the admission to YFPS was positively correlated with post-admission drug consumption, $r = .556$, $p = .001$.

A paired t-test was conducted to examine the difference between self-reported drug usage before the admission to YFPS and post-admission to YFPS. As hypothesized, there was significant reduction in drug usage from pre- to post-admission to YFPS, $t(67) = 4.674$, $p = .001$.

An independent t-test was also conducted to examine if youth who had received treatment showed a greater reduction in drug usage at post-admission to YFPS than youth who did not receive treatment. The treatment group ($M = 1.59$; $SD = 2.55$) showed a greater reduction in drug usage than the non-treatment group ($M = 1.12$; $SD = 2.06$). However, the difference was not statistically significant, $t(66) = -.769$, $p = .445$.

Another independent t-test was conducted to examine if youth in custody showed a greater reduction in drug usage at post-admission than youth in community. The youth in custody ($M = 2.50$, $SD = 2.65$) showed a greater reduction in drug usage at post-admission to

YFPS than the youth in community ($M = .96$, $SD = 1.99$). There was statistically significant reduction in drug usage from pre- to post- admission to YFPS for the youth in custody than the youth in community, $t(66) = -2.284$, $p = .026$.

3.1.5 Alcohol and Drug Use

Alcohol use frequency pre-admission to YFPS was highly correlated with drug use frequency pre-admission ($r = .571$, $p = .000$), indicating that 32.6% of the variability in post-admission drug use frequency can be accounted for by pre-admission alcohol use frequency. On the other hand, the correlation between alcohol use frequency pre-admission and drug use frequency post-admission was not statistically significant ($r = .168$, $p = .171$). This indicated that frequency of alcohol use post-admission to YFPS was unrelated to pre-admission frequency of drug usage. However, the amount of alcohol consumed in pre-admission to YFPS was highly correlated to post-admission frequency of drug use, $r = .496$, $p = .001$.

3.1.6 Alcohol and Gender

Five chi-square analyses were conducted to determine whether there were any differences in the extent and pattern of alcohol and drug use between males and females. A chi-square test of the relationship between history of alcohol usage and gender produced $\chi^2(1) = 1.41$, $p = .235$, indicating no statistically significant association between history of alcohol usage and gender. A second chi-square test of the relationship between history of drug usage and gender produced $\chi^2(1) = .061$, $p = .805$, indicating no statistically significant association between history of drug usage and gender. A third chi-square test of the relationship between alcohol use frequency pre-admission to YFPS and gender produced $\chi^2(6) = 3.633$, $p = .726$, indicating no statistically significant association between pre-admission alcohol use frequency and gender. A fourth chi-square test of the relationship between alcohol amount consumed pre-admission to YFPS and gender produced $\chi^2(3) = .544$, $p = .909$, indicating no statistically significant association between pre-admission amount of alcohol consumption and gender. A fifth chi-square test of the relationship between drug use frequency pre-admission to YFPS and gender produced $\chi^2(6) = 6.563$, $p = .363$, indicating no statistically significant association between pre-admission drug use frequency and gender. These results indicated that there was no difference between males and females in their alcohol and drug consumption.

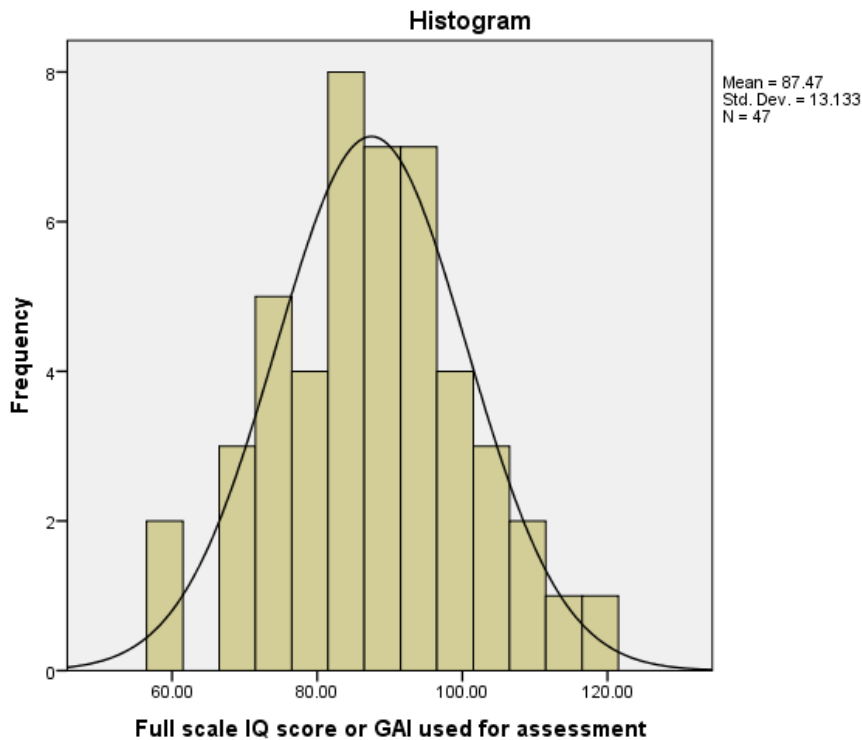
3.1.7 Alcohol and age

Pearson product-moment correlation coefficients were conducted to examine the relationship between age and alcohol and drug consumption. The correlation between age and alcohol use history was $r = .303$, $p = .012$. The correlation between age and drug use history was $r = .460$, $p = .001$. The correlation between age and alcohol use frequency pre-admission to YFPS was $r = .477$, $p = .001$. The correlation between age and alcohol consumption amount pre-admission to YFPS was $r = .388$, $p = .001$. The correlation between age and drug use frequency pre-admission to YFPS was $r = .397$, $p = .001$. These results demonstrated that age was positively correlated with alcohol and drug consumption. Older participants were more likely to have consumed alcohol and drugs in their lives than the younger participants; the older participants were more likely to consume alcohol and drugs more frequently than the younger participants; and the older participants were more likely to consume larger quantities of alcohol than the younger participants.

3.1.8 IQ

Seven participants in this study were not administered any type of the cognitive assessment test (i.e., WAIS-IV or WISC-IV) at YFPS before the data collection date. Fourteen participants' data were not available. Forty seven out of 68 participants (69.1%) were administered either the Wechsler Intelligence Scale for Children fourth edition (WISC-IV) or the Wechsler Adult Intelligence Scale fourth edition (WAIS-IV). Twenty one participants were administered the WAIS-IV, and 26 participants were administered the WISC-IV. For some participants, the general ability index (GAI) was used instead of the full scale IQ (FSIQ). The mean FSIQ score of the 47 participants was 87.47 (SD = 13.13). Scores ranged from 59 to 117 (see *Figure 1*). The mean FSIQ for the general population is 100 (SD = 15). Therefore, the participants in this study scored approximately one standard deviation below the general population.

Figure 1.



3.1.9 Academic achievement

Only 44 out of 68 participants (64.7%) were administered the Woodcock-Johnson achievement test (WJ-III Ach). Two were administered the Wechsler Fundamentals: Academic Skills, while the remainder were not administered any type of the academic achievement test. Therefore, the analysis was based on the WJ-III Ach test percentile of broad reading, broad math, and broad written language scores. The mean broad reading percentile of 44 participants was 41.34 (SD = 28.04). The percentiles ranged from the 2nd percentile to the 99.80th percentile. The mean broad math percentile of 44 participants was 24.43 (SD = 21.80). The percentiles ranged from the 1st percentile to the 94th percentile. The mean broad written language percentile of 44 participants was 35.40 (SD = 24.82). The percentiles ranged from the 0.40th percentile to 93rd percentile. The results indicated that the participants in this study scored below the general population.

3.1.10 IQ/Academic achievement and alcohol and drug usage

Pearson product-moment correlation coefficients were conducted to examine relationship between the Intelligent Quotient (IQ) and alcohol and drug consumption. As hypothesized, IQ

was not statistically significantly correlated with self-reported alcohol and drug usage at pre or post YFPS admission (see Table 2).

Table 2.

Correlations between IQ and pre and post-admission alcohol and drug use frequency and consumption amount

	AlcFre Pre	AlcAmo Pre	Drug Fre Pre	AlcFre Post	AlcAmo Post	Drug Fre Post
IQ	.097	-.151	.012	.168	-.066	-.077

Note: IQ= Intelligent quotient; AlcFre Pre= Alcohol use frequency pre-admission; AlcAmo Pre= Alcohol consumption amount pre-admission; Drug Fre Pre= Drug use frequency pre-admission; AlcFre Post= Alcohol use frequency post-admission; AlcAmo Post= Alcohol consumption amount post-admission; and Drug Fre Post= Drug use frequency post-admission.

Pearson product-moment correlation coefficients were also conducted to examine the relationship between academic achievement and alcohol and drug consumption. Except for the reading score, $r = .314, p < .05$, none of the other academic achievement measures was statistically significantly correlated with self-reported alcohol and drug usage at pre or post YFPS admission (see Table 3).

Table 3.

Correlations between Woodcock Johnson III academic achievement scores and alcohol and drug use frequency and consumption amount at pre and post-admission

	AlcFre Pre	AlcAmo Pre	Drug Fre Pre	AlcFre Post	AlcAmo Post	Drug Fre Post
Reading	.110	.061	.003	.314*	.175	.030
Math	-.087	-.130	-.077	.133	-.039	-.074
Writing	.151	-.050	.064	.154	-.084	-.127

Note: AlcFre Pre= Alcohol use frequency pre-admission; AlcAmo Pre= Alcohol consumption amount pre-admission; Drug Fre Pre= Drug use frequency pre-admission; AlcFre Post= Alcohol use frequency post-admission; AlcAmo Post= Alcohol consumption amount post-admission; and Drug Fre Post= Drug use frequency post-admission.

* $p < .05$.

Pearson product-moment correlation coefficients were conducted to examine the relationship between IQ and academic achievement scores with the APS-SF, POSIT, and the SASSI-A2 substance subscales. As shown in the Table 4, IQ and academic achievement were not statistically significantly related to any of substance use subscales, indicating that there was no relationship between IQ or academic achievement with alcohol and drug consumption.

Table 4.

Correlations between IQ and Woodcock Johnson III academic achievement scores and substance use psychometric measures

	APS:SUB	POSIT A	SASSI-A2 FVA	SASSI-A2 FVOD
IQ	.207	.036	-.075	.001
Reading	.285	.028	.106	.076
Math	.032	-.092	-.071	-.062
Writing	.229	.114	.085	.162

Note: IQ= Intelligent Quotient; APS: SUB= APS-SF substance use; POSIT A= POSIT substance abuse; SASSI-A2 FVA= SASSI-A2 face valid alcohol; and SASSI-A2 FVOD= SASSI-A2 face valid other drug.

3.1.11 Living situation

Most participants lived away from their biological parents at least for some time in their lives (n = 51 or 76%). This included living with foster parents, relatives, adoptive parents, and friends. For those participants who had lived away from home, the number of home placements varied from 1 to 20 homes. The mean numbers of home placements was 4.68 (SD = 4.33) with approximately half of the participants (53.2%) having been placed in one to three homes. The total length of time living out of their biological parents' homes ranged from one month to 186 months. Two participants were adopted when they were young. After removing the adopted participants and those who have never lived away from biological parents, the total length of living out of biological parents' home for the 49 participants ranged from one month to 144 months, with a mean of 34.85 months (SD = 39.51).

3.1.12 Abuse history

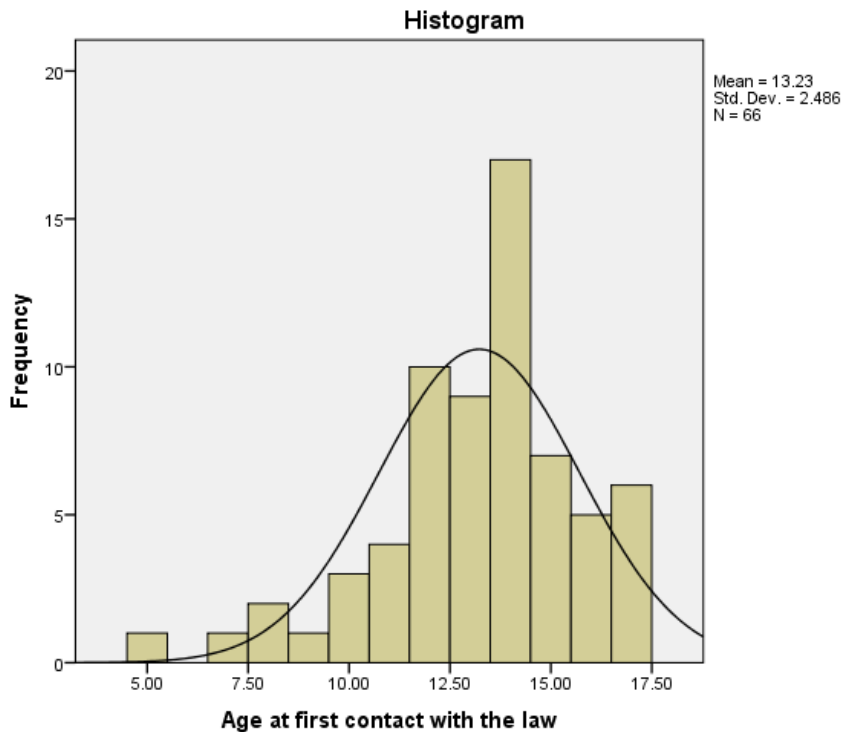
Participants were asked if they had any history of physical, sexual, and psychological abuse. About 27% of the participants (n = 18) did not respond to this question. Of the remainder, 41.2% (n = 28) indicated that they had no history of abuse. Twenty-two participants (32.4%) disclosed that they had experienced physical, psychological, sexual, or some combination of these types of abuse.

3.1.13 Offense history

Concerning their offense history, participants were asked about their age at first contact with the law, the number of arrests, the age at first criminal offence conviction, the type of first offence conviction, the type of index offence for referral to YFPS, the number of incarcerations,

and any substance use during the index offence. Contact with the law was counted only if the law enforcement incident was caused directly or indirectly by the participant, but not if the incident was caused by a family member (e.g., police were called due to neglect, abuse, offense by parents). The mean age at first contact with the law was 13.23 years old (SD = 2.49). The youngest age at first contact with the police was five and the oldest was 17 years old. Approximately 60% of the participants (n = 45) had their first contact with the law between the age of 12 and 15 years (see *Figure 2*).

Figure 2.

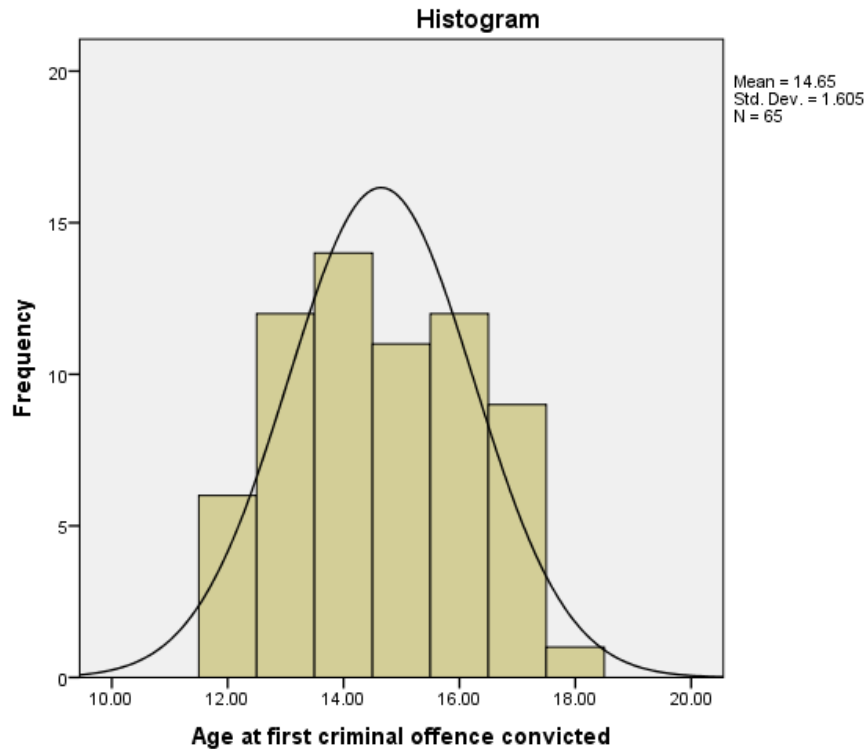


Next, participants were asked how many times they had been arrested. Approximately 44% of the participants (n = 30) indicated that they were arrested four times or more. Approximately 30% of the participants (n = 21) responded that they have no prior arrest before the index offence. Eight participants responded (11.8%) they were arrested once before the index offence, and four participants (5.9%) were arrested two or three times before the index offence.

However, in Canada, under the YCJA, a youth under the age of 12 cannot be charged with a criminal offence. As previously shown, some participants had their first contact with the law as young as five years of age. The age at first criminal offence conviction among the

participants ranged from 12 to 18 years old with the mean age of 14.65 years (SD = 1.60; see *Figure 3*).

Figure 3.



Next, the participants were asked what the first offence type was for which they were convicted. Six (8.8%) indicated they did not remember since they had multiple convictions or they preferred not to answer. Twelve (17.6%) responded that they had no prior conviction, extra judicial sanction (EJS), or deferred custody. Approximately 30% of the participants ($n = 20$) were convicted of violent offences only, 25% ($n = 17$) were convicted of property offences only, 5.9% ($n = 4$) were convicted of sexual offences only, and one (1.5%) was convicted of a substance offence only. Three participants (4.4%) were convicted of both violent and substance offences. Offence types were missing on the remaining 5 (7%) participants.

Only about one third of participants ($n = 23$) disclosed their index offence during the interview. Ten participants (14.7%) were convicted of violent offences, seven (10.3%) were convicted of sexual offences, five (7.4%) were convicted of property offences, and one (1.5%) was convicted of other type of offences.

Most participants (n = 42 or 61.8%) had never been incarcerated. Eighteen participants (26.5%) were incarcerated two or more times, and eight participants were incarcerated once.

Participants were also asked if they had used any substance when they committed the index offence. Forty participants (58.8%) responded that they did not use either drugs or alcohol while committing the index offence. Twenty (29.4%) responded that they used only drugs while committing the index offence. Four (5.9%) responded that they used only alcohol, and three of them (4.4%) responded that they used both drugs and alcohol.

3.1.14 Substance Treatment

Participants were asked if they had received or attended substance use treatment such as individual counseling (alcohol and drug counselor), treatment groups such as Alcoholics Anonymous, Narcotics Anonymous, or a long term residential treatment group. Fifty one participants (75%) indicated that they never attended any form of alcohol or drug treatment. Out of 17 participants who responded that they had attended treatment, 12 of them completed treatment. Four participants dropped out of their treatment program, and one participant's treatment was on-going at the time of the interview. Among those who received some substance use treatment, 13 participants (76.5%) were in the community whereas four participants (23.5%) were in custody at the time of data collection. A Pearson chi-square was conducted to determine whether treatment for substance use was associated with youths being in custody or the community at the time of data collection. A chi-square test of the relationship between treatment status and data collection settings produced $\chi^2(1) = .54, p = .477$. There was no statistically significant association between treatment status and participant setting (see Table 5). Whether the participants received treatment or not was independent of the participants' settings.²

² Note: Fisher's Exact Test p-value concurred with the Pearson's chi-square result, $p = .477$.

Table 5.
Cross-tabulation between treatment status and data collection settings

Treatment Status Settings	No Treatment n (%)	Received Treatment n (%)	Total
Community	43 (76.8%)	13 (23.2%)	56 (82.4%)
Custody Centre	8 (66.7%)	4 (33.3%)	12 (17.6%)
Total	51 (75.0%)	17 (25.0%)	68 (100%)

Note: N = 68; Row percentages are presented in cells
Likelihood Ratio = .514, $p = .474$, Phi = .089, $p = .463$, Cramer's V = .089, $p = .463$,
Contingency coefficient = .089, $p = .463$, Pearson's $r = .089$, $p = .470$

3.1.15 Psychometric Measures

The APS-SF, the POSIT, and the SASSI-A2 were administered to all 68 participants. Fifty-two participants (76.5%) were administered the APS-SF by the researcher in research context whereas sixteen participants (23.5%) were administered the APS-SF by clinicians during their assessment. An independent t-test was conducted to examine if there was significant difference in the APS-SF SUB scores between those administered by YFPS clinicians and those administered by the researcher. The participants who were administered the APS-SF SUB by the researcher scored slightly more highly ($M = 65.02$; $SD = 19.70$) than those who were administered the APS-SF SUB by clinicians ($M = 60.50$; $SD = 15.19$). However, there was not statistically significant difference in T-scores between two groups, $t(66) = .842$, $p = .403$. The average t-score on the APS-SF SUB of the 68 participants was 64 ($SD = 18.73$). The APS-SF SUB T-scores were then converted into four clinical symptom categories: 0 to 64 indicated a subclinical symptom, 65 to 69 indicated a mild clinical symptom, 70 to 79 indicated a moderate clinical symptom, and 80 and over indicated a severe clinical symptom. Most participants scored subclinical ($n = 47$ or 69%). Two scored mild clinical, seven (10%) scored moderate clinical, and 12 scored severe clinical (18%).

The average score of the participants on the POSIT A was 6.14 ($SD = 5.11$). The POSIT A raw scores were converted into three risk levels. A raw score of zero was considered low risk,

raw scores between 1 and 6 were considered medium risk, and raw scores between 7 and 17 were considered high risk. The POSIT had 29 participants (43%) as high risk. Twenty-seven (40%) scored medium risk, and 12 (18%) scored low risk.

According to results from the SASSI-A2, the majority of the participants (n = 56 or 82.4%) scored as having a high probability of either a substance abuse or a substance dependence disorder (scored either 2 or 3 on the SASSI-A2). Four (6%) scored as having a low probability of either a substance abuse or a substance dependence but further assessment was recommended, and 8 (12%) scored as having a low probability of either a substance abuse or a substance dependence disorder.

3.2 Validity of POSIT and SASSI-A2

This section presents convergent and criterion-related validity analyses on the SASSI-A2 FVA and FVOD, the POSIT A and the APS-SF SUB scales and their various subscales. Multiple regression analyses were conducted to determine if combinations of scales facilitated the assessment of usage.

3.2.1 Correlation Matrices

Pearson product-moment correlations were conducted to examine the relationship of three substance use psychometric measures: SASSI-A2 subscale FVA and FVOD T scores, POSIT subscale A (Substance Use/Abuse risk scale) raw score, and APS-SF subscale SUB T score. As hypothesized, all substance use subscales were significantly and strongly correlated (see Table 6).

Table 6.

Correlations between psychometric measures of substance use

	POSIT A	SASSI-A2 FVA	SASSI-A2 FVOD	APS-SF SUB
POSIT A		.580***	.652***	.502***
SASSI-A2 FVA			.706***	.549***
SASSI-A2 FVOD				.531***

Note: POSIT A= POSIT Substance abuse; SASSI-A2 FVA= SASSI-A2 Face Valid Alcohol; SASSI-A2 FVOD= SASSI-A2 Face Valid Other Drug; and APS-SF SUB= APS-SF Substance use.

*** $p < .001$

Convergent (concurrent) validity of POSIT A and SASSI-A2 FVA and FVOD was demonstrated.

The correlation between POSIT A and SASSI-A2 FVA was $r = .580$, $p = .001$ and between

POSIT A and SASSI-A2 FVOD was $r = .652, p = .001$. The convergent validity of the POSIT A and SASSI-A2 scores were demonstrated by such strong relationships.

Next, the criterion-related validity of the POSIT A and SASSI-A2 FVA and FVOD were demonstrated against the APS-SF SUB as the criterion. Correlation between the POSIT A and the APS-SF SUB was $r = .502, p = .001$, the SASSI-A2 FVA and the APS-SF SUB was $r = .549, p = .001$, and the SASSI-A2 FVOD and the APS-SF SUB was $r = .531, p = .001$. These strong relationships demonstrated the criterion-related validity of the POSIT A, the SASSI-A2 FVA and FVOD.

Pearson product-moment correlations were conducted to examine if the POSIT A and the APS-SF SUB were more highly correlated with each other than the SASSI-A2 FVA and FVOD were correlated with either of them. The SASSI-A2 measures alcohol and drugs separately whereas the POSIT and the APS-SF combine alcohol and drugs into one scale. Although it was hypothesized that the POSIT A and the APS-SF SUB would be more highly correlated, this hypothesis was rejected. Table 5 showed that the correlation between the SASSI-A2 FVA and FVOD were more highly correlated with POSIT A, $r = .580, p = .001$, and $r = .652, p = .001$, respectively, than between the POSIT A and the APS-SF SUB, $r = .502, p = .001$. Also, the correlation between the SASSI-A2 FVA and the APS-SF SUB was $r = .549, p = .001$, and the SASSI-A2 FVOD and the APS-SF SUB was $r = .531, p = .001$. Contrary to the hypothesis, these results showed the correlation between the POSIT A and the APS-SF SUB was the least strong correlation among the substance use subscales in this study.

A test of non-independent correlations was conducted to examine whether the correlation between the SASSI-A2 FVA and POSIT A was significantly higher than the correlation between the APS-SF SUB and POSIT A, $t_{obt}(65) = 0.83, p = .408$. This result indicated that the correlations between the SASSI-A2 FVA and POSIT A and the POSIT A and the APS-SF SUB were not significantly different. A test of non-independent correlations was conducted to examine whether the correlation between the SASSI-A2 FVOD and POSIT A was significantly higher than the correlation between the APS-SF SUB and POSIT A, $t_{obt}(65) = 1.64, p = .101$ (Hoerger, 2013; Steiger, 1980). This result indicated that the correlation between the SASSI-A2 FVOD and POSIT A and the POSIT A and the APS-SF SUB was not significantly different.

Pearson product-moment correlations were conducted to examine the relationship between nine risk factors on the POSIT, the four substance use subscales in the POSIT A, the

APS-SF SUB, the SASSI-A2 FVA and FVOD, and the SASSI-A2 summary score. As hypothesized, several risk factors on the POSIT were correlated with the substance use subscales (see Table 6).

Table 6.

Correlations between nine risk factors in the POSIT A and substance use subscales

	POSIT A	APS-SF SUB	SASSI FVA	SASSI FVOD	SASSI Summary
B (physical health)	.594***	.323**	.305*	.428***	.451***
C (mental health)	.423***	.239*	.385***	.421***	.373**
D (family)	.296*	.232	.142	.313**	.434***
E (peer)	.570***	.365**	.389***	.520***	.591***
F (education)	.396***	.115	.256*	.284*	.295*
G (vocation)	.423***	.336**	.392***	.364**	.334**
H (social skills)	.463***	.185	.323**	.347**	.461***
I (leisure/recreation)	.232	.333**	.234	.258*	.350**
J (aggressive behaviour)	.634***	.381***	.459***	.473***	.524***

Note: POSIT A= POSIT Substance abuse; APS-SF SUB= APS-SF Substance use; SASSI FVA= SASSI-A2 Face Valid Alcohol; SASSI FVOD= SASSI-A2 Face Valid Other Drugs; and SASSI Summary= SASSI-A2 Summary decision.

*** $p < .001$; ** $p < .01$; * $p < .05$

As shown in Table 6, physical and mental health and aggressive behaviour scores were moderately to strongly correlated with the POSIT A, the SASSI-A FVA and FVOD, the APS-SF SUB, and the SASSI-A2 summary scale scores. Contrary to the hypothesis, the family scale was only weak to moderately correlated with the POSIT A and the SASSI-A2 FVOD and was not statistically significantly related with the APS-SF SUB or the SASSI-FVA scores. Peer relationship, on the other hand, was statistically significantly and moderate to strongly correlated with all the substance use subscales. Education and social skills were only weakly to moderately correlated with the POSIT A, SASSI-A2 FVA and FVOD. The vocational status score was moderately correlated with all the substance use subscales. Leisure/recreation score was not statistically significantly correlated with the POSIT A and the SASSI-A2 FVA and showed only weak to moderate correlations with the APS-SF SUB and the SASSI-A2 FVOD. These results showed that the SASSI-A2 FVOD and the POSIT A were consistently more highly correlated with the nine risk factors than the APS-SF SUB or the SASSI-A2 FVA. In sum, physical and

mental health, peer relationship, vocational status, and aggressive behaviours were positively correlated with the substance use subscales.

Pearson product-moment correlations were computed to examine the relationship between 11 clinical disorders on the APS-SF and the four substance use subscales: the POSIT A, the APS-SF SUB, and the SASSI-A2 FVA and FVOD score (see Table 7).

Table 7.

Correlations between APS-SF clinical disorders and measures of substance use

Clinical Disorders	APS-SF SUB	POSIT A	SASSI-A2 FVA	SASSI-A2 FVOD
CND (conduct)	.663***	.404***	.387***	.449***
OPD (oppositional)	.342**	.290*	.220	.228
AVP (anger)	.408***	.392***	.293*	.322**
ADP (academic)	.246*	.282*	.250*	.310*
GAD (anxiety)	.236	.445***	.413***	.377**
PTS (trauma)	.168	.381***	.305*	.355**
DEP (depression)	.010	.177	.167	.246*
EAT (eating)	.101	.168	.088	.120
SUI (suicide)	.071	.030	.063	.152
SCP (self concept)	.004	.186	.133	.236
IPP (interpersonal)	.154	.220	.164	.270*

Note: CND= Conduct Disorder; OPD= Oppositional Defiant Disorder; AVP= Anger/Violence Proneness; ADP= Academic Problems; GAD= General Anxiety Disorder; PTS= Posttraumatic Stress Disorder; DEP= Major Depression; EAT= Eating Disturbance; SUI= Suicide; SCP= Self-Concept; IPP= Interpersonal Problems; APS-SF SUB= APS-SF Substance use; POSIT A= POSIT Substance Abuse; SASSI-A2 FVA= SASSI-A2 Face Valid Alcohol; and SASSI-A2 FVOD= SASSI-A2 Face Valid Other Drugs.

*** $p < .001$; ** $p < .01$; * $p < .05$

Conduct disorder on the APS-SF was statistically significantly related to all of the substance use subscales in the study. It was moderately to highly correlated with the APS-SF SUB, $r = .663$, $p = .001$, with the POSIT A, $r = .404$, $p = .001$, with the SASSI-A2 FVA, $r = .387$, $p = .001$, and with the SASSI-A2 FVOD, $r = .449$, $p = .001$. Anger violence proneness was weakly to moderately correlated with all the substance use subscales in the study as well. The correlation between anger proneness and the APS-SF SUB was $r = .408$, $p = .001$, between anger

proneness and the POSIT A was $r = .392, p = .001$, between anger proneness and the SASSI-A2 FVA was $r = .293, p = .016$, and between anger proneness and the SASSI-A2 FVOD was $r = .322, p = .008$. Oppositional defiant disorder was weakly to moderately correlated with the APS-SF SUB and the POSIT A only, $r = .342, p = .004$ and $r = .290, p = .016$, respectively. Generalized anxiety disorder and posttraumatic and stress disorder were moderately correlated with the POSIT A and the SASSI-A2 FVA and FVOD, but were not statistically significantly correlated with the APS-SF SUB. Other clinical disorders did not show strong correlation with the substance use scales. These results demonstrated that youth having behavioural problems, such as anger violence proneness, and mental health issues, such as anxiety and PTSD, were more likely to have substance use problems.

Pearson product-moment correlations were conducted to examine the relationship between self-reported alcohol and drug use frequency prior to the YFPS admission and the substance use subscales: the POSIT A, the SASSI-A2 FVA and FVOD, and the APS-SF SUB. As hypothesized, correlations showed a strong relationship between alcohol and drug use frequency and the substance use subscales (see Table 8).

Table 8.

Correlations between pre and post YFPS admission alcohol and drug use frequency and substance use measures

	APS:SUB	POSIT:A	SASSI:FVA	SASSI:FVOD
AlcPreFreq	.433***	.567***	.657***	.423***
DrugPreFreq	.464***	.530***	.461***	.634***

Note: AlcPreFreq= Alcohol use frequency pre YFPS admission; DrugPreFreq= Drug use frequency pre YFPS admission; APS: SUB= APS-SF Substance use; POSIT:A= POSIT Substance Abuse; SASSI:FVA= SASSI-A2 Face Valid Alcohol; and SASSI:FVOD= SASSI-A2 Face Valid Other Drug.

*** $p < .001$

Among the substance use subscales, the SASSI-A2 FVA showed the highest correlation with self-reported alcohol use pre-admission, $r = .657, p = .001$. The correlation between the SASSI-A2 FVOD and self-reported drug use frequency pre-admission was $r = .634, p = .001$. This was the highest correlation among the substance use scales. The results showed that self-reported drug and alcohol usage prior to the YFPS admission and scores on the substance use scales were highly related. Moreover, the substance use subscale that targeted one substance (alcohol or drugs) rather than combined (alcohol and drugs) showed higher correlations with the

alcohol and drug usage pre-admission.

3.2.2 Multiple Regression Analyses

A multiple regression was conducted to examine whether the three substance use measures, the POSIT A, the APS-SF SUB, and the SASSI-A2 FVA, identified pre-admission alcohol usage. Using the enter method, it was found that the POSIT A, the APS-SF SUB, and the SASSI-A2 FVA explained a significant amount of the variance in pre-admission alcohol usage ($F(3, 64) = 20.059, p = .001$). The result indicated that 48.5% of the variance in this analysis was explained by these three substance use subscales. The analysis showed that the APS-SF SUB was not significantly related to self-reported pre-admission alcohol usage ($t(67) = .431, p = .668$). However, the SASSI-A2 FVA and the POSIT A were significantly related to self-reported pre-admission alcohol usage ($t(67) = 4.018, p = .001$) and ($t(67) = 2.328, p = .023$), respectively (see Table 9).

Table 9.

Multiple regression analysis using the POSIT A, APS-SF SUB, and SASSI-A2 FVA scores to identify pre-admission alcohol usage

	B(SE)	β	<i>t</i> -test	<i>df</i>	<i>p</i>
SASSI-A2 FVA	.057(.014)	.476	4.018***	67	.001
APS-SF SUB	.004(.010)	.048	.431	67	.668
POSIT A (substance abuse)	.091(.039)	.266	2.328*	67	.023

Note: N= 68.

B= Unstandardized beta coefficients; SE= Standard error; β = Standardized beta coefficients; *df*= degree of freedom; *p*= significant level; SASSI-A2 FVA= SASSI-A2 Face Valid Alcohol T score; and APS-SF SUB= APS-SF Substance Abuse disorder T score.

$R = .696, R^2 = .485, R^2_{adj} = .460$, Standard Error of the Estimate= 1.28726

*** $p < .001$; * $p < .05$

A multiple regression was conducted to examine whether the three substance use measures, the POSIT A, the APS-SF SUB, and the SASSI-A2 FVOD, were related to pre-admission drug usage. Using the enter method, it was found that the POSIT A, the APS-SF SUB, and the SASSI-A2 FVOD explained a significant amount of the variance in pre-admission drug usage ($F(3, 64) = 16.707, p = .001$). The results indicated that 43.9% of the variance in this analysis was explained by these three substance use subscales. The analysis showed that the APS-SF SUB was not significantly related to self-reported pre-admission drug usage ($t(67) = 1.248, p = .216$). Also, the POSIT A was not significantly related to self-reported pre-admission

drug usage ($t(67) = 1.296, p = .200$). However, the SASSI-A2 FVOD was significantly related to self-reported pre-admission drug usage ($t(67) = 3.471, p = .001$) (see Table 10).

Table 10.

Multiple regression analysis using the POSIT A, APS-SF SUB, and SASSI-A2 FVOD scores to identify pre-admission drug usage

	B(SE)	β	<i>t</i> -test	<i>df</i>	<i>p</i>
SASSI-A2 FVOD	.064(.018)	.451	3.471***	67	.001
APS-SF SUB	.017(.014)	.142	1.248	67	.216
POSIT A (substance abuse)	.073(.056)	.165	1.296	67	.200

Note: N = 68.

B = Unstandardized beta coefficients; SE = Standard error; β = Standardized beta coefficients; *d* = degree of freedom; *p* = significant level; SASSI-A2 FVOD = SASSI-A2 Face Valid Other Drug T score; and APS-SF SUB = APS-SF Substance Abuse disorder T score.

$R = .663$ $R^2 = .439$, $R^2_{adj} = .413$, Standard Error of the Estimate = 1.72381

*** $p < .001$

The above results showed that the SASSI-A2 FVA and FVOD, which target specific substances (either alcohol or drugs), were related to pre-admission alcohol or drug usage better than the substance use subscales that measure combined substances (the POSIT A and the APS-SF SUB).

A multiple regression was conducted to examine if risk subscales (i.e., Physical Health, Mental Health, Peer Relations, Family Relations, Leisure and Recreation, and Social Skills) on the POSIT and Family-Friends subscale on the SASSI-A2 predicted change in alcohol usage from pre to post-admission to YFPS. Using the enter method, it was found that Physical Health, Mental Health, Peer Relations, Family Relations, Leisure and Recreation, Social Skills and Family-Friends subscale scores explain a statistically significant amount of the variance in change in alcohol usage from pre to post-admission ($F(7, 60) = 2.257, p = .042$). The results indicated that 20.8% of the variance in this analysis was explained by those subscales. The analysis showed that peer relations significantly predicted change in alcohol usage from pre to post-admission ($\beta = .321, t(67) = 2.017, p = .048$). All other subscales did not significantly predict change in alcohol usage from pre to post-admission (see Table 11).

Table 11.

Multiple regression analysis using POSIT subscales and SASSI-A2 Family-Friends subscale to predict change in alcohol usage from pre to post-admission

	B(SE)	β	<i>t</i> -test	<i>df</i>	<i>p</i>
POSIT B (physical health)	-.204(.130)	-.254	-1.561	67	.124
POSIT C (mental health)	.050(.066)	.124	.747	67	.458
POSIT E (peer relations)	.239(.118)	.321	2.017*	67	.048
POSIT D (family relations)	-.060(.090)	-.095	-.668	67	.506
POSIT H (social skills)	.281(.154)	.275	1.824	67	.073
POSIT I (leisure/recreation)	.055(.127)	.057	.437	67	.664
SASSI-A2 family-friends	-.004(.025)	-.023	-.147	67	.884

Note: N = 68.

B = Unstandardized beta coefficients; SE = Standard error; β = Standardized beta coefficients; *df* = degree of freedom; and *p* = significant level.

$R = .457$, $R^2 = .208$, $R^2_{adj} = .116$, Standard Error of the Estimate = 1.64166

* $p < .05$

A multiple regression was conducted to examine whether the risk subscales on the POSIT (i.e., Physical Health, Mental Health, Peer Relations, Family Relations, Leisure and Recreation, and Social Skills) and Family-Friends subscale on the SASSI-A2 predicted change in drug use from pre- to post-admission to YFPS. Using the enter method, it was found that Physical Health, Mental Health, Peer Relations, Family Relations, Leisure and Recreation, and Social Skills and Family-Friends subscale scores did not explain a statistically significant amount of the variance in change in drug usage pre- and post-admission ($F(7, 60) = .632$, $p = .728$). The results indicated that change in drug usage from pre to post-admission was not explained by any of the subscales in this analysis (see Table 12).

Table 12.

Multiple regression analysis using POSIT subscales and SASSI-A2 Family-Friends subscale to predict change in drug usage from pre to post-admission

	B(SE)	β	<i>t</i>	<i>df</i>	<i>p</i>
POSIT B (physical health)	-.274(.177)	-.274	-1.554	67	.125
POSIT C (mental health)	.087(.090)	.175	.970	67	.336
POSIT E (peer relations)	.166(.160)	.178	1.035	67	.305
POSIT D (family relations)	.039(.122)	.049	.318	67	.751
POSIT H (social skills)	.050(.208)	.039	.241	67	.810
POSIT I (leisure/recreation)	.053(.172)	.044	.310	67	.758
SASSI-A2 family-friends	-.017(.034)	-.085	-.493	67	.624

Note: N = 68.

B = Unstandardized beta coefficients; SE = Standard error; β = Standardized beta coefficients; *df* = degree of freedom; and *p* = significant level.

$R = .262$, $R^2 = .069$, $R^2_{adj} = -.040$, Standard Error of the Estimate = 2.22254

The preceding findings generated further research questions. First, which measures (SASSI-A2 FVA and FVOD or POSIT A) most closely reflect the results of the APS-SF SUB? Second, can the pre-admission alcohol and drug use measures and participation in treatment predict change in alcohol and drug use from pre- to post-admission?

Pearson chi-squares were conducted to determine whether the SASSI-A2, the APS-SF SUB, or the POSIT A produced categories closer to those derived from the APS-SF SUB. In order to conduct these analyses, the SASSI-A2 summary score was categorized into four groups: no substance abuse, further assessment required, substance abuse, substance dependence. The APS-SF SUB score was categorized into four groups: subclinical symptom, mild clinical symptom, moderate clinical symptom, and severe clinical symptom. The POSIT A score was categorized into three groups: low risk, medium risk, and high risk. Since the total number of participants was relatively small, the expected frequency of each cell might be considerably too small for use with Pearson's chi-square. For that reason, Fisher's Exact Test was also used.

A chi-square test of the relationship between SASSI-A2 summary score and the APS SUB score produced $\chi^2(9) = 9.300$, $p = .410$. There was no statistically significant association

between the SASSI-A2 summary score and the APS-SF SUB score (see Table 13). For example, more than half of the offenders who were rated as subclinical on the APS-SF (25/47 = 53%) fell into the high substance dependence group on the SASSI-A2.

Table 13.

Cross-tabulation between the SASSI-2 categories and the APS-SF SUB categories

APS- SF \ SASSI-A2	Subclinical n (%)	Mild clinical n (%)	Moderate clinical n (%)	Severe clinical n (%)	Total n (%)
Low	7 (10.3%)	1 (1.5%)	0 (0%)	0 (0%)	8 (11.8%)
Low but further assessment required	4 (5.9%)	0 (0%)	0 (0%)	0 (0%)	4 (5.9%)
High Substance Abuse	11 (16.2%)	0 (0%)	2 (2.9%)	2 (2.9%)	15 (22.1%)
High Substance Dependence	25 (36.8%)	1 (1.5%)	5 (7.4%)	10 (14.7%)	41 (60/3%)
Total	47 (69.1%)	2 (2.9%)	7 (10.3%)	12 (17.6%)	68 (100%)

Note: N = 68

Low = Low probability of having substance abuse or substance dependence disorder; Low but further assessment required = Low probability, but consider further assessment for substance abuse disorder; High Substance Abuse = High probability of having substance abuse disorder; High Substance Dependence = High probability of having substance dependence disorder; Subclinical = T score 0 to 64; Mild clinical = T score 65 to 69; Moderate clinical = T score 70 to 79; and Severe clinical = T score 80 or over.

Likelihood Ratio = 11.892, $p = .219$, Phi = .370, $p = .410$, Cramer's V = .214, $p = .410$, Contingency coefficient = .347, $p = .410$, Pearson's $r = .276$, $p = .023$

A second chi-square test of the relationship between the SASSI-A2 categories and the POSIT A categories produced $\chi^2(6) = 54.283$, $p = .001$. There was a statistically significant association between the SASSI-A2 and the POSIT A score (see Table 14). In particular, all youth who were rated as being high risk on the POSIT A fell into the high substance dependence group on the SASSI-A2.

Table 14.

Cross-tabulation between the SASSI-A2 categories and the POSIT A categories

POSIT \ SASSI-A2	Low Risk n (%)	Medium Risk n (%)	High Risk n (%)	Total n (%)
Low	4 (5.9%)	4 (5.9%)	0 (0%)	8 (11.8%)
Low but further assessment required	4 (5.9%)	0 (0%)	0 (0%)	4 (5.9%)
High Substance Abuse	3 (4.4%)	12 (17.6%)	0 (0%)	15 (22.1%)
High Substance Dependence	1 (1.5%)	11 (16.2%)	29 (42.6%)	41 (60.3%)
Total	12 (17.6%)	27 (39.7%)	29 (42.6%)	68 (100%)

Note: N = 68

Low = Low probability of having substance abuse or substance dependence disorder; Low but further assessment required = Low probability, but consider further assessment for substance abuse disorder; High Substance Abuse = High probability of having substance abuse disorder; High Substance Dependence = High probability of having substance dependence disorder; Low Risk = 0 on POSIT A; Medium Risk = 1 to 6 on POSIT A; and High Risk = 7 to 17 on POSIT A. Likelihood Ratio = 58.378, $p = .001$, Phi = .893, $p = .001$, Cramer's V = .632, $p = .001$, Contingency coefficient = .666, $p = .001$, Pearson's $r = .683$, $p = .001$

A third chi-square test of relationship between the APS-SF SUB categories and the POSIT A categories produced $\chi^2(6) = 8.860$, $p = .182$. There was no statistically significant association between the APS-SF SUB and the POSIT A scores (see Table 15). For example, only 12 of the 29 (41%) youth who were rated high risk on the POSIT were described as having any symptomatology on the APS-SF.

In sum, the POSIT and SASSI-A2 classification decisions were related to each other in spite of the fact they had a different number of categories and were on different scales (risk and diagnosis). This demonstrated the concurrent validity of the two measures and their use of categories. However, the SASSI-A2 and the POSIT classifications were independent of the APS-SF classification.³

³Note: Fisher's Exact Test p-value concurred with the Pearson's chi-square results: $p = .537$, $p = .000$, and $p = .192$, respectively.

Table 15.

Cross-tabulation between the APS-SF SUB categories and the POSIT A categories

APS-SF \ POSIT	Subclinical n (%)	Mild clinical n (%)	Moderate clinical n (%)	Severe clinical n (%)	Total n (%)
Low Risk	11 (16.2%)	0 (0%)	1 (1.5%)	0 (0%)	12 (17.6%)
Medium Risk	19 (27.9%)	2 (2.9%)	2 (2.9%)	4 (5.9%)	27 (39.7%)
High Risk	17 (25%)	0 (0%)	4 (5.9%)	8 (11.8%)	29 (42.6%)
Total	47 (69.1%)	2 (2.9%)	7 (10.3%)	12 (17.6%)	68 (100%)

Note: N = 68

Subclinical = T score 0 to 64; Mild clinical = T score 65 to 69; Moderate clinical = T score 70 to 79; and Severe clinical = T score 80 or over; Low Risk = 0 on POSIT A; Medium Risk = 1 to 6 on POSIT A; and High Risk = 7 to 17 on POSIT A.

Likelihood Ratio = 11.339, $p = 0.078$, Phi = .361, $p = .182$, Cramer's V = .255, $p = .182$, Contingency coefficient = .340, $p = .182$, Pearson's $r = .283$, $p = .019$

A multiple regression was conducted to examine whether participation in treatment was related to change in alcohol use frequency at post-admission after controlling for pre-admission alcohol usage and other risk factors. Since this analysis was not an a priori hypothesis, the POSIT risk factor that was most highly related to usage, as examined for hypothesis 14 (i.e., peer relations), was also included. Correlational analyses demonstrated that Peer Relations (the POSIT E) and pre-admission alcohol use frequency were significantly related to change in alcohol use from pre to post-admission $r = .353$, $p = .002$, and $r = .788$, $p = .001$, respectively. However, whether substance use treatment was received or not was not significantly related to change in alcohol usage from pre to post-admission. Using the enter method, it was found that the pre-admission alcohol usage, treatment status, and Peer Relations explained a significant amount of the variance in change in alcohol use post-admission ($F(3, 64) = 35.271$, $p = .001$). The results indicated that 62.3% of the variance in change in alcohol use post-admission was explained by these three variables. However, the analysis showed that treatment status ($t(67) = -.559$, $p = .578$) and Peer Relations ($t(67) = .027$, $p = .979$) were not significantly related to change in alcohol usage post-admission. However, pre-admission alcohol use frequency significantly predicted change in alcohol use from pre- to post-admission ($t(67) = 9.196$, p

= .001). These results indicated that only pre-admission alcohol use predicted change in frequency of alcohol use from pre- to post-admission. In other words, youths' participation in treatment was not related to any reduction in alcohol use (see Table 16).

Table 16.

Multiple regression analysis using pre-admission alcohol usage, treatment status, and peer relationship score to predict change in alcohol usage from pre- to post-admission

	B(SE)	β	<i>t</i> -test	<i>df</i>	<i>p</i>
Substance Use Treatment Status	-.183(.326)	-.046	-.559	67	.578
POSIT E (peer relations)	.002(.066)	.002	.027	67	.979
Pre-admission Alcohol Use frequency	.795(.086)	.798	9.196***	67	.001

Note: N = 68.

B = Unstandardized beta coefficients; SE = Standard error; β = Standardized beta coefficients; *df* = degree of freedom; and *p* = significant level.

$R = .789$, $R^2 = .623$, $R^2_{adj} = .605$, Standard Error of the Estimate = 1.09680

*** $p < .001$

Another multiple regression was conducted to examine if pre-admission drug usage and participation in treatment predicted change in drug use frequency post-admission. As per the previous analysis, Peer Relationship was included as a predictor variable. The correlation between pre-admission drug usage and change in drug usage from pre to post-admission was $r = .427$, $p = .001$. Change in drug use from pre to post-admission was not strongly related to Peer Relations and treatment status. Using the enter method, it was found that pre-admission drug use frequency, Peer Relations, and treatment status explained a statistically significant, but small, amount of the variance in change in alcohol use post-admission ($F(3, 64) = 5.145$, $p = .003$). The results indicated that 19.4 % of the variance in change in drug use post-admission was explained by those variables. Further analyses showed that treatment status and Peer Relations did not significantly predict change in drug use from pre to post-admission ($t(67) = .246$, $p = .806$) and ($t(67) = -.974$, $p = .334$). Only pre-admission drug usage predicted change in drug use from pre to post-admission ($t(67) = 3.726$, $p = .001$). Similar to alcohol use, treatment did not predict reduction in drug use among the participants in this study (see Table 17).

Table 17.

Multiple regression analysis using pre-admission drug usage, treatment status, and peer relationship score to predict change in drug usage from pre to post-admission

	B(SE)	β	<i>t</i> -test	<i>df</i>	<i>p</i>
Substance Use Treatment Status	.146(.594)	.029	.246	67	.806
POSIT E (peer relations)	-.122(.126)	-.132	-.974	67	.334
Pre-admission Alcohol Use frequency	.473(.127)	.488	3.726***	67	.001

Note: N = 68.

B = Unstandardized beta coefficients; SE = Standard error; β = Standardized beta coefficients; *df* = degree of freedom; and *p* = significant level.

$R = .441$, $R^2 = .194$, $R^2_{adj} = .157$, Standard Error of the Estimate = 2.00154

*** $p < .001$

4.0 DISCUSSION

This study was conducted to accomplish two related, but different, objectives. It described the demographics characteristics of non-Aboriginal youth who were active clients at YFPS in central and south Vancouver Island, British Columbia between April, 2012 and August, 2013. In particular, it was designed to describe non-Aboriginal YFPS clients' patterns of substance use in detail. Secondly, this study examined and compared the validity of two popular measures, the SASSI-A2 and the POSIT, to identify youth with substance use problems at YFPS.

At a provincial level, YFPS have conducted various studies; however, few studies have been done within Vancouver Island. The demographics of each region in British Columbia vary substantially. Consequently, provincial level studies may not accurately represent specific regions. For this reason, a study like the current one may shed light on regionally specific problems and may lead to the identification of appropriate regional treatment needs. The current study is one of a few studies that had focused on substance use problems of clients of YFPS on Vancouver Island. As such, it made a practical contribution to YFPS which shared its data with the researcher and provided the researcher an opportunity to collect original data.

4.1 Amount of Alcohol and Drug Use Among YFPS Youth

The prevalence of alcohol and drug use among the participants in the current study cannot be ignored. Approximately 90% of the participants reported that they have used alcohol or drugs in their lives. CAS (2007) reported a similar findings for alcohol use among youth. However, Kosterman et al. (2000) found different results for marijuana use among adolescents. They found only 50% of youth had initiated marijuana by the age of 18 years, while this study found over 90% had used marijuana in their lives. Alcohol use and drug use were highly correlated. Moreover, it is of concern that over half of the participants acknowledged that they continued to consume alcohol or drugs after being admitted to YFPS. Since the majority of the youth who come in contact with the law consume alcohol or use illicit drugs, one wonders if both the law enforcement officials and clinicians have become immune to youth alcohol and drug use. It appears that youth substance use may be overlooked when dealing with "more serious issues" such as violence, sexual, and property offence. Yet approximately 30% of the youth in this study scored one standard deviation above the population norm. As for risk and diagnosis of substance use, on a measure of substance use, over 40% scored high (7 to 17) on the POSIT A and over 80% had a high probability of having either substance abuse or substance dependence disorder as

measured by the SASSI-A2. Thus, the current study clearly indicated an elevated prevalence of substance use among the participants.

Approximately 40% of the participants in this study indicated that they were under the influence of substances at the time of committing their offence. This rate may be considered rather high, but is substantially lower than findings by Putnins (2003) who reported that 60% of the young offenders from Australia in his study were under the influence of substances while committing their offenses.

This study demonstrated that youth showed a significant reduction in alcohol and drug use after being admitted to YFPS compared to alcohol and drug usage before the admission to YFPS. When degrees of reduction in alcohol and drug use were examined between the youth in custody and the youth in community, this study found a greater reduction in alcohol and drug usage amongst the youth in custody than the youth in the community. The degree of reduction in alcohol usage between the youth in custody and the youth in community was statistically significant at $p = .075$ and the degree of reduction in drug usage between the youth in custody and the youth in community was statistically significant at $p = .026$. These findings are expected as obtaining alcohol and drugs in custody is much harder than in the community, and it is natural that the youth in custody have much less opportunity to consume alcohol and drugs than those in community, even though those in the community were under probation supervision.

Further testing indicated that youths' participation in treatment did not significantly affect a reduction in alcohol and drug use. The reason for a lack of decrease in relation to treatment may be associated with the various kinds of (unknown) treatments youth received while at YFPS. Moreover, the decrease for youth in the community may have been associated with their probation condition. Youths may try to avoid alcohol and drug use while they are on probation in order to avoid being breached. For youths in custody, alcohol and drugs are not readily available. Therefore, non-treatment-related factors appear to be responsible for the reduction in alcohol and drug use.

Moreover, only 25% of the youth in this study indicated that they had been referred to some form of substance use treatment. Bonta, et al. (2004) found that intervention plans for young offenders were more often developed based on a court order than what the offender assessment indicated. They also found that substance use treatment was recommended in 80% of the cases in their Manitoba probation sample. However, youth in need of treatment tended not

to be referred to treatment or not to receive treatment. Their findings appear to bare some resemblance to the treatment-related findings in the current study.

The researcher found that there was not a significant difference between the substance use treatment group and the non-treatment group in reduction of their alcohol and drug usage from pre- to post-treatment. These results indicate two potential concerns. First, not all youth who were in need of substance use treatment had been referred to substance use treatment. Second, substance use treatment programs that youth had attended may not be as effective as they should be. These findings lead to a few suggestions. First, YFPS should consider offering specialized substance abuse treatment programs as it does for violent and sexual offending youth. As not all youth who are in need of substance use treatment received treatment outside YFPS, offering such a specialized program will give these youth an opportunity to receive treatment. Second, including substance abuse treatment as a recommendation in a report for probation officers may not be sufficient as the action may not be taken. Therefore, if or when offering specialized substance abuse treatment is not possible at YFPS, clinicians should ideally refer their clients to a substance abuse treatment program as soon as substance abuse or dependence problems are identified. Third, it would be useful to identify which treatment programs would demonstrate better treatment outcome before referring youth to programs. Therefore, substance abuse treatment program evaluation is recommended.

4.2 The Use of Psychometric Scales (SASSI-A2 and POSIT) to Identify Youth with Substance Abuse Problems

Although past research has demonstrated that the SASSI-A2 is sensitive, accurate, and less susceptible to falsification in screening for substance use disorder than other screening tools, and is designed to target youth in the criminal justice system, YFPS has not used this tool to identify youth with substance use problems. Although it is required for clinicians at YFPS to conduct thorough assessments, the budget to purchase testing protocols can be limited. Ideally, YFPS would use instruments that are free of charge and available in a public domain, yet identify problems as well as the SASSI-A2. For that reason, this study was conducted to demonstrate the concurrent validity of the SASSI-A2 and the POSIT to determine if the POSIT is a cost effective but reliable alternative to the SASSI-A2. Therefore, a validity study such as this one could be important for the agency which relies daily on psychometric measures.

As hypothesized, the SASSI-A2 FVA and FVOD, the POSIT A, and the APS-SF substance use subscale were all highly correlated. However, when the classification of youth was examined in detail, the results from both the POSIT and the SASSI-A2 depicted a different picture than those from the APS-SF. Only twelve participants scored as having a low risk on the POSIT and a low probability of having a substance abuse or substance dependence disorder on the SASSI-A2, while forty-seven participants scored below subclinical range on the APS-SF. This study demonstrated that both the SASSI-A2 and the POSIT are more inclusive screening tools for substance abuse problems and, conversely, more stringent in identifying those who are at low risk of having substance use disorder and therefore do not require substance abuse treatment programming. This study demonstrated that the correlation between the SASSI-A2 and the APS-SF and the correlation between the POSIT and the APS-SF are as strong as the correlation between the SASSI-A2 and the POSIT. Moreover, the SASSI-A2 and the POSIT are tools that youth can complete quickly, and the POSIT is a multi-screening tool that can assist clinicians in developing treatment plans that are unique to individuals' need. Considering all these variables, one might suggest that the POSIT is the screening tool of choice because it is in the public arena and also allows measuring other adolescent problems.

The POSIT measures various types of behavioural, physical, and mental health problems. Watts and Wright (1990) indicated that young offenders use drugs to show their "tough guy" image to their peers and to fit in with them. This study corresponded Watts and Wright (1990)'s statement. This study found a strong relationship between bad peer relationships and substance use. As hypothesized, all risk factors on the POSIT were significantly correlated with the POSIT A, the SASSI-A2 FVOD, and the SASSI-A2 summary scores. Physical and Mental Health, Peer Relations, Vocation, Leisure/Recreation, and Aggressive Behaviours were correlated with the APS-SF, and Physical and Mental Health, Peer Relations, Education, Vocation, Social Skills, and Aggressive Behaviours were moderately correlated with the SASSI-A2 FVA.

In sum, Physical and Mental Health, Peer Relations, Vocation, and Aggressive Behaviours were significantly correlated with substance abuse and dependence. This finding is important to note as it supports the contention that substance abuse often goes hand in hand with other mental health issues and interpersonal problems. However, Family Relations Aggressive Behaviours Education, Social Skills, and Leisure/Recreation may not be associated with substance use problems. Quite a few participants stated that they consumed alcohol and drugs to

relax, relieve stress, forget about negative things in their lives, peer pressure, and fit-in with their peers. These findings may be important as they do not support the idea that dysfunctional family and negative parent-child relationship are related to youths' substance use problems. Also, although some participants responded that their parents consumed drugs and alcohol and invited youth to use alcohol and drugs, family relationship was not associated with youths' substance use problems. If leisure/recreation habit or social skills were related to substance use problems, one could recommend youth to find positive leisure/recreation habits and social skills. However, they were not associated with substance use problems. It would appear that peer-mediated variables are very important determinants in youth substance use.

The APS-SF measures various types of adolescent psychopathologies. Although hypothesized, not many clinical disorders were correlated with the POSIT A, the SASSI-A2 FVA, FVOD, and the APS-SF SUB. Conduct Disorder and Anger and Violence Proneness were highly significantly correlated with all subscales. This corresponded well with the results from the POSIT J (Aggressive Behaviour). General Anxiety Disorder was also significantly correlated with the POSIT A, the SASSI-A2 FVA and FVOD, but not with the APS-SF SUB. Academic Problems were only moderately correlated with all four substance use subscales. Also, Posttraumatic Stress Disorder was moderately correlated with the POSIT A, the SASSI-A2 FVA and FVOD, but not with the APS-SF SUB. These findings are important as they supported the idea that behavioural problems go hand in hand with substance use problems. Conduct disorder, anger, and violence may be triggered by intoxication as people tend to behave more boldly when they are intoxicated. These findings may be important as they suggest that there may be a relationship between violence and substance use. Therefore, those who receive violence offender treatment may benefit from substance use treatment since violent behaviours may be reduced or eliminated when substance use problems are under control.

Although it was hypothesized that the POSIT A and the APS-SF SUB would be more highly correlated with each other than the SASSI-A2 FVA and FVOD was correlated with either of them, the findings indicated that the POSIT A and the SASSI-A2 FVA and FVOD were more highly correlated with each other than the POSIT A was correlated with the APS-SF SUB or the SASSI-A2 FVA and FVOD was correlated with the APS-SF. One explanation behind these findings is that items on the POSIT and the SASSI-A2 are similar. On the other hand, items on the APS-SF SUB focus on the substances that youth use and their frequency of substance use

only. Although there was a slight difference in the magnitude of these correlations, a test of non-independent correlations showed the difference was not significant. One can conclude that the POSIT and the SASSI-A2 are comparable to the APS-SF at least in their correlation with each other, but not in terms of their a priori cut-offs to identify problems in substance usage.

A multiple regression analysis was conducted to examine if substance use scales could identify pre-admission alcohol and drug usage. As hypothesized, the POSIT, the SASSI-A2 FVA and FVOD, and the APS-SF SUB explained a significant amount of the variance in pre-admission alcohol and drug usage. However, the APS-SF SUB was not significantly related to self-reported pre-admission alcohol and drug usage alone. The SASSI-A2 FVA was significantly related to self-reported pre-admission alcohol usage, and the SASSI-A2 FVOD was significantly related to self-reported pre-admission drug usage. The POSIT A was significantly related to self-reported pre-admission alcohol usage; however, it did not do so for drug usage. These findings indicated that the SASSI-A2 may be the substance use measures of choice if one wants to identify alcohol and drug problems separately, while the POSIT A and the APS-SF SUB may not be appropriate in this circumstance. The APS-SF SUB determines which substances youth have used and their frequency of consumption in the last six months. Questions such as these may not be sufficient enough to predict substance use problems.

Although hypothesized, risk factors such as Physical and Mental Health, Family Relationships, Peer-Relationships, Social Skills, Leisure/Recreation, on the POSIT and Family-Friends on the SASSI-A2 did not predict change in alcohol and drug use from pre to post-admission. Only Peer-Relationships significantly predicted change in alcohol usage from pre to post-admission. This is potentially an important finding as it may instruct clinicians providing treatment, probation officers, and case managers to focus specifically on peer-related issues.

This study demonstrated the SASSI-A2 and the POSIT were as good as the APS-SF at identifying substance use problems. This led to the question as to which measure most closely reflected the results of the APS-SF SUB, which documented pre-assessment usage. However, the SASSI-A2 and the POSIT classifications were independent of the APS-SF classifications. These results were unexpected as previous findings demonstrated that the SASSI-A2, the APS-SF, and the POSIT were highly correlated with each other. As previously mentioned, the APS-SF identifies types of substances youth used and frequency of their consumption whereas the POSIT and the SASSI-A2 identify behaviours and attitudes related to substance problems. What

the APS-SF measures may be different from what the SASSI-A2 and the POSIT measure. Therefore, it appears worthwhile to administer the SASSI-A2 and the POSIT regardless of the administration of the APS-SF to measure substance use problems.

Although the researcher administered APS-SF SUB T-scores ($M = 65.02$) were higher than clinician administered APS-SF SUB T-scores ($M = 60.50$), the result indicated that there was no statistical significant difference between those scores. However, when the classification is observed, T-score below 64 is subclinical, and T-score between 65 to 69 is mild clinical. The researcher cannot ignore the difference between two groups even though they are not statistically significant because there may be practical implications of this difference. What this result indicated was that when youth were administered the APS-SF by clinicians, they may minimize their scores to avoid consequences. The youth were aware that the researcher had no power to influence their probation orders and, therefore, they might have answered more truthfully.

Putnins (2003) and Cottle et al. (2001) found statistically significant but weak relationship between substance use and reoffending. Cottle et al. (2001) argued the discriminative power of substance use was diminished since a large number of young offenders use substances. Even though this study also found that a large number of participants used substances, there was variability in amount and frequency of substance use. Therefore, the discriminative power of substance use remained intact. Overall, this study demonstrated a strong relationship between substance use, substance use measures, and other variables.

Finally, participation in treatment (received/not received) was examined to determine whether it had any impact on change of alcohol and drug use from pre- to post-admission. Only pre-admission alcohol and drug use frequency predicted change in alcohol and drug use from pre- to post-admission. Youth who consumed more alcohol and drugs at pre-admission decreased their usage at post-admission more than youth who had less usage at pre-admission, while participation in treatment was unrelated to change in usage. This was unexpected as one would anticipate that participants who received treatment would show a greater decrease in alcohol and drug consumption than those who did not receive treatment. These findings suggest that the substance use treatment participants received is not as effective as was anticipated. These findings suggest that probation officers should consider the treatment programs to which they send their clients and monitor their substance use closely to assess the effectiveness of these programs.

4.3 Limitations of the Current Study:

There were several limitations to the proposed study. The first limitation was the difficulty in obtaining the DSM-IV diagnosis of substance use related disorder problems. When youth are admitted to YFPS, the team of clinicians conducts an initial assessment, which includes a psychiatric review of the client. However, psychologists and psychiatrists at YFPS often defer diagnosing clients at this stage. Consequently, most participants in the current study did not have a diagnosis on their file until the discharge report was created. Pre-admission assessment and diagnosis are helpful to compare pre and post-admission changes. Therefore, a more immediate diagnosis is recommended. When the researcher collected the data, many participants' files did not include diagnosis and therefore the researcher could not use clinical diagnosis as a criterion variable. To compensate for this problem, the APS-SF: SUB was used as the substance use criterion.

A second limitation for the current study was that the researcher was not able to collect data on specialized substance use treatment. When a youth was referred to substance abuse treatment by probation officers, YFPS might or might not be informed of this decision. Therefore, there was no information on substance use treatment (i.e., types of facilities youth are referred, types of treatment program youth are received, treatment completion status, and treatment effectiveness) in the client database. To overcome this problem, the researcher asked the participants if they were referred to substance use treatment or not and if they responded affirmatively, did they attend it or not, and if so, did they complete it or not. Thus, the information regarding substance use treatment was collected solely based on self-report interview format. Therefore, the researcher might not have obtained accurate information on substance abuse treatment from all participants and was not able to examine reduction in alcohol and drug use by the different kinds of treatment that participants received.

A third limitation concerns the variability in dates among the test measures. This study used data and other information (i.e., APS-SF, WISC-IV/WAIS-IV, and WJ-III scores) that were collected during the youth's intake assessment which was conducted when youth were first admitted to YFPS. Therefore, the time interval between the initial clinical assessment and the administration of the SASSI-A2 and the POSIT varied for each youth. The closer the initial clinical assessment and the SASSI-A2 and the POSIT administration dates were, the more confident one could be about interpreting the correlation between the APS-SF: SUB result and

scores on the SASSI-A2 and the POSIT as a measure of concurrent validity. However, if there was a large temporal gap between initial assessment and the SASSI-A2 and the POSIT administration dates, the correlation between those variables could be affected by events that occurred in the interval. Whatever happened from the date of initial assessment to the SASSI-A2 and the POSIT administration might have affected the conditions of youth at the time of data collection by the researcher. For example, youth might be diagnosed with substance abuse, and he or she might have received substance use treatment during this period. Due to the treatment youth receives, his or her substance use problems might be reduced or treated by the time he or she was seen by the researcher. In this case, scores on the SASSI-A2 and the POSIT could have been affected by treatment. Therefore, simply comparing the APS-SF: SUB score and the SASSI-A2 and the POSIT scores to determine the validity of the SASSI-A2 and the POSIT could have resulted in an underestimate of the validity of those two measures. For example, a youth could have been diagnosed with substance dependence, but he or she scored low on the SASSI-A2 and the POSIT because symptoms for substance dependence might not be present at the time of the SASSI-A2 and the POSIT administration. Under such circumstance, the correlation, or lack thereof, between the SASSI-A2 and the POSIT and the APS-SF: SUB score would be difficult to interpret. A nonsignificant result could occur if the youth's substance use problem had been successfully treated. Alternatively, if the youth's condition did not change at all (treatment was not effective, and substance use problems still exist), then a nonsignificant relationship would reflect the fact that the SASSI-A2 and the POSIT were not valid measures of assessing substance use problems. In other word, the correlational results must be interpreted with caution.

For this reason, the closer the initial assessment and the SASSI-A2 and the POSIT assessment dates were in time, the more confident one would be about the results of the correlation analysis reflecting concurrent validity. Ideally, this time difference would be used as a covariate to remove the effect of time between the initial diagnostic assessment and the SASSI-A2 and the POSIT administration by examining partial correlations. However, the researcher could not control for number of days between testing and diagnosis without having the dates that the diagnoses were made, not all of which were available. Therefore, the reported correlations quite likely underestimate the diagnostic accuracy of the SASSI-A2 and the POSIT.

A fourth limitation was that the current study did not include a long term follow-up component. Therefore, the true predictive accuracy of the SASSI-A2 and the POSIT could not be measured behaviourally. If the participants were assessed using the SASSI-A2 and the POSIT during the initial assessment as a routine screening protocol and their substance use was reassessed at discharge, one could more accurately measure the predictive validity of the SASSI-A2 and the POSIT. Unfortunately, the researcher could only meet the youth once and had no control over which stage of the justice system the participants were in at the time of testing.

A fifth limitation was that Aboriginal youth were not included in this study. Therefore, it is unlikely that it accurately described the substance use problems of the full YFPS populations since a substantial percentage (approximately 20%) of YFPS clients were excluded from the current study because of their Aboriginal heritage. A future study that includes Aboriginal youth as participants is recommended.

A sixth limitation was that the administration of the APS-SF was not counterbalanced with the other instruments. The APS-SF scores might be affected by questions from the SASSI-A2 or the POSIT. As the SASSI-A2 and the POSIT were counterbalanced when administered, it would have been wise to include the APS-SF in the sequence of tests being administered.

A seventh limitation was that this study was conducted with a small number of participants. In spite of the researcher's efforts to maximize the sample size, the pool of available youth was exhausted after 16 months of recruiting participants. The small sample size has implications for the interpretation of the results of the current study, in particular determining statistically significant findings and the possibility of committing Type II errors, failure to reject the null hypothesis when it is false or failure to report a statistically significant relationship when one actually does exist. Power analyses provide an indication of the likelihood of making a Type II error, when the sample size, alpha level, and statistical results are known.

The lack of power due to the small sample size in the current study is illustrated in the following example. When comparing the measured reduction of drug consumption between the treated and untreated youth (page 42), the current sample size, even with a p value set at .10, generated a post-hoc power value of .17 (Kane, 2014), indicating only a 17% chance of detecting a true difference. When comparing the measured reduction of alcohol consumption between the youth in custody and the youth in the community (page 41), the current sample size, at a p value set at .05, generated a post-hoc power value of .454 (Kane, 2014), indicating only a 45.4%

chance of detecting true difference if, in fact, one was present. When a p value set at .075, it generated a post-hoc power value of .526 (Kane, 2014). If the sample size had been larger, the result might have been significant.

Another limitation related to the sample concerns the extent to which it might be generalized to youth throughout Vancouver Island, or more broadly to YCJS young offenders in British Columbia. Although the researcher exhausted an eligible participants list to conduct this study, the study should have included more participants from the north end of the island and, as mentioned previously, should have included Aboriginal youth in order to truly reflect the pattern of substance use among young offenders on Vancouver Island.

A final limitation was that not all participants had their FSIQ scores in their files even they were administered the WAIS-IV or the WISC-IV. Some participants only had their GAI scores instead of the FSIQ score. The researcher used what were available to conduct this research. However, the researcher recognizes that the FSIQ and the GAI are not same. If future research requires to collect the IQ scores, the researcher suggested to collect only one kind of score (either the FSIQ or the GAI).

4.4 Conclusion and Recommendations

This study successfully demonstrated the convergent validity of the POSIT and the SASSI-A2. Also, the criterion-related validity of the POSIT and the SASSI-A2 were demonstrated against the APS-SF as the criterion. Physical and mental health, peer relations, vocational status, social skills, and aggressive behaviours were also correlated with substance use scales. This study also showed that youth with behavioural problems are more likely to have substance use problems. The SASSI-A2 and the POSIT scores were significantly related to self-reported pre-admission alcohol usage. The POSIT was not significantly correlated with self-reported pre-admission drug usage, but the SASSI-A2 was significantly related to self-reported pre-admission drug usage. The SASSI-A2 was significantly related to pre-admission alcohol and drug usage better than the POSIT and the APS-SF. Analyses indicated that participation in treatment was not significantly related to change in alcohol or drug usage from pre- to post-admission. Only pre-admission alcohol and drug use frequency significantly predicted change in alcohol and drug use from pre- to post-admission.

This study clearly indicated an elevated prevalence of substance use among the participants. YFPS offers youth in contact with the law various treatment services. The youth

were treated mainly for their violence, sexual misconduct, other misbehaviours (i.e., stealing) and general mental health. Unfortunately, the service did not include in-clinic specialized substance use treatment. Therefore, more substance use treatment should be offered to the clients at YFPS. The results of this study suggest greater attention to substance use problems for youth is needed, and more should be done for youth to treat their substance use issues.

The SASSI-A2 is a well-known screening tool to identify substance use problems. This study demonstrated that the SASSI-A2 is as good a measure as the APS-SF and the POSIT. If a clinician looks for alcohol use and drug use problems separately, the SASSI-A2 probably may be a better tool than the APS-SF and the POSIT as it measures alcohol and other drug separately.

The POSIT is a good first step, screening tool to identify substance use problems. In addition, the POSIT also identifies problem areas such as family and peer relations, education, vocation, social skills, mental and physical health, aggressive behaviour, and leisure activities. Multiscreening tools, such as the POSIT, that measure problems are usually expensive. Although the POSIT is not as popular as other similar tools used in the field, it is time- and cost-efficient, and a good substitute for expensive multiscreening tools. The researcher recommends the use of the POSIT at YFPS to screen for substance use problems.

This study produced a number of directions for future research. First and foremost, a similar study including Aboriginal youth should be conducted. Although this study describes the pattern of substance use of young offenders on Vancouver Island, British Columbia, Aboriginal youths were excluded from this study. The research estimated that about 20% of clients who were admitted to YFPS at the time of data collection were Aboriginal. Therefore, the researcher recommends to include this population for future research.

As Brannigan et al. (2004) indicated, the researcher also recommends that substance use treatment outcome evaluation to be conducted. The researcher was not able to investigate substance use treatment programs that the youth attended. Details such as contents of treatment, lengths that the youth attended, and settings of treatment are important factors to consider when evaluating treatment effectiveness. Future research should address details about substance abuse treatment for young offenders on Vancouver Island.

A final recommendation for future research is to conduct a longitudinal predictive study. Since the researcher was not able to obtain pre-admission substance use data at the time of admission, participants had to respond retrospectively. In an ideal study design, all pre-

admission information would be gathered at the time of admission. Then, the post-admission information would be gathered approximately six months after admission dates. Then at some point after termination of participants' involvement with YFCS (a few months to a few years), follow-up substance use and recidivism data would be collected.

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Appendix A

Consent Form provided to youth



Examining Accuracy of Tests on Substance Use and Patterns of Substance Use Behaviours in a Sample of Youth Offenders Referred to a Community-based Forensic Psychiatry Program

You are invited to participate in a research study about the use of drug and alcohol by youth who come into YFPS. Please read this form carefully, and feel free to ask any questions you might have about the study.

Student-Researcher: Sarah Takahashi, Department of Psychology,
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Supervisors: Dr. J. Stephen Wormith, Department of Psychology,
University of Saskatchewan, Tel: (306) 966-6818,
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Purpose and Procedure: The purpose of this study is to conduct a survey of the youth who come to YFPS clinics. If you agree to take part in this project, you will be asked to fill out two forms and take part in a brief interview with the researcher. The survey forms are called Adolescent Substance Abuse Subtle Screening Inventory (SASSI-A2) and Problem Oriented Screening Instrument for Teenagers (POSIT). They are designed to see if you might have any problems with drugs or alcohol use, and if so, what those problems might be. Our interests as researchers are to see how many youth who are in trouble with the law use drugs and/or alcohol, what kind of drugs/alcohol do youth use, and whether their use of drugs/alcohol causes other problems. Therefore, the second purpose of this study is to identify the patterns of substance use in youth who have trouble with the law. The results of this study will help workers at YFPS to learn more about substance use among youth who attend YFPS. Also, this will help future youth who come to YFPS and have substance use problems and need of treatment. In the end, this study will help workers to develop better substance use programs for youth in need of treatment. Therefore, you are invited to participate in this written survey and interview. The survey will take about 45 minutes and the interview will take place after the survey for about 5 to 10 minutes. The interviewer will take notes during the interview, and information obtained from the survey and the interview will be taken with the interviewer at the end of the interview. Information such as drug and alcohol use patterns, mental health related information, and demographic information will be collected during this project. In addition, the interviewer will access your files at YFPS to collect additional data such as demographic information and psycho-social history, and psychiatric records. No information will be given to any staff of YFPS. In fact, YFPS staff will not be told which youth agree to take part in this project.

Risks/Benefits: There are no known risks associated with taking part in this project. You will not receive any personal benefit from taking part in the study, although you will be given \$5 gift card as a payment for your time at the end of the survey. At the end of the survey, you will be given a chance to give any further comments or ask any questions that you might have about the project. We hope that the results may help workers at YFPS and other locations to identify substance use problems among youth and to develop better substance use treatment programs that fit the needs of youth who are in trouble with the law.

If you wish, YFPS workers will be available to speak with you about any issues that may come up during or after the interview and survey with the researcher. If you are having a negative emotional experience and need immediate assistance, YFPS staff will be available.

Storage of Data: Any information provided during the survey will be kept in a secure location, stored and locked in cabinets at the University of Saskatchewan for the minimum of five years after the end of the study. Then it will be destroyed. The information will not be available to anyone but the research team.

Confidentiality: Every effort will be made to protect your confidentiality. Your responses and other data collected from your files will be given a special ID and kept separately from your personal information. The information collected from you will be stored under this ID number. However, it is possible that you may be identifiable to other people who know you on the basis of what you have said. However your information will be combined and reported with others so that you cannot be identified in any research reports. Your name and any information that you give will not be quoted in any reports. The results from this study may be published and presented at conferences, but your identity will be kept confidential. This consent form will be stored separately from your survey and interview material so that it will not be possible to associate you with any information. It will be stored for five years and then be destroyed beyond the recovery.

There may be limits to confidentiality in special instances. For example, if you disclose self-incriminating information about any new offences, information about child abuse or intent to harm yourself or others, I am required to report these to the proper authorities for your own protection and the protection of others.

Right to withdraw: Your participation is voluntary, and you may stop at any time without penalty of any sort. You may answer only the questions you feel comfortable with. If you withdraw from the study, any information that you have contributed until that point will be destroyed. Your right to withdraw your information from the study exists until your information has been grouped with the information from other participants. Also, your clinicians, caseworker, or Probation Officer will not be told that you have withdrawn from participation, so your decision will not affect your probation order.

Questions: If you have any questions concerning the study, please feel free to ask the researchers at any point by calling or sending email to Sarah Takahashi at the contact information provided above. You can also contact the researchers if you have questions at a

later time. The results of this evaluation will be available in the Fall of 2012. You may obtain a copy of the results of the study by contacting a researcher or the supervisor using the contact information provided above.

This research was reviewed and approved on ethics ground by the University of Saskatchewan Behavioural Research Ethics Board (BEH 11-150) on December 19th 2011. Any questions regarding your rights as a participant may be addressed to the Behavioural Research Ethics Board through the Ethics Office (966-2084). Out of town participants may call collect.

Consent to Participate: I have read and understand the description of the research study provided above. I agree to participate in the study described above, understanding that I may withdraw my consent to participate at any time. Completion of the survey and interview will constitute consent to participate and permission for the researcher to use the data gathered in the manner described above. You will be given a copy of the consent form for your records.

Name of Participant

Date

Signature of Participant

Signature of Researcher

Appendix B

Guardian Consent Form provided to parents or care workers



Examining Accuracy of Tests on Substance Use and Patterns of Substance Use Behaviours in a Sample of Youth Offenders Referred to a Community-based Forensic Psychiatry Program

Your son/daughter is invited to participate in a research study entitled “*Concurrent and Convergent Validity of Substance Use Psychometric Measures and Patterns of Substance Use in a Sample of Youth Offenders Referred to a Community-based Forensic Psychiatry Program.*” Since he/she is under age of 16 years old, I would like to obtain permission from you to contact your son/daughter. Please read this form carefully, and feel free to ask any questions you might have about the study.

Student-Researcher: Sarah Takahashi, Department of Psychology,
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Tel: (306) 966-1605, Email: sarah.takahashi@usask.ca

Supervisor: Dr. J. Stephen Wormith, Department of Psychology,
University of Saskatchewan, Tel: (306) 966-6818,
Email: s.wormith@usask.ca

Purpose and Procedure: The purpose of this study is to conduct a survey of the youth who come to YFPS clinics. If your child agrees to take part in this project, he/she will be asked to fill out two forms and take part in a brief interview with the researcher. The survey forms are called Adolescent Substance Abuse Subtle Screening Inventory (SASSI-A2) and Problem Oriented Screening Instrument for Teenagers (POSIT). They are designed to see if your son/daughter might have any problems with drugs or alcohol use, and if so, what those problems might be. Our interests as researchers are to see how many youth who are in trouble with the law use drugs and/or alcohol, what kind of drugs/alcohol do youth use, and whether their use of drugs/alcohol causes other problems. Therefore, the second purpose of this study is to identify the patterns of substance use in youth who have trouble with the law. The results of this study will help workers at YFPS to learn more about substance use among youth who attend YFPS. Also, this will help future youth who come to YFPS and have substance use problems and need of treatment. In the end, this study will help workers to develop better substance use programs for youth in need of treatment. Therefore, your son/daughter is invited to participate in this written survey and interview. The survey will take about 45 minutes and the interview will take place after the survey for about 5 to 10 minutes. The interviewer will take notes during the interview, and information obtained from the survey and the interview will be taken with the interviewer at the end of the interview. Information such as drug and alcohol use patterns, mental health related information, and demographic information will be collected during this project. In addition, the interviewer will access your son's/daughter's

files at YFPS to collect additional data such as demographic information and psycho-social history, and psychiatric records. No information will be given to any staff of YFPS. In fact, YFPS staff will not be told which youth agree to take part in this project.

Risks/Benefits: There are no known risks associated with taking part in this project. Your son/daughter will not receive any personal benefit from taking part in the study, although he/she will be given \$5 gift card as a payment for his/her time at the end of the survey. At the end of the survey, your son/daughter will be given a chance to give any further comments or ask any questions that he/she might have about the project. We hope that the results may help workers at YFPS and other locations to identify substance use problems among youth and to develop better substance use treatment programs that fit the needs of youth who are in trouble with the law.

If you wish, YFPS workers will be available to speak with you about any issues that may come up during or after the interview and survey with the researcher. If you are having a negative emotional experience and need immediate assistance, YFPS staff will be available.

Storage of Data: Any information provided during the survey will be kept in a secure location, stored and locked in cabinets at the University of Saskatchewan for the minimum of five years after the end of the study. Then it will be destroyed. The information will not be available to anyone but the research team.

Confidentiality: Every effort will be made to protect your son's/daughter's confidentiality. His/her responses and other data collected from his/her files will be given a special ID and kept separately from his/her personal information. The information collected from him/her will be stored under this ID number. However, it is possible that he/she may be identifiable to other people who know him/her on the basis of what he/she has said. However your son's/daughter's information will be combined and reported with others so that he/she cannot be identified in any research reports. His/her name and any information that he/she give will not be quoted in any reports. The results from this study may be published and presented at conferences, but his/her identity will be kept confidential. This consent form will be stored separately from his/her survey and interview material so that it will not be possible to associate him/her with any information. It will be stored for five years and then be destroyed beyond the recovery.

There may be limits to confidentiality in special instances. For example, if your son/daughter disclose self-incriminating information about any new offences, information about child abuse or intent to harm himself/herself or others, I am required to report these to the proper authorities for his/her own protection and the protection of others.

Right to withdraw: Your son's/daughter's participation is voluntary, and he/she may stop at any time without penalty of any sort. He/she may answer only the questions he/she feels comfortable with. If your son/daughter withdraws from the study, any information that he/she has contributed until that point will be destroyed. His/her right to withdraw his/her information from the study exists until his/her information has been grouped with the information from other participants. Also, your son's/daughter's clinicians, caseworker, or Probation Officer

will not be told that he/she has withdrawn from participation, so his/her decision will not affect his/her probation order.

Questions: If you have any questions concerning the study, please feel free to ask the researchers at any point by calling or sending email to Sarah Takahashi at the contact information provided above. You can also contact the researchers if you have questions at a later time. The results of this evaluation will be available in the Fall of 2012. You may obtain a copy of the results of the study by contacting a researcher or the supervisor using the contact information provided above.

This research was reviewed and approved on ethics ground by the University of Saskatchewan Behavioural Research Ethics Board (BEH 11-150) on December 19th 2011. Any questions regarding your rights as a participant may be addressed to the Behavioural Research Ethics Board through the Ethics Office (966-2084). Out of town participants may call collect.

Consent to Give Permission:I have read and understand the description of the research study provided above. I agree to give permission to researchers to contact my son/daughter to invite him/her to the study described above.

Name of Parents

Date

Signature of Parents

Signature of Researcher



**Validation of Substance Use Psychometric Measures and Patterns of Substance Use in Youth Referred to YFPS
For YFPS Clinician: Description of Study**

Researchers from the University of Saskatchewan are conducting a research study to look at how prevalent substance use and abuse problem is among youth who have come in conflict with the law, and how the current substance use and abuse testing is effective in identifying the problem accurately. Because you are a Youth Forensic Psychiatric Services client, you are invited to participate in a research study entitled “*Concurrent and Convergent Validity of Substance Use Psychometric Measures and Patterns of Substance Use in a Sample of Youth Offenders Referred to a Community-based Forensic Psychiatry Program.*”

Purpose and Procedure: The purpose of this study is to examine how well the Adolescent Substance Abuse Subtle Screening Inventory (SASSI-A2) and the Problem Oriented Screening Instrument for Teenagers (POSIT) identify substance use problems among youth who have trouble with the law. The second purpose of this study is to identify the patterns of substance use in youth who have been in trouble with the law. The results of this study will assist clinicians to diagnose substance use disorder among youth more accurately. This study will also help youth who have substance use disorder and need appropriate treatment since accurate diagnosis helps clinicians to refer youth to the appropriate treatment program. In order to obtain the patterns of substance use in youth such as yourself, you are invited to participate in a written survey and an interview. The survey will take approximately 45 minutes and the interview will take place after the survey for approximately 5 to 10 minutes. The interviewer will take notes during the interview, and information obtained from the survey and the interview will be coded and entered into the database. The information you provide will be combined with information from other participants. Therefore, your identity will not be known and the information you provide may not be linked to you.

If decide to participate in the study, you will receive a Tim Horton gift certificate for your participation. Your participation in the study is voluntary. This means that if you decide not to participate in the study, there will be no negative consequences for you. Also, clinicians will not know if you decide to participate, so you are free to decide if you want to participate or not. All of the comments and information you provide will be confidential. Only researchers will have access to the information that you provide. Therefore, YFPS clinicians, your care workers, probation officer, the judge, and parents will not know what you say in the interview or write in the survey.

At the end of the survey, you will be given a chance to provide any further comments that you might have. The results may benefit the clinicians and the institutions to identify substance use problems among youth and develop better substance use treatment programs that fit individual youth’s needs.

If you have questions, you can contact Sarah Takahashi from University of Saskatchewan, at (250)760-0403 or sarah.takahashi@usask.ca.



**Validation of Substance Use Psychometric Measures and Patterns of
Substance Use in Youth Referred to YFPS
YFPS Clinician Youth Contact Script**

Researchers from the University of Saskatchewan are conducting a research study to look at how prevalent substance use and abuse problem is among youth who have come in conflict with the law, and how the current substance use and abuse testing is effective in identifying the problem accurately. Because you are a Youth Forensic Psychiatric Services client, the researchers would like to invite you to participate in the study so that they will have a better understanding about substance use and abuse issues among youth in the justice system.

Your participation in the study is voluntary. This means that if you decide not to participate in the study, there will be no negative consequences for you. Also, clinicians will not know if you decide to participate, so you are free to decide if you want to participate or not. All of the comments and information you provide will be confidential. Only researchers will have access to the information you share with researchers so that YFPS clinicians, your care workers, probation officer, the judge, and parents will not know what you comment in the study. If participate in the study, you will receive a Tim Horton's gift certificate for participating in the study at the time of completion.

Your clinician is talking with you to ask your permission to give your name and phone number to the researchers so that they can talk with you more about the study and explain what would be involved in detail. Please check "yes" or "no" box below. If you check "yes," please write your name and phone number below. "Yes" does not mean that you must participate in the study, only that the researcher may contact you to invite you to participate in the study. After you fill your answer, please return this form in the envelope.

Yes: "I agree to allow you to give my name and number to the researcher to discuss the project further."

No: "I am not interested in participating in the study."

Consent (to be completed by youth)

I (your name) _____ give permission to
(clinician) _____ to give my name and telephone number to Dr. Stephen
Wormith, Department of Psychology, University of Saskatchewan.

Name of Youth: _____

Phone Number: _____



Validation of Substance Use Psychometric Measures and Patterns of Substance Use in Youth Referred to YFPS
YFPS Clinician Parental/ Guardian Contact Script

Researchers from the University of Saskatchewan are conducting a research study to look at how prevalent substance use and abuse problem is among youth who have come in conflict with the law, and how the current substance use and abuse testing is effective in identifying the problem accurately. Because [name of client] is a Youth Forensic Psychiatric Services client, the researchers would like to invite [him/her] to participate in the study so that they will have a better understanding about substance use and abuse issues among youth in the justice system.

[Client]’s participation in the study is voluntary. This means that if [client] decides not to participate in the study, there will be no negative consequences for [him/her]. All of the comments and information provided by the participants, including [client], will be confidential and only used for research purposes. [Name of client]’ would receive a Tim Horton’s gift certificate for participating in the study.

I am contacting you to ask your permission to give your name and phone number to the researchers so that they can talk with you about the study and explain what would be involved in more detail. This does not mean that [client] must participate in the study, only that the researcher may contact you to invite [client] to participate in the study.

Yes: “I agree to allow you to give our names and numbers to the researchers to discuss the project further.”

No: “I am not interested in having [client] participate in the study.”

Consent (to be completed by YFPS staff)

I received permission from _____ to give his/her name and telephone number to Dr. Stephen Wormith, Department of Psychology, University of Saskatchewan.

Name of Parent: _____

Name of Youth: _____

Phone Number: _____

Appendix F

Problem Oriented Screening Inventory for Teenagers (National Institute on Drug Abuse, 1991)

1. Do you have so much energy you don't know what to do with it? Yes No
2. Do you brag? Yes No
3. Do you get into trouble because you use drugs or alcohol at school? Yes No
4. Do your friends get-bored at parties when there is no alcohol served? Yes No
5. Is it hard for you to ask for help from others? Yes No
6. Has there been adult supervision at the parties you have gone to recently? Yes No
7. Do your parents or guardians argue a lot? Yes No
8. Do you usually think about how your actions will affect others? Yes No
9. Have you recently either lost or gained more than 10 pounds? Yes No
10. Have you ever been intimate with someone who shot up drugs? Yes No
11. Do you often feel tired? Yes No
12. Have you had trouble with stomach pain or nausea? Yes No
13. Do you get easily frightened? Yes No
14. Have any of your best friends dated regularly during the past year? Yes No
15. Have you dated regularly in the past year? Yes No
16. Do you have a skill, craft, trade or work experience? Yes No
17. Are most of your friends older than you are? Yes No
18. Do you have less energy than you think you should? Yes No
19. Do you get frustrated easily? Yes No
20. Do you threaten to hurt people? Yes No
21. Do you feel alone most of the time? Yes No
22. Do you sleep either too much or too little? Yes No
23. Do you swear or use dirty language? Yes No
24. Are you a good listener? Yes No
25. Do your parents or guardians approve of your friends? Yes No
26. Have you lied to anyone in the past week? Yes No
27. Do your parents or guardians refuse to talk with you when they are mad at you? Yes No
28. Do you rush into things without thinking about what could happen? Yes No
29. Did you have a paying job last summer? Yes No
30. Is your free time spent just hanging out with friends? Yes No

31. Have you accidentally hurt yourself or someone else while high on alcohol or drugs? Yes No
32. Have you had any accidents or injuries that still bother you? Yes No
33. Are you a good speller? Yes No
34. Do you have friends who damage or destroy things on purpose? Yes No
35. Have the whites of your eyes ever turned yellow? Yes No
36. Do your parents or guardians usually know where you are and what you are doing? Yes No
37. Do you miss out on activities because you spend too much money on drugs or alcohol? Yes No
38. Do people pick on you because of the way you look? Yes No
39. Do you know how to get a job if you want one? Yes No
40. Do your parents or guardians and you do lots of things together? Yes No
41. Do you get A's and B's in some classes and fail others? Yes No
42. Do you feel nervous most of the time? Yes No
43. Have you stolen things? Yes No
44. Have you ever been told you are hyperactive? Yes No
45. Do you ever feel you are addicted to alcohol or drugs? Yes No
46. Are you a good reader? Yes No
47. Do you have a hobby you are really interested in? Yes No
48. Do you plan to get a diploma (or already have one)? Yes No
49. Have you been frequently absent or late for work? Yes No
50. Do you feel people are against you? Yes No
51. Do you participate in team sports which have regular practices? Yes No
52. Have you ever read a book cover to cover for your own enjoyment? Yes No
53. Do you have chores that you must regularly do at home? Yes No
54. Do your friends bring drugs to parties? Yes No
55. Do you get into fights a lot? Yes No
56. Do you have a hot temper? Yes No
57. Do your parents or guardians pay attention when you talk to them? Yes No
58. Have you started using more and more drugs or alcohol to get the effect you want? Yes No
59. Do your parents or guardians have rules about what you can and cannot do? Yes No
60. Do people tell you that you are careless? Yes No
61. Are you stubborn? Yes No
62. Do any of your best friends go out on school nights without permission from their parents or guardians? Yes No

63. Have you ever had or do you now have a job? Yes No
64. Do you have trouble getting your mind off things? Yes No
65. Have you ever threatened anyone with a weapon? Yes No
66. Do you have a way to get to a job? Yes No
67. Do you ever leave a party because there is no alcohol or drugs? Yes No
68. Do your parents or guardians know what you really think or feel? Yes No
69. Do you often act on the spur of the moment? Yes No
70. Do you usually exercise for a half hour or more at least once a week? Yes No
71. Do you have a constant desire for alcohol or drugs? Yes No
72. Is it easy to learn new things? Yes No
73. Do you have trouble with your breathing or with coughing? Yes No
74. Do people your own age like and respect you? Yes No
75. Does your mind wander a lot? Yes No
76. Do you hear things no one else around you hears? Yes No
77. Do you have trouble concentrating? Yes No
78. Do you have a valid driver's license? Yes No
79. Have you ever had a paying job that lasted at least one month? Yes No
80. Do you and your parents or guardians have frequent arguments which involve yelling and screaming? Yes No
81. Have you had a car accident while high on alcohol or drugs? Yes No
82. Do you forget things you did while drinking or using drugs? Yes No
83. During the past month have you driven a car while you were drunk or high? Yes No
84. Are you louder than other kids? Yes No
85. Are most of your friends younger than you are? Yes No
86. Have you ever intentionally damaged someone else's property? Yes No
87. Have you ever stopped working at a job because you just didn't care? Yes No
88. Do your parents or guardians like talking with you and being with you? Yes No
89. Have you ever spent the night away from home when your parents didn't know where you were? Yes No
90. Have any of your best friends participated in team sports which require regular practices? Yes No
91. Are you suspicious of other people? Yes No
92. Are you already too busy with school and other adult supervised activities to be interested in a job? Yes No
93. Have you cut school at least 5 days in the past year? Yes No
94. Are you usually pleased with how well you do in activities with your friends? Yes No

95. Does alcohol or drug use cause your moods to change quickly like from happy to sad or vice versa? Yes No
96. Do you feel sad most of the time? Yes No
97. Do you miss school or arrive late for school because of your alcohol or drug use? Yes No
98. Is it important to you now to get or keep a satisfactory job? Yes No
99. Do your family or friends ever tell you that you should cut down on your drinking or drug use? Yes No
100. Do you have serious arguments with friends or family members because of your drinking or drug use? Yes No
101. Do you tease others a lot? Yes No
102. Do you have trouble sleeping? Yes No
103. Do you have trouble with written work? Yes No
104. Does your alcohol or drug use ever make you do something you would not normally do like breaking rules, missing curfew, or breaking the law? Yes No
105. Do you feel you lose control and get into fights? Yes No
106. Have you ever been fired from a job? Yes No
107. During the past month, have you skipped school? Yes No
108. Do you have trouble getting along with any of your friends because of your alcohol or drug use? Yes No
109. Do you have a hard time following directions? Yes No
110. Are you good at talking your way out of trouble? Yes No
111. Do you have friends who have hit or threatened to hit someone without any real reason? Yes No
112. Do you ever feel you can't control your alcohol or drug use? Yes No
113. Do you have a good memory? Yes No
114. Do your parents or guardians have a pretty good idea of your interests? Yes No
115. Do your parents or guardians usually agree about how to handle you? Yes No
116. Do you have a hard time planning and organizing? Yes No
117. Do you have trouble with math? Yes No
118. Do your friends cut school a lot? Yes No
119. Do you worry a lot? Yes No
120. Do you find it difficult to complete class projects or work tasks? Yes No
121. Does school sometimes make you feel stupid? Yes No
122. Are you able to make friends easily in a new group? Yes No
123. Do you often feel like you want to cry? Yes No
124. Are you afraid to be around people? Yes No
125. Do you have friends who have stolen things? Yes No
126. Do you want to be a member of any organized group, team, or club?
127. Does one of your parents or guardians have a steady job?

128. Do you think it's a bad idea to trust other people?
129. Do you enjoy doing things with people your own age?
130. Do you feel you study longer than your classmates and still get poorer grades?
131. Have you ever failed a grade in school?
132. Do you go out for fun on school nights without your parents' permission?
133. Is school hard for you?
134. Do you have an idea about the type of job or career that you want to have?
135. On a typical day, do you watch more than two hours of TV?
136. Are you restless and can't sit still?
137. Do you have trouble finding the right words to express what you are thinking?
138. Do you scream a lot?
139. Have you ever had sexual intercourse without using a condom?

Appendix G
Interview Guide

Yes=1

No=0

Demographics

1. Current Age (age at data collection day)
2. Age at first substance use
3. Age at first contact with the law
4. Age at first criminal offence
5. Number of prior arrests (criminal commitments)
6. Type of crime (index offence)
7. Pathology (current)
 - Yes: What is it?
 - No
 - History of pathology:
8. Family problem
 - Yes: What is it?
 - No
9. Single parents
 - Yes
 - No
10. Conduct problems
 - Yes: What is it?
 - No
11. Effective use of leisure time
 - Yes:

List of Activity:

-
- No

12. Delinquent peer association

- Yes
- No

13. Education (Final grade completed)

14. Length of first incarceration (month)

15. Index offence sentence length (month)

16. Number of out of home placements

- Number of home placed
- Total length of out of home placement (month)

17. Abuse History

- Yes:
 - Physical
 - Sexual
 - Psychological
 - Other
- No

18. Gender

- Male
- Female

19. Ethnic Origin (self-selected by youth)

- Caucasian (English Canadian)
- European
- Asian
- North American Indian/Aboriginal Canadian (First Nations, Métis, Inuit)
- East Indian
- Latin, Central and South American
- Others
- Prefer Not to Answer

Substance Use/Abuse

20. Alcohol

- Alcohol Use
 - Yes
 - Type of alcohol used:
 - No
- Frequency of drinking (prior to YFPS admission)
 - Do not drink at all
 - About once a month
 - Two to three times a month
 - Once or twice a week
 - Three to four times a week
 - Nearly everyday
 - Once a day or more
- Amount of drinking per day (prior to YFPS admission)
 - 0 glasses
 - One or two glasses
 - Three to five glasses
 - Six or more glasses
- How much do you drink in a week? (prior to YFPS admission)

Day of Week	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Number of Drinks							

- Frequency of drinking (after YFPS admission)
 - Do not drink at all
 - About once a month
 - Two to three times a month
 - Once or twice a week
 - Three to four times a week
 - Nearly everyday

- Once a day or more
- Amount of drinking per day (after YFPS admission)
 - 0 glasses
 - One or two glasses
 - Three to five glasses
 - Six or more glasses
- How much do you drink in a week? (after to YFPS admission)

Day of Week	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Number of Drinks							

- Time abstinent from alcohol use (Months/Days)

21. Drug

- Drug Use
 - Yes:
 - Type of drug used:
 - No
- Frequency of substance use (other than alcohol) (prior to YFPS admission)
 - Do not use at all
 - About once a month
 - Two to three times a month
 - Once or twice a week
 - Three to four times a week
 - Nearly everyday
 - Once a day or more
- When did you use substance in last week?

Day of Week	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Number of Drinks							

- Frequency of substance use (other than alcohol) (after YFPS admission)

- Do not use at all
- About once a month
- Two to three times a month
- Once or twice a week
- Three to four times a week
- Nearly everyday
- Once a day or more
- Time abstinent from substance use (other than alcohol) (Months/Days)

Substance Use Treatment

22. Substance Use Treatment Court ordered?

- Yes
- No

23. Referred to treatment

- Yes:
 - Outpatient Clinic
 - Long-stay residential home
 - Others
- No

24. Treatment received?

- Yes: Date received (year/month)
- No

25. Treatment complete?

- Yes: Date completed (year/month)
- No

Standardized Neuropsychological Assessment Score

26. Wechsler Adult Intelligence Scale (WAIS) or Wechsler Intelligence Scale for Children (WISC)

- FIQ Score

- Date of Assessment
27. Woodcock Johnson Achievement Test (WJ-III)
- Score
 - Date of Assessment
28. Adolescent Psychopathology Scale
- Long form (1) vs Short form (2)
 - Score
 - Date of Assessment
29. Adolescent Substance Abuse Subtle Screening Inventory(SASSI-A2)
- Score
 - Date of assessment
30. Problem Oriented Screening Inventory for Teenagers (POSIT)
- Score
 - Date of Assessment
31. Clinical Diagnosis for Substance Abuse/Dependence
- Date of Clinical Assessment
 - Diagnosed(=1): Diagnosis:_____
 - Diagnosis indicated(=2)Diagnosis:_____
 - No Diagnosis (=0)
32. Time between clinical assessment and SASSI-A2/POSIT administration (Months)

Appendix H

Correlation Matrix for hypothesis 3, 8, 10, and 12

IQ	Readin	Math	Writin	AlcPre	AlcPre	DrugPr	AlcPost	AlcPost	Amo	Amo	stFreq	DrugPo	APS:S	POSIT	SASSI:	SASSI:
	g	g	g	Amo	Amo	eFreq	Freq	Freq	Amo	Amo	stFreq	UB	UB	:A	FVA	FVOD
IQ	.659**	.629**	.469**	.097	-.151	.012	.168	-.066	-.077	.204	.036	.036	.036	-.075	.001	
Rreadi	.659**		.566**	.110	.061	.003	.314*	.175	.030	.285	.028	.285	.285	.106	.076	
ng																
Math	.629**	.646**	.454**	-.087	-.130	-.077	.133	-.039	-.074	.032	-.092	-.071	-.062			
Writing	.469**	.566**	.454**	.151	-.050	.064	.154	-.084	-.127	.229	.114	.085	.162			
AlcPre	.097	.110	-.087	.151	.587**	.571**	.330**	.124	.168	.443**	.567**	.657**	.423**			
Freq																
AlcPre	-.151	.061	-.130	-.050	.587**	.607**	.387**	.500**	.496**	.326**	.393**	.549**	.409**			
Amo																
DrugPr	.012	.003	-.077	.064	.571**	.607**	.183	.230	.556**	.464**	.530**	.461**	.634**			
eFreq																
AlcPost	.168	.314*	.133	.154	.330**	.183	.680**	.451**	.380**	.380**	.380**	.380**	.198			
Freq																
AlcPost	-.066	.175	-.039	-.084	.500**	.230	.680**	.560**	.200	.144	.211	.146				
Amo																
DrugPo	-.077	.030	-.074	-.127	.496**	.556**	.451**	.560**	.418**	.344**	.287*	.417**				
stFreq																
APS:S	.207	.285	.032	.229	.326**	.464**	.369**	.200	.418**	.502**	.549**	.531**				
UB																
POSIT:	.036	.028	-.092	.114	.393**	.530**	.380**	.144	.344**	.502**	.580**	.652**				
A																
SASSI:	-.075	.106	-.071	.085	.657**	.549**	.461**	.380**	.211	.287*	.580**	.706**				

SASSI:	-.075	.106	-.071	.085	.657**	.549**	.461**	.380**	.211	.287*	.549**	.580**	.706**
FVD													
SASSI:	.001	.076	-.062	.162	.423**	.409**	.634**	.198	.146	.417**	.531**	.652**	.706**
FVOD													

*correlation is significant at the 0.05 level, ** significant at the 0.01 level

Appendix I

Correlation Matrix for hypothesis for 4, 5, 6, and 7

	C	O	S	A	A	G	P	D	E	S	S	I	A	B	C	D	E	F	G	H	I	J	F	F	F	A	S	O	S	D	S	D	e			
	N	P	U	V	D	A	T	E	A	U	C	P										V	V	R	T	Y	A	A	E	A	c	i				
	D	D	B	P	P	D	S	P	T	I	P	P										A	O	I	S	T	M	T	E	M	i	o				
																						D	D	K										n		
C																																		.312*		
N																																			.346**	
D																																			-.274*	
O																																			.376**	
P																																			.371**	
D																																			.366**	
S																																			.181	
U																																			.312*	
B																																			.449**	
A																																			.387**	
V																																			.355**	
P																																			.214	
A																																			.221	
V																																				.223
P																																				.339**
A																																			.185	
V																																				.333**
P																																				.159
A																																				.207
V																																				.381**
P																																				.251*
A																																				.261*
V																																				.312*
P																																				.404**
A																																				.288*
V																																				.239
P																																				.287*
A																																				.211
V																																				.126
P																																				.257*
A																																				.271*
V																																				.411**
P																																				.616**
A																																				.663**
V																																				.542**
P																																				

.414**	.366**	.185	.075	.122	.306*	.240*
.371**	.339**	.221	.048	.159	.211	.177
-.505**	-.438**	-.384**	-.134	-.228	-.386**	-.350**
.539**	.545**	.501**	.013	.382**	.401**	.362**
.483**	.433**	.404**	.153	.233	.394**	.246*
.496**	.420**	.276*	.201	.155	.284*	.273*
.261*	.262*	.202	.035	.259*	.358**	.221
.357**	.319**	.241*	.129	.284*	.319**	.288*
.377**	.355**	.246*	.120	.152	.236	.270*
.413**	.305*	.167	.088	.063	.133	.164
.502**	.81**	.338**	.110	.266*	.246*	.286*
.193	.114	.179	-.147	.088	.087	.090
.543**	.452**	.343**	.144	.262*	.434**	.469**
.414**	.395**	.320**	.042	.069	.226	.217
.652**	.580**	.519**	.100	.246*	.464**	.435**
.503**	.419**	.284*	.225	.173	.295*	.307*
.320**	.387**	.313**	.204	.328**	.602**	.474**
.722**	.683**	.661**	.260*	.489**	.589**	.663**
.668**	.533**	.500**	.266*	.276*	.421**	.380**
.445**	.381**	.177	.168	.030	.186	.220
.651**	.782**	.710**	.449**	.557**	.731**	
.481**	.625**	.650**	.321**	.644**		.731**
.338**	.493**	.569**	.096		.644**	.557**
.282*	.248*	.274*		.096	.321**	.449**
.732**	.841**		.274*	.569**	.650**	.710**
.831**		.841**	.248*	.493**	.625**	.782**
	.831**	.732**	.282*	.338**	.481**	.651**
.631**	.521**	.506**	.097	.350**	.433**	.470**
.627**	.620**	.548**	.248*	.481**	.506**	.629**
.236	.168	.010	.101	.071	.004	.154
.606**	.577**	.530**	.157	.415**	.463**	.568**
.271*	.257*	.126	.211	.287*	.239	.288*
G A D	P T S	D E P	E A T	S U I	S C P	I P P

.414**	.366**	.185	.075	.122	.306*	.240*
.371**	.339**	.221	.048	.159	.211	.177
-.505**	-.438**	-.384**	-.134	-.228	-.386**	-.350**
.539**	.545**	.501**	.013	.382**	.401**	.362**
.483**	.433**	.404**	.153	.233	.394**	.246*
.496**	.420**	.276*	.201	.155	.284*	.273*
.261*	.262*	.202	.035	.259*	.358**	.221
.357**	.319**	.241*	.129	.284*	.319**	.288*
.377**	.355**	.246*	.120	.152	.236	.270*
.413**	.305*	.167	.088	.063	.133	.164
.502**	.81**	.338**	.110	.266*	.246*	.286*
.193	.114	.179	-.147	.088	.087	.090
.543**	.452**	.343**	.144	.262*	.434**	.469**
.414**	.395**	.320**	.042	.069	.226	.217
.652**	.580**	.519**	.100	.246*	.464**	.435**
.503**	.419**	.284*	.225	.173	.295*	.307*
.320**	.387**	.313**	.204	.328**	.602**	.474**
.722**	.683**	.661**	.260*	.489**	.589**	.663**
.668**	.533**	.500**	.266*	.276*	.421**	.380**
.445**	.381**	.177	.168	.030	.186	.220
.651**	.782**	.710**	.449**	.557**	.731**	
.481**	.625**	.650**	.321**	.644**		.731**
.338**	.493**	.569**	.096		.644**	.557**
.282*	.248*	.274*		.096	.321**	.449**
.732**	.841**		.274*	.569**	.650**	.710**
.831**		.841**	.248*	.493**	.625**	.782**
	.831**	.732**	.282*	.338**	.481**	.651**
.631**	.521**	.506**	.097	.350**	.433**	.470**
.627**	.620**	.548**	.248*	.481**	.506**	.629**
.236	.168	.010	.101	.071	.004	.154
.606**	.577**	.530**	.157	.415**	.463**	.568**
.271*	.257*	.126	.211	.287*	.239	.288*
G A D	P T S	D E P	E A T	S U I	S C P	I P P

.622**	.451**	.373**	.434**	.591**	.295*	.334**
.597**	.565**	.418**	.381**	.541**	.361**	.400**
-.517**	-.633**	-.599**	-.433**	-.513**	-.533**	-.356**
.520**	.630**	.605**	.395**	.548**	.521**	.502**
.597**	.694**	.528**	.389**	.627**	.490**	.361**
.773**	.551**	.436**	.316**	.590**	.316**	.447**
.274*	.372**	.192	.359**	.402**	.217	.103
.540**	.489**	.423**	.490**	.572**	.334**	.418**
.652**	.428**	.421**	.313**	.520**	.284*	.364**
.580**	.305*	.385**	.142	.389**	.256*	.392**
.634**	.568**	.554**	.324**	.622**	.403**	.381**
.232	.216	.346**	.224	.354**	.182	.283*
.463**	.507**	.548**	.430**	.513**	.506**	.386**
.423**	.491**	.417**	.264*	.301*	.500**	
.396**	.631**	.704**	.356**	.367**		.500**
.570**	.547**	.522**	.439**		.367**	.301*
.296*	.443**	.469**		.439**	.356**	.264*
.423**	.628**		.469**	.522**	.704**	.417**
.594**		.628**	.443**	.547**	.631**	.491**
	.594**	.423**	.296*	.570**	.396**	.423**
.220	.380**	.663**	.474**	.307*	.435**	.217
.186	.421**	.589**	.602**	.295*	.464**	.226
.030	.276*	.489**	.328**	.173	.246*	.069
.168	.266*	.260*	.204	.225	.100	.042
.177	.500**	.661**	.313**	.284*	.519**	.320**
.381**	.533**	.683**	.387**	.419**	.580**	.395**414
.445**	.668**	.722**	.320**	.503**	.625**	.414**
.282*	.494**	.577**	.212	.394**	.595**	.325**
.392**	.525**	.598**	.390**	.430**	.511**	.405**
.502**	.323**	.239*	.232	.365**	.115	.336**
.290*	.524**	.535**	.278*	.368**	.522**	.315**
.404**	.312*	.261*	.251*	.381**	.207	.159
A	B	C	D	E	F	G

.461**	.350**	.524**	.553**	.662**	.697**
.404**	.485**	.523**	.493**	.642**	.713**
-.549**	-.175	-.615**	-.412**	-.453**	-.566**
.481**	.404**	.602**	.427**	.523**	.483**
.428**	.179	.641**	.411**	.496**	.531**
.536**	.262*	.617**	.724**	.713**	.590**
.284*	.199	.363**	.154	.349**	.399
.486**	.408**	.552**	.508**	.630**	
.347**	.258*	.473**	.706**		.630**
.323**	.234	.459**		.706**	.508**
.473**	.350**		.459**	.473**	.552**
.246*		.350**	.234	.258*	.408**
	.246*	.473**	.323**	.347**	.486**
.386**	.283*	.381**	.392**	.364**	.418**
.506**	.182	.403**	.256*	.284*	.334**
.513**	.354**	.622**	.389**	.520**	.572**
.430**	.224	.324**	.142	.313**	.490**
.548**	.346**	.554**	.385**	.421**	.423**
.507**	.216	.568**	.305*	.428**	.489**
.463**	.232	.634**	.580**	.652**	.540**
.469**	.090	.286*	.164	.270*	.288*
.434**	.087	.246*	.133	.236	.319**
.262*	.088	.266*	.063	.152	.284*
.144	-.147	.110	.088	.120	.129
.343**	.179	.338**	.167	.246*	.241*
.452**	.114	.381**	.305*	.355**	.319**
.543**	.193	.502**	.413**	.377**	.357**
.337**	.249*	.287*	.250*	.310*	.262*
.473**	.305**	.631**	.293*	.322**	.380**
.185	.333**	.381**	.549**	.531**	.412**
.339**	.223	.528**	.220	.228	.285*
.221	.214	.355**	.387**	.449**	.312*
H	I	J	F V A	F V O D	F R I S K

.518**	.698**	.526**	.554**	-.491**	.761**	
.385**	.607**	.629**	.685**	-.481**		.761**
-.261*	-.604**	-.746**	-.516**		-.481**	-.491**
.473**	.581**	.555**		-.516**	.685**	.554**
.225	.616**		.555**	-.746**	.629**	.526**
.312**		.616**	.581**	-.604**	.607**	.698**
	.312**	.225	.473**	-.261*	.385**	.518**
.399**	.590**	.531**	.483**	-.566**	.713**	.697**
.349**	.713**	.496**	.523**	-.453**	.642**	.662**
.154	.724**	.411**	.427**	-.412**	.493**	.553*
.363**	.617**	.641**	.602**	-.615**	.523**	.524**
.199	.262*	.179	.404**	-.175	.485**	.350**
.284*	.536**	.428**	.481**	-.549**	.404**	.461**
.103	.447**	.361**	.502**	-.356**	.400**	.334**
.217	.316**	.490**	.521**	-.533**	.361**	.295*
.402**	.590**	.627**	.548**	-.513**	.541**	.591**
.359**	.316**	.389**	.395**	-.433**	.381**	.434**
.192	.436**	.528**	.605**	-.599**	.418**	.373**
.372**	.551**	.694**	.630**	-.633**	.565**	.451**
.274*	.773**	.597**	.520**	-.517**	.597**	.622**
.221	.273*	.246*	.362**	-.350**	.177	.240*
.358**	.284*	.394**	.401**	-.386**	.211	.306*
.259*	.155	.233	.382**	-.228	.159	.122
.035	.201	.153	.013	-.134	.048	.075
.202	.276*	.404**	.501**	-.384**	.221	.185
.262*	.420**	.433**	.545**	-.438**	.339**	.366**
.261*	.496**	.483**	.539**	-.505**	.371**	.414**
.179	.332**	.411**	.417**	-.381**	.295*	.295*
.272*	.414**	.515**	.520**	-.467**	.324**	.311*
.138	.468**	.349**	.409**	-.236	.507**	.398**
.207	.312**	.451**	.483**	-.363**	.303**	.245*
.181	.366**	.371**	.376**	-.274*	.346**	.312*
A T T	S Y M	O A T	S A T	D E F	S A M	De cisi on

*correlation is significant at the 0.05 level, ** correlation is significant at the 0.01 level

Appendix J
Multiple Regression Analyses

Table J 1.

Hierarchical multiple regression analysis using pre-admission alcohol usage, treatment status, and peer relationship score to predict change in alcohol usage from pre- to post-admission

	B(SE)	β	<i>t</i> -test	<i>df</i>	<i>p</i>
Block 1					
POSIT E (peer relations)	-.008(.064)	-.010	-.118	67	.906
Pre-admission Alcohol Use frequency	.790(.086)	.793	9.236***	67	.001
Block 2					
POSIT E (peer relations)	.002(.066)	.002	.027	67	.979
Pre-admission Alcohol Use frequency	.795(.086)	.798	9.196***	67	.001
Substance Use Treatment Status	-.183(.326)	-.046	-.559	67	.578

Note: N = 68.

B = Unstandardized beta coefficients; SE = Standard error; β = Standardized beta coefficients; *df* = degree of freedom; and *p* = significant level.

*** *p* < .001

Table J 2.

Model summary for hierarchical multiple regression analysis using pre-admission alcohol usage, treatment status, and peer relationship score to predict change in alcohol usage from pre- to post admission

Model	R	R ²	Adjusted R ²	Std. Error of the Estimate	R ² Change	F
1	.788 ^a	.621	.610	1.09099	.621	F(2,65) = 53.313***
2	.789 ^b	.623	.605	1.09680	.002	F(1,64) = .313

Note: N=68

^a Predictors: (Constant), Frequency of alcohol use before YFPS admission, POSIT_E_RAW. ^b Predictors: (Constant), Frequency of alcohol use before YFPS admission, POSIT_E_RAW, if substance use treatment received/attended or not.

*** p < .001

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig
1	Regression	126.913	2	63.456	53.313	.000 ^b
	Residual	77.367	65	1.190		
	Total	204.279	67			
2	Regression	127.289	3	42.430	35.271	.000 ^c
	Residual	76.990	64	1.203		
	Total	204.279	67			
^a Dependent Variable: Change_Alc_usage						
^b Predictors: (Constant), Frequency of alcohol use before YFPS admission, POSIT_E_RAW						
^c Predictors: (Constant), Frequency of alcohol use before YFPS admission, POSIT_E_RAW, if substance use treatment is received/attended or not						

Table J 3.

Hierarchical multiple regression analysis using pre-admission drug usage, treatment status, and peer relationship score to predict change in drug usage from pre to post-admission

	B(SE)	β	t-test	df	p
Block 1					
POSIT E (peer relations)	-.114(.121)	-.123	-.949	.67	.346
Pre-admission Drug Use frequency	.475(.126)	.490	3.778***	67	.001
Block 2					
POSIT E (peer relations)	-.122(.126)	-.132	-.974	67	.334
Pre-admission Drug Use frequency	.473(.127)	.488	3.726***	67	.001
Substance Use Treatment Status	.146(.594)	.029	.246	67	.806

Note: N = 68.

B = Unstandardized beta coefficients; SE = Standard error; β = Standardized beta coefficients; *df* = degree of freedom; and *p* = significant level.

*** *p* < .001

Table J 4.

Model summary for hierarchical multiple regression analysis using pre-admission drug usage, treatment status, and peer relationship score to predict change in drug usage from pre- to post admission

Model	R	R ²	Adjusted R ²	Std. Error of the Estimate	R ² Change	F
1	.440	.194	.169	1.98702	.194	F(2,65) = 7.801***
2	.441	.194	.157	2.00154	.001	F(1,64) = .061

Note: N=68

^a Predictors: (Constant), Frequency of drug use before YFPS admission, POSIT_E_RAW. ^b

Predictors: (Constant), Frequency of drug use before YFPS admission, POSIT_E_RAW, if substance use treatment received/attended or not.

*** *p* < .001

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig
1	Regression	61.598	2	30.799	7.801	.001 ^b
	Residual	256.637	65	3.948		
	Total	318.235	67			
2	Regression	61.841	3	20.614	5.145	.003 ^c
	Residual	256.394	64	4.006		
	Total	318.235	67			
^a Dependent Variable: Change_Drug_usage						
^b Predictors: (Constant), Frequency of drug use before YFPS admission, POSIT_E_RAW						
^c Predictors: (Constant), Frequency of drug use before YFPS admission, POSIT_E_RAW, if substance use treatment is received/attended or not						