

6-1-2012

Evaluating the Effectiveness of the YASP Intervention: Adolescent Substance Use Outcomes

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LOMA LINDA UNIVERSITY
School of Science and Technology
in conjunction with the
Faculty of Graduate Studies

Evaluating the Effectiveness of the YASP Intervention: Adolescent
Substance Use Outcomes

by

Whitney Nicole Brown

A Thesis submitted in partial satisfaction of
the requirements for the degree
Master of Arts in General Psychology

June 2012

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Each person whose signature appears below certifies that this thesis in his/her opinion is adequate, in scope and quality, as a thesis for the degree Master of Arts.

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ACKNOWLEDGEMENTS

I would like to express my deepest gratitude to Dr. Ellen D’Errico who supported me every step of the way in completing this thesis. Dr. D’Errico you have been the ultimate definition of a mentor, believing in my vision for this study and encouraging me as a researcher every step of the way. I would also like to extend my thanks to Dr. Jason Owen for providing guidance in this endeavor and connecting me with such an excellent and fitting research opportunity. Additionally, I would like to thank Dr. Hector Betancourt for serving on my committee and providing direction. I would like to give a huge thanks to Mr. Ray Lozano for your dedication to YASP, allowing me to be a part of the evaluation of this program and for your help in the data collection process.

To my mother, sister, brother-in-law, nephew, niece and David, for their tremendous love and support during this undertaking. Thank you for always showing interest in the research I was doing and encouraging me to pursue my dreams. I would also like to give a special thanks to my two dear friends Danessa and Octaviana, for all your kind and supporting words while I was completing this thesis (and the helpful feedback along the way).

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ABBREVIATIONS

YASP	Youth Alternative Solutions Program
SU	Substance Use
SES	Socioeconomic Status
ED	Emergency Department
OE	Outcome Expectancies

ABSTRACT OF THE THESIS

Evaluating the Effectiveness of the YASP Intervention: Adolescent Substance Use Outcomes

by

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Master of Arts, Graduate Program in Psychology
Loma Linda University, June 2012
Dr. Jason Owen, Chairperson

Issues of alcohol and drug use are more pronounced during adolescence than at any other period of the life span. There is currently a need for research focusing on evaluating developmentally appropriate interventions for adolescents at risk for substance use issues. The present study seeks to evaluate the effectiveness of YASP (Youth Alternative Solutions Program), a hospital-based intervention program at Loma Linda University Medical Center. It is hypothesized that participation in YASP will decrease levels of substance use, change substance use outcome expectancies, decrease negative consequences resulting from substance use and increase participants sense of self-efficacy. A sample 27 adolescents was recruited from several YASP cohorts from August 2010 until October 2011 for this study. Twenty-seven total participants completed both time 1 (pre-test) and time 2 (post-test) questionnaires and only 14 of these participants completed all 3 waves of data collection (pre-test, post-test, and follow-up). Participants were administered pre-test, post-test, and 3 month follow-up questionnaires. Results indicated that a significant increase in negative alcohol outcome expectancies occurred between the three study time points. Given the high predictive value of alcohol expectancies in determining drinking behaviors this was an important finding in

determining the effectiveness of this intervention. More comprehensive studies of the YASP program should be conducted in the future to determine the utility of hospital-based, educational substance use interventions and to provide evidence of the long-term effects of this program.

CHAPTER ONE

INTRODUCTION AND LITERATURE REVIEW

Alcohol and drug misuse is a widespread issue that spans across genders, races, countries as well as age groups (Latimer, Winters, Stinchfield, & Traver, 2000; Leslie, 2008). Of interest to various disciplines is that issues of alcohol and drug use are more pronounced during adolescence than at any other period of the life-span (Windle, et al., 2008), possibly due to the various developmental changes that occur during the period of adolescence which increase the risk for alcohol/substance use (Husler, Werlen, & Rehm, 2005). As a result, adolescent substance use (SU) has the potential to escalate into more severe substance dependence disorders, which is cause for concern. Substance dependence is a serious health problem in terms of both physical and mental well-being. SU disorders are categorized on Axis I of the DSM-IV-TR clinical disorders and have been associated with other pervasive mental health disorders including depression, suicidality and other behavioral problems (Barkin, Smith, & DuRant, 2002; Bonomo & Proimos, 2005). This suggests that alcohol and drug abuse may be an indicator of other problems or a precursor to more serious psychological issues, especially given the vulnerable nature of youth during this developmental period.

Other consequences that may arise from SU include health and emotional problems, lower social competence and academic difficulties (Diego, Field, & Sanders, 2003) which can significantly impact quality of life and future health and success. It has been suggested that when assessing SU issues among adolescents a threshold of abuse occurs with early use, use in inappropriate settings and when negative consequences result from use (Monti, Colby, & O'Leary, 2002). These factors can be especially

important in identifying, assessing and treating SU problems among adolescents. Moreover, numerous statistical reports suggest that this threshold of abuse is a common occurrence among the adolescent population, establishing adolescent substance use as a prominent public health concern. According to a recent report by the National Center on Addiction & Substance Abuse at Columbia University (CASA, 2011), adolescent substance use represents a public health concern of epic proportions and is incomparable to other risky health behaviors. This report indicates that 75.6% of high school students in the United States have used an addictive substance and 46.1% of U.S. high school students are currently users. Of those high school students who have ever smoked, drank or used other drugs 19.4% have a clinical substance use disorder. The immediate consequences of substance use among this population include injury, pregnancy, depression, anxiety, psychosis, academic impairment, criminal activity and death. These consequences highlight the immense public health impact of adolescent SU given the prevalence of this issue and the additional consequences to non-users which include being the victim of assault or being injured (i.e. drunk driving accident) by an adolescent under the influence of a substance and being the child of a drug using teen mother. Furthermore, underage drinking alone is associated with an annual cost of approximately 68 billion dollars, while an annual cost 14.4 billion dollars is associated with substance-related juvenile justice programs (as a result of engagement in criminal activity related to substance use). The evidence clearly shows that adolescent substance use is a prevalent issue resulting in a number of public health and social welfare concerns that needs to be addressed in order to establish healthy and successful futures for youth in the United States and around the world.

Trends in Adolescent Substance Use and Associated Consequences

According to the National Survey on Drug Use and Health (SAMHSA, 2007) three-fourths of twelfth graders, over two-thirds of tenth graders and approximately two-fifths of eighth graders have consumed alcohol over their lifetime. Rates of past 30-day use are 45% for 12th graders, 34% for 10th graders and 17% for 8th graders. Additionally, adolescent's quantity of use is greater than that of adults with adolescents consuming on average 5 drinks, 6 times per month compared to adults who on average consume 2-3 drinks, 9 times per month. Early onset of SU is also related to more severe substance use issues during adulthood. Initiation of drinking before the age of 15 puts adolescents at 4 times greater risk of developing alcohol dependence in their lifetime as compared to those who abstain from drinking until age 21 or later (Spath, Greenberg, & Turrisi, 2008). Specifically, among youth in San Bernardino County 2.8% of adolescents aged 12-17 reported engaging in binge drinking in that past month, 57.5% reported drinking alcohol in the past month and 7% reported using marijuana in the past year and at least once in the past month (CHIS, 2005, & 2007). Furthermore, using data from 1996-2000 an increase was noted in the number of hospital discharges for SU among adolescents (Rowland & Atkins, 2007).

According to Brown et al. (2008) adolescents, when compared to adults, are increasingly vulnerable to the effects of SU on both biological and social functioning. Drug and alcohol use among this population has been shown to be associated with a number of risky behaviors including: unplanned sexual activity, early sexual initiation, unprotected sexual intercourse, drunk driving, riding in vehicles with other drunk drivers, not wearing a seat belt, violent/aggressive behaviors, being the victim of assault (both

physical and sexual with an estimated 1/3 to 2/3 of sexual assaults and rapes among this group being attributed to alcohol use), poor academic achievement, legal troubles, various self-injurious behaviors, including suicide and cutting, as well as increased risk of all types of injuries including pedestrian injuries, bicycle injuries, falls, burns and drowning (Barkin, et al., 2002; Leslie, 2008; Linakis, Chun, Meloo, & Baird, 2009; Windle, et al., 2008). Marijuana and alcohol use has also been associated with cognitive impairment, memory difficulties, increased risk of psychosis, and social and legal difficulties (Bonomo & Proimos, 2005). Moreover, one of the gravest consequences of alcohol use among adolescents is fatal car crashes at all blood alcohol levels. Among car crashes that involve individuals 15-20 years old, 29% of those who died had been drinking alcohol. A blood alcohol level of .05-.09 causes the risk of fatal car crashes to be 11 times more likely (Lewis, Thombs, & Olds, 2005). Ninety-five percent of morbidity and mortality rates among this age group are also due to substance misuse of all types (Becker & Curry, 2008; Bonomo & Proimos, 2005; Nygaard, Waiters, Grube, & Keefe, 2003; Spoth, et al., 2008).

The two most prevalent substances used and abused among the adolescent population are alcohol and marijuana, which are often used concurrently increasing the effects of each substance on the adolescent user (Deas, 2008). In a study by Shillington and Clapp (2003) all adolescents who reported marijuana use also used alcohol in the same 30 day period suggesting that concurrent use of both substances is a prevalent issue. Additional consequences of combined alcohol and marijuana use can include: becoming ill, driving under the influence, passing out and memory loss. However, it should be

noted that in the case of impaired driving some research suggests that there are no additive effects of combined alcohol and marijuana use (Liguori, Gatto, & Jarrett, 2002).

The Neurobiological Basis of Adolescent Substance Use

In order to comprehensively understand adolescent SU, the biological mechanisms that underlie their propensity for use and the consequences they may endure because of use should be addressed. Goldberg, Halpern-Felsher and Millstein (2002) suggest that this level of increased risk taking and immaturity in decision-making is due to neurological developments that occur during this life stage. These developments cause pronounced changes in neurocognitive functioning, increases in high-valence emotional events and rule violating behavior. All of these changes increase the risk for SU because adolescents may be more disinhibited and therefore more prone to partake in high risk behaviors (such as heavy episodic drinking, drunk driving, etc.) and unable to weigh long term consequences against more immediate and salient benefits/rewards of SU.

During adolescence the brain undergoes a number of alterations that may play a role in their propensity for substance use. These alterations include changes in the prefrontal cortex and mesolimbic regions of the forebrain which are known to modulate the reinforcing effects of various substances (Spear, 2000). Since the adolescent brain is still undergoing continued development including synaptic pruning and frontal lobe myelination which are responsible for decision making, inhibitory processing and impulse control (Tapert et al., 2007), they may be unable to make appropriate and well reasoned decisions regarding SU. Another important point to consider in understanding the role of biology in adolescents propensity for use is that many of the aforementioned

areas responsible for motivated behavior function remarkably different in the adolescent as opposed to the adult brain (Spear, 2000). This may partially explain why substance use involvement is so heightened during this time in the lifespan.

Furthermore, adolescents respond to SU in a biologically dissimilar manner compared to adults, which may have an impact on their decision to use alcohol or other substances. The adolescent brain is relatively insensitive to intoxicating effects of SU, which can lead to a greater quantity of consumption at any given time point; however, adolescents also have a greater sensitivity to substance related effects on both their development and behavior (Windle, et al., 2008). Adolescents require more alcohol to achieve the same effects adults obtain from lower levels of consumption (Spear, 2000). This may inadvertently lead to binge drinking which is known to result in a host of negative consequences. The increased level of consumption needed to obtain desired consequences releases dopamine which stimulates the reward system in the human brain. This subsequently leads to a desire for more positive stimulation. Alcohol then serves as a reinforcing mechanism for positive feelings; however this can lead to more powerful effects and behavioral responses (Tapert, Caldwell, & Burke, 2005) and may eventually manifest itself as alcohol abuse and dependence. These effects can include dangerous patterns of behavior such as ongoing SU despite physical/mental impairments and may be due to a lack of development in the prefrontal cortex which is responsible for decision making leading to impulsivity and risk taking (Alfonso & Dunn, 2007; Leslie, 2008). According to a report by the National Institute on Alcohol Abuse and Alcoholism (NIAAA; 2006), adolescents may also be sensitive to positive alcohol effects such as

relaxation and more comfort in social settings which can promote future and continued use.

Although the biology of the brain may in and of itself promote the use of harmful substances, use of these substances also substantially effects these same areas and can result in long term changes in brain functioning. Specific areas of the brain that may be altered by the effects of alcohol as well as other substances include: smaller hippocampal volume; a positive relationship between age of onset and amygdala size; changes in the cerebellum and cortex; reduced white matter in the corpus callosum; increased activation of the parietal area and dorsolateral prefrontal area (from marijuana use) (Tapert et al., 2005; Tapert et al., 2007). Alterations in these areas can be directly linked to a number of cognitive, neuropsychological and behavioral process impairments that can have dire impacts on an adolescent's ability to function adequately. For example, Lewis et al. (2005) noted effects that both alcohol and marijuana had on cognitive functions. Alcohol has the capacity to compromise an adolescent's ability to quickly react to sudden changes in conditions at moderate to high doses. Similarly, marijuana intoxication causes attention deficits in important dual task situations such as tracking vehicles and keeping appropriate distance between the vehicle the individual is operating and other cars. Additionally, it has been found that alcohol also effects attention and even after abstaining from use, prior users still performed worse on attention tasks compared to non-users (Tapert et al., 2005). It is clear that these impairments can be especially detrimental in the operation of a motor vehicle and validate concerns about adolescents driving under the influence.

Cognition and Adolescent Substance Use

It is also important to understand the role that cognition plays in promoting SU among adolescents. Implicit cognition has been found to predict alcohol and marijuana use given that memory associations are established and strengthened through repetitive experiences with SU. This in turn causes adolescents to respond to ambiguous cues with more drug related responses (Ames, Sussman, Dent, & Stacy, 2005). Due to the cognitive processes implicit in the human brain, when adolescents have positive SU experiences this will promote subsequent use and may lead to abuse of such substances and a motivation to continue use.

Another deficit that has been shown to occur as a result of substance use among adolescents is memory. It has been found that binge drinking produces long term changes in memory function (NIAAA, 2004) and marijuana use has similarly been shown to cause more cognitive errors in memory tasks including intrusions and repetition errors (Tapert et al., 2007). These memory impairments may be of considerable alarm in young people who should be fully engaged in school where memory is a vital asset for supporting successful outcomes which in turn promotes long term achievement well beyond adolescence.

Other Impairments and Ailments Resulting from Substance Use

Various other impairments in motor development and executive functioning have also been noted. In one study P300 waves were examined in brains of young adult drinkers. It was found that the P300 wave, which appears 300 milliseconds after a stimulus appears and serves as a measure of information processing, took longer to

appear in heavier versus lighter drinkers (Tapert et al., 2005). Other behavioral changes that may be expressed as a result of altered brain chemistry can include exacerbation of symptoms of depression and anxiety, amotivational syndrome, missing class and partaking in activities that one regretted later (McGuinness, 2009; Shillington, & Clapp, 2003).

Many of these biological, psychological and behavioral responses can be common, however they are not universal and can be moderated by a number of factors including genetics, gender, age of onset, duration of abstinence and preexisting brain abnormalities. However, these physiological responses still serve as markers of potential consequences that can result from SU. For example, chronic marijuana use has been found to be a risk factor for psychosis in genetically predisposed adolescents given the higher density of cannabinoid receptors in the brains of people with Schizophrenia (McGuinness, 2009). Since most individuals are unaware if they are genetically predisposed for psychosis or any other physiological effects of SU, abstinence or decreased use can greatly reduce the risk of such effects occurring.

Although a great deal of focus is placed on the effects SU has on the brain, there is an equally detrimental impact that SU has on other body systems. Alcohol use disorders in adolescents have been found to contribute to higher levels of enzymes that indicate liver damage, and reduce levels of growth hormones (Clark, Lynch, Donovan, & Block, 2001; Frias, Torres, Rodriguez, Ruiz, & Ortega, 2000). Other evidence has indicated decreased bone density among male adolescents who consume high levels of alcohol (Elgan, Dykes, & Samsioe, 2002). Additionally, marijuana use may result in blood pressure variability, decreased immune functioning, reduced sperm count, irregular

ovulation, and higher rates of cardiac arrhythmias (McGuinness, 2009). There is also speculation that marijuana use may promote development of lung cancer (Alfonso & Dunn, 2007).

Interventions for Adolescent Substance Use

Data from the National Survey on Drug Use and Health shows that there is currently a need for services to both prevent and treat alcohol and other behavioral problems (NIAAA, 2004). It has been found that more than half of those who enter some form of treatment or receive help for substance related issues do not complete these programs or finish without having made significant progress (Becker & Curry, 2008). These failures in program outcomes highlight the need for research to improve the effectiveness of programs that are available to adolescents at risk of substance use problems. Measuring changes in behaviors due to treatment has been difficult to accomplish due to a lack of evidence-based studies on the effectiveness of various types of interventions available to youth in the United States (Morral, McCaffrey, & Ridgeway, 2004). Moreover, the scientific evaluation of programs aimed at adolescents has only begun to surface in the last 15 years. National institutions such as the NIAAA have begun to initiate research that focuses on creating developmentally appropriate interventions for adolescents, because prior to this time adult programs were simply altered to fit this younger population (Lowman, 2004) which may have resulted in the dissemination ineffective programs given that the unique needs of adolescents likely were not addressed in these interventions.

Of the approximate 1 million or more adolescents in need of alcohol and other related SU services, only 11% of this population receives treatment (D'Amico et al., 2006). This may signal a need for more effective programs that can appropriately reach this population. Among the few programs for adolescents that have actually been studied, a majority tend to focus on severe alcohol and drug dependency issues rather than the less severe cases (NIAAA, 2004). Consequently, a critical gap exists in programs that target mild to moderate substance abuse issues (Ellickson et al., 2005) which are an important point of intervention given that at this level of drug and/or alcohol involvement, an opportunity exists to address issues of SU progression before it escalates into more severe substance abuse.

Evaluating program effectiveness is not a straightforward task given the complexity and nature of the various programs available to adolescents. However, by identifying how evidence-based effectiveness has previously been measured may serve as a guide for other programs striving for effectiveness. The Office of Juvenile Justice and Delinquency Prevention (OJJDP) has developed a *Model Programs Guide* available on their website (ojjdp.ncjrs.gov) that lists scientifically tested and proven programs that address a wide range of issues in juvenile justice including alcohol/drug therapy/education. Those programs listed as effective and exemplary typically employ a randomized, control group comparison, pre-post design method that includes follow-up data collection consisting of self-report surveys and questionnaires.

Several of these programs such as *The Community Trials Intervention to Reduce High-Risk Drinking* and *The Alcohol Misuse Prevention Study* list poor refusal skills and favorable attitudes towards use as risk factors and list self-efficacy and healthy beliefs as

protective factors. Hill (2008) also provides several suggestions for developing effective evidence-based interventions. Programs need to focus on individual level variables, given that programs aimed at reducing substance availability (i.e. social ordinances) have limited utility given that substances will always be available in society. At the individual level programs may find it beneficial to implement a group format which is most preferred by adolescents and is most developmentally appropriate due to the interaction with peers, feedback and discussion that this format provides (D'Amico et al., 2006). Programs that have been found to be most effective employ social influence models that focus on risk and protective factors, perceived norms, peer pressure, beliefs about consequences, peer or family use, role playing opportunities and plans for high risk situations.

Throughout the literature several factors are cited as essential components in intervention programs and include: (a) enhancing decision making skills (higher level thinking), (b) targeting consequences related to substance use and (c) developing competencies related to substance use (i.e. self-efficacy and expectancies) (Musher-Eizenman, Holub, & Arnett, 2003; Carpenter & Howard, 2009; Lowman, 2004; NIAAA, 2004; Tevyaw & Monti, 2004). It is also important to acknowledge that in secondary prevention for at-risk youth, success is not defined in terms of abstinence or no-drug use outcomes but as any decrease in a high risk behavior and associated harm, because for adolescents with less severe SU issues harm-reduction is the most appropriate approach (Tevyaw & Monti). This fact needs to be recognized when evaluating the degree to which a program meets standards of effectiveness.

Additionally, other factors such as a non-judgmental approach to treatment and not solely relying on knowledge as a source of change are mentioned as important components of intervention programs in much of the research. In an intervention setting a challenge may exist when attempting to provide adolescents with knowledge about the consequences of SU and when trying to promote behavioral change. This may be due to the fact that adolescents can be unreceptive to knowledge presented to them in a judgmental and lecturing format, which may be their experience in school, with parents or other authority figures (Tevyaw & Monti, 2004). Consequently, a nonjudgmental approach in which adolescents are not lectured to or told how to behave offers program instructors a better opportunity to appropriately connect with this population by conveying empathy, caring, understanding and warmth and this promotes self-directed change (Tevyaw & Monti). This approach results in the development of a quality relationship between the adolescent and instructor(s) and allows adolescents to feel safe disclosing information. This type of relationship promotes more positive change, because the instructor is able to present the adolescent with the likely consequences of their behavior without coming across as reprimanding (Bonomo & Proimos, 2005).

When targeting areas of change that may be essential in the intervention process (i.e. expectancies, consequences from use) prior research suggests that knowledge alone should not be the sole basis of any program. Hopkins et al. (2007) indicate that research in this area has failed to produce significant outcomes for programs that only rely on information dissemination. Further, support for this finding is provided by Musher-Eizenman et al. (2003) noting that information about the negative effects of substances was a weak predictor in preventing future substance use. Furthermore, knowledge alone

has been found to have an inadequate lasting effect on drug use and may have the opposite effect in awakening heightened curiosity (Kibel & Holder, 1994). These findings suggest that a combination of knowledge and other factors that promote actual behavioral change (i.e. increasing self-efficacy skills and incorporating interactive activities) is the optimal approach in prevention/intervention programs.

There are few systematic reviews available addressing adolescent substance use intervention, resulting in a lack of universal standards for what equates an effective intervention with sustainable long-term outcomes. Among those reviews that have been published there is no consensus in regards to length of interventions, number of sessions that should be included, the type of training that facilitators should receive or the exact content that should be covered in order to produce effective outcomes. In a review of 25 long term adolescent tobacco and other drug use interventions (Skara & Sussman, 2003) programs varied widely in these components ranging from 2 weeks to 8 years, with anywhere from 5 to 384 sessions and training ranging from none to 3 weeks (120 hours), with some programs completing training prior to program implementation and others including booster/follow-up training throughout the course of the program. Of the programs included in this review 19 were social influence oriented, 10 included peer leaders, 7 included video, film and audiotape lessons, 6 included a public commitment component, 5 included factual information about short and long term effects of substance use, 2 included life skills training and 1 included a computer administered component. However a majority of the programs reported significant program effects for long term substance use outcomes suggesting that there may not be a universal formula for developing effective intervention/prevention programs.

Predictors of Adolescent Substance Use

The high prevalence of SU among adolescents combined with the high rates of adverse consequences directly resulting from SU present a definitive need for effective evidence-based intervention (and prevention) programs to deal with this issue. In order to develop these types of programs, causes and influences of these behaviors must be understood to cultivate effective programs (Komro & Toomey, 2002) that address these various influences.

When addressing the area of program planning and evaluation for adolescent SU some mention of the motivation and predictors of SU should be discussed. Stress has been cited as an important predictor of SU because various substances may be employed as a coping mechanism and may be related to a biological stress response. According to Spear (2000) adolescence may be marked by increases in stress and anxiety and the increase in stress hormones interacts with the mesocorticolimbic brain regions to facilitate alcohol use. Above and beyond stress the greatest predictors of SU are social influences. Academic performance and school engagement have consistently been found to protect adolescents against SU involvement (Diego et al., 2003; Bryant, Schulenberg, O'Malley, Bachman, & Johnston, 2003; Ellickson & Hays, 1992). Peer pressure to use drugs, offers of drugs in school, norms set by parents regarding alcohol use and parental management of adolescent behavior are also predictors of initiating alcohol use (Kosterman, Hawkins, Guo, Catalano, & Abbot, 2000; Fowler et al., 2007; Ellickson & Hays, 1992). Targeting these social influences may also show utility in the program development process and assessing the impacts of these mechanisms once adolescents have completed an intervention program may answer vital questions about whether or not

programs are effectively targeting predictors and influences of SU behaviors among this population.

It is important to take note of the demographic correlates of adolescent substance use because although these variables are not easily amenable to change they provide a more comprehensive understanding of groups that may be at greatest risk for SU problems. This is valuable information to have for the development as well as dissemination of effective intervention programs. Identifying at risk populations allows programs to target groups most in need of services and to adapt programs to fit these groups' unique needs. Moreover, by identifying mechanisms behind both risk and protective factors program developers and facilitators are provided with opportunities to develop and enhance protective factors and employ strategies to decrease the impact of risk factors in an effort to reduce, eliminate and/or avoid problematic SU behaviors among the adolescent population. Common demographic factors that have been found to correlate with substance use behaviors include race/ethnicity, SES/parental education, age, gender, family structure and religiosity/religious affiliation.

Overall, research shows that Caucasian adolescents have significantly higher substance use rates (including alcohol and illicit drug use) compared to minority adolescents (Wills, Yaeger, & Sandy, 2003; Vakalahi, 2002; Shillington & Clapp, 2003). More specifically, African-American adolescents consistently have been shown to have among the lowest rates of substance use (Wills, McNamara & Vaccaro, 1995; Wills et al., 2003). Although trends in SU behavior are fairly well established for Caucasian and African-American racial groups, inconsistencies in rates of Hispanic adolescent SU have been generated and little if any research on SU rates for other adolescent racial groups are

available. In terms of Hispanic adolescent SU behaviors a number of studies have indicated that Hispanic adolescents engage in SU rates comparable to their African-American peers even after accounting for all other confounding variables (Vakalahi; Wills et al., 1995), while others suggests that they engage in intermediate levels of SU compared to their white peers (higher levels) and African-American peers (lowest levels; Wills et al., 2003). Yet, other studies have found that Hispanic adolescents report more SU compared to both White and African-American adolescents (Wang, Simons-Morton, Farhart & Luk, 2009).

Although minority adolescents overall tend to engage in SU rates lower than that of Caucasian adolescents this finding may be unexpected and contrary to media portrayals of minority youth. This may also be explained by the fact that Hispanic and African-American adolescents are far more likely to be referred to treatment programs through the criminal justice system than Caucasian adolescents (Shillington & Clapp, 2003). Furthermore, not only is the referral source for adolescent substance use cause for concern, but it is also important to take note of the precipitating factors that draw minority adolescents into SU behavior. Minority adolescents cite discrimination, racism and self-doubt as factors which contribute to their decision to engage in SU. Additionally, they also report less paternal and maternal knowledge, indicative of less paternal monitoring, which may lead to more engagement in delinquent behavior. However, minority adolescents also report having fewer substance abusing peers compared to white adolescents which may serve as a protective factor (Vakalahi, 2002; Wang et al., 2009). These findings are important for intervention programs for several reasons. For one, these findings suggest that SU problems may be more pronounced among Caucasian youth

who may not typically be targeted for intervention services. Secondly, these findings may highlight the fact that minority adolescents have less access to treatment services and may not seek treatment until they have contact with the legal system resulting from their SU behaviors. Thirdly, the precipitating factors for minority adolescent SU may be the result of poor coping mechanisms which can be targeted in effective intervention programs.

Race appears to be an important predictor of an adolescents level of involvement in SU behaviors and may serve as an important determinant of groups most in need of intervention services and variables that can be targeted in intervention programs, however it is also important to note the effect that race/ethnicity may have on treatment outcomes. Overall, race/ethnicity has been found to not predict outcomes, but some studies have noted higher program completion rates among White compared to minority adolescents (Latimer et al., 2000) which may be important in program planning and implementation.

In addition to race/ethnicity, some evidence has been provided suggesting that differences in SU behaviors can be seen across genders and age groups. As with most risk behavior involvement, female adolescents report less drug and alcohol use compared to male adolescents (Smylie, Medaglia, & Maticka-Tyndale, 2006; Shillington & Clapp, 2003). Rates of SU have also consistently been found to correlate with age. Older adolescents tend to engage in both higher overall rates of SU and more problematic alcohol misuse compared to younger adolescents (Wang et al., 2009; Barnes, Welte, Hoffman & Dintcheff, 2005) which includes binge drinking, drinking and driving, etc. Older adolescents may be more inclined to engage in SU because as they age parental knowledge (both maternal and paternal) tends to decrease, allowing adolescents more

freedom to engage in problematic behaviors without consequence from parents. It may simply be that parents are unaware of their adolescent's behavior allowing this problem behavior to persist without intervening. Moreover, older adolescents report associating with substance using peers more often than younger adolescents, likely increasing the impact of peer pressure and fueling the need to "fit in." This may be cause for concern given that patterns of other risk behaviors tend to decrease with age, while the increasing use of substances with age is a pattern that persists into adulthood (Barnes et al.) which has a number of implications for adult functioning. When developing interventions to address adolescent substance use, patterns of use based on age and gender should be taken into account. Specifically, interventions may benefit from targeting early SU behaviors before these behaviors escalate into more serious misuse.

In terms of treatment outcomes, although it may be important to target early SU, age has not been shown to have an impact on treatment outcomes indicating that interventions can be equally beneficial for all age groups. However, in terms of gender males have been found to have poorer post-treatment outcomes compared to females, with males being more likely to use alcohol at follow-up time points (Latimer et al., 2000). This latter finding suggests that monitoring program outcomes is important, especially among male participants, in order to identify reasons why males may be more inclined to return to baseline SU rates. Furthermore, targeting competencies that are necessary to maintain abstinence and/or safer practices also serves as an important intervention point for this at-risk population.

Socioeconomic status and parental education level can typically be considered to go hand and hand and parental education can often take the place of an SES indicator in

determining adolescent SU involvement. SES and parental education are a complex set of factors that influence many aspects of an adolescent's life and as a result affect SU behaviors. In general, higher rates of SU have been found for adolescents from low SES and lower education families due to the fact that these children typically experience more stressful life events (a robust predictor of SU involvement) and higher levels of other risk factors in combination with lower levels of protective factors (Wills et al., 2003; Wills et al., 1995). The effects of low parental education and low SES on higher adolescent SU may occur through lower levels of parental support, higher levels of negative life events, less behavioral competence, lower academic competence and affiliation with more substance using peers. Furthermore, the economic stress on low SES parents may result in more negative behaviors toward their children, being less attentive to their children and possibly more authoritarian parenting which lead to higher SU rates (Wills et al., 1995).

Although being lower on the SES and parental education spectrum appears to have an inverse relationship with SU this relationship has not been clearly established. For example, even though low SES families are more vulnerable to the impact of risk factors they accrue greater benefits from protective factors than higher SES adolescents (Wills et al., 1995). This may be especially important in the intervention setting where the focus can be on decreasing risk factors and increasing protective factors in order to prevent problematic SU behaviors from occurring. Moreover, other research has noted that when parental education is high (as opposed to low) SU levels among adolescents are also high (Vakalahi, 2002). Such findings may be explained by a confluence of factors including greater access to illicit drugs.

Overall, research supports the need for SU intervention programs in low SES communities where risk factors may be high and protective factors may be low. Research shows that urban, low-income, minority youth (who may be in need of intervention services) often grow up in communities where the environmental and social factors present promote risk-taking and can heavily influence their attitudes as well as behaviors (Berg, Coman, & Schensul, 2009). Families in low SES communities may not have access to treatment for their substance using children and parents in these communities may have fewer tools available to them to deal with these situations.

The structure of an adolescent's family (e.g., intact, single parent, etc) is a common predictor of risk behavior involvement of all types including SU. A consistent finding in the literature is that adolescents from non-intact (i.e. blended and single parent) homes/families have higher SU rates compared to adolescents from intact, two-parent homes (Wills et al., 2003; Wang et al., 2009). However, there are some mixed findings in this area as well. Other research studies have only noted differences in SU between two-parent versus father-stepmother and other family structures (Wang et al.). Ultimately what can be speculated from a majority of these findings is that stressful life events such as divorce may be the contributing factor to increased rates of SU among adolescents from non-intact homes.

Although a major focus is often placed on risk factors for adolescent substance use it is important for intervention programs to tap into protective factors as well. One of the commonly cited protective factors for adolescent substance use is religion. Several studies have shown that religiosity is inversely related to adolescent substance use with those individuals who come from a very religious home reporting lower levels of

substance use compared to those who do not come from a religious home (Wills et al., 2003). In particular, adolescents from more proscriptive religions such as LDS, SDA, Baptist and Born Again Christians have been shown to be the most protective against substance use. However, the highest rates of adolescent substance use have consistently been found among those with no religious preference (Merrill, Folsom, & Christopherson, 2005). It has further been noted that adolescent's perceptions of their parent's level of religiosity as compared to their own is more predictive of lower levels of substance use. Religion has been shown to impact parenting style; specifically parental monitoring which in turn predicts adolescent substance use with adolescents who are more closely monitored exhibiting lower levels of substance use. As can be seen here, religion serves more as a buffer against substance use rather than as a direct predictor of substance use. Furthermore, religion has also been shown to impact values and attitudes which may moderate the impact of negative life events on substance use (Wills et al., 2003). Stressors/negative life events have consistently been shown to impact adolescent's well being (Stewart & Bollard, 2002) and given the effect that religion may have on how an adolescent may respond to difficulties this may determine whether or not they turn to substance use as a coping mechanism.

Beyond those demographic predictors mentioned here other individual level factors have also been noted to significantly predict adolescent involvement in drug and alcohol use. According the recent CASA report (2011) these predictors include a genetic predisposition to substance abuse, traumatic childhood events (i.e. abuse), co-occurring mental health issues and peer victimization as well as engagement in other risk behaviors including early/unsafe sexual activity and violent behaviors. These various predictors

may serve as an important focus of intervention program content and/or target behaviors of change. Unlike many of the demographic correlates of substance use, several of these predictors are amenable to change and may serve as an additional focus of intervention programs. The aforementioned risk factors may also be a significant source of distress for adolescents which may cause them to seek out alcohol or drugs as a coping mechanism and may in this case be a primary issue that needs to be addressed (i.e. referring adolescents to therapy) before addressing substance use attitudes, beliefs etc.

Current Need for Evidence Based Programs in Community Settings

One of the apparent gaps in the prevention/intervention research is the lack of empirical evidence for the effectiveness of widely used programs and long-term follow up findings to determine if positive changes in behavior are sustained over time (Hopkins, et al., 2007; Spoth et al., 2008). Few of the programs currently in use have been rigorously evaluated and of those that have been, few have been evaluated by researchers who have not been involved in the development of the program posing the risk of confounding interests in the results reported.

The National Registry of Evidence-based Programs and Practices (NREPP) is an online, searchable registry of over 210 interventions for mental health promotion, substance abuse prevention and substance abuse treatment, which rates the quality of research supporting intervention outcomes. Among this list non-residential programs aimed at an age range of 6-17 years old are almost exclusively offered in a school setting with a handful offering services in other community settings. Furthermore, other nationally recognized programs such as *Keepin' it Real*, *Project STAR*, and *Project*

Northland, are all implemented in the school-setting, highlighting the unique need for research on programs offered outside of the school setting. Additionally, Skara and Sussman (2003) noted that all but one of the interventions included in their review of long adolescent substance use programs was school based. Of those programs identified as being effective interventions outside of the classroom setting, brief interventions employing motivational interviewing in the Emergency Department (ED) are cited (Burke, O'Sullivan & Vaughan, 2005). These programs are often used for screening and help adolescents recognize the potential consequences of their substance use. These interventions are considered reachable-teachable moments and aim at decreasing high risk behavior, reducing consumption or modifying patterns of use (Tait, Hulse, Robertson & Sprivulis, 2005). Analyses show that those involved in an ED based brief intervention had a reduction in ED presentations at 12 month follow-up and effectively engaged adolescents with treatment services. This suggests that these interventions are an initial step in the intervention process, but are not in and of themselves sufficient enough to tackle the multitude of factors in adolescent substance use. Furthermore, these types of interventions may only reach adolescents heavily involved in substance use rather than the mild to moderate users. These above findings highlight the need for more comprehensive interventions outside of the school setting and given that there have only been a few evaluations of community based prevention programs (CASA, 2011), this is an area of adolescent substance use prevention in need of further investigation. Given the success of hospital based brief interventions, this may suggest that the hospital setting provides a unique, alternative educational arena for delivering more comprehensive adolescent substance use interventions. However, a review of the literature on drug and

alcohol use interventions shows that there is a lack of hospital-based community interventions targeting health related risk behaviors such as SU. The opportunity to provide real-life examples of the adverse consequences associated with SU is available in hospital trauma departments and other units which can highly impact SU attitudes and behaviors over and above other school and community-based programs which may only increase knowledge (Dearing, Caston & Babin, 1991).

Theoretical Framework

Outcome Expectancies

OE are defined as beliefs about or confidence in the probability of outcomes that result from a certain behavior and typically involve beliefs about both costs and benefits of using substances (Musher-Eizenman et al., 2003; Stacy, 1997) and have also been termed impelling or inhibiting forces (Epler, Sher, & Piasecki, 2009). When an individual has more positive expectancies about using a substance, this can drive SU because these beliefs support the idea that substances will result in beneficial outcomes such as assertiveness, confidence, enjoying an experience, being sociable, forgetting problems and enhancement of sexual functioning/experiences (Barnow, et al., 2004).

OE are an inherent part of the decision making process and greatly influence the cost-benefit analysis in adolescents' decisions to abstain from or develop a propensity toward use (Epler, et al., 2009). According to Goldberg, et al. (2002) awareness of risk associated with SU alone is not enough to sway an adolescent towards abstaining from use because perceived benefits may play an equal if not greater role in the decision making process. In fact, when a strong association between a positive outcome and a

particular behavior exists and that outcome is desired (i.e. relaxation, fun etc) a cue in memory serves to associate the behavior (drinking or using another substance) with the desired outcome. This results in a greater likelihood that the behavior will become readily associated with a particular result/consequence (Stacy, 1997). According to Bandura (1977) adolescents are able to cognitively represent future consequences associated with a particular behavior and this serves as a source of motivation for using substances. Previous research indicates that for every 10% increase in risk expectancies from drinking, the likelihood of actually drinking decreases by 16% and the same 10% increase in benefit expectancies from drinking results in a 16% increase in the likelihood of actually drinking (Goldberg, et al., 2002).

OE function as guides for behavior during the acquisition of SU behaviors, because as behaviors are maintained they become more automatic and the cost-benefit analysis is less often employed (Musher-Eizenman, et al., 2003). This suggests that interventions focused on changing outcome expectancies should focus on those at risk or just beginning to experiment with drug use, not those adolescents who already have severe substance abuse issues. Other research also holds that drinking expectancies among the adolescent population has high predictive value in determining drinking behavior at 2 year follow-up points, while other research indicates even greater predictive value at 9 year follow-up (Windle, et al., 2008).

According to Windle et al. (2008) “Alcohol expectancies have been associated consistently with earlier onset of alcohol use (e.g., frequency and quantity), and prospective transitions to increased levels of alcohol use” (p. 13). Given the effect of OE, prevention/intervention efforts may place expectancy change at the forefront of their

efforts. Unlike other possible predictors of adolescents use (i.e. family history, gender, etc) OE are malleable in children/adolescents and can result in actual changes in drinking behaviors (Alfonso & Dunn, 2007). According to Skenderian, Siegel, Crano, Alvaro and Lac (2008) expectancies can be altered if an outcome from substance use is found to be more or less positive than what was previously thought, making the behavior less desirable (which is the goal here). However, they also caution that expectancies can change in the opposite direction. They found that once adolescents use marijuana, negative outcomes that they were told would occur may not actually take place therefore, intentions to use this substance in the future may increase. This suggests that indirect experience as a mechanism of change may not be as effective as once thought and therefore the focus of interventions should be on convincing adolescents that positive expectancies may not be as great as expected rather than simply stressing harms and negative outcomes.

Self-Efficacy Theory

Various theoretical models have been cited as underlying adolescents' propensity towards SU. These models demonstrate the mechanisms by which behavioral change can be achieved in order to promote more healthy behaviors among this group. A prominent theoretical model in the research on SU and addictions is Self-Efficacy Theory. Originally developed by Bandura (1977), this model of self-efficacy is defined as an individual's perception of their capability to perform in a way that allows them to influence events that affect their life by determining how they feel, think, behave and motivate themselves. More relevant to this context, self-efficacy provides the mechanism

by which people can be confident in their ability to abstain from SU (Burlison & Kaminer, 2005). Some researchers have extended this model of self-efficacy to specifically focus on resistance self-efficacy, which is a person's ability to resist offers or opportunities for SU (Carpenter & Howard, 2009).

It has been found that those higher in self-efficacy are more likely to reduce drinking frequency and therefore self-efficacy serves as a protective factor against SU among those who may be greatly at risk for such behaviors (Burlison & Kaminer, 2005; Carvajal, Evans, Nash, & Getz, 2002). Given the relative importance of self-efficacy in the behavior change process, this construct serves as an ideal focus in prevention/intervention programs for adolescents. If programs have the ability to enhance self-efficacy among youth they may be more successful in changing behaviors above and beyond solely providing knowledge to alter expectancies (Barkin, et al., 2002; Musher-Eizenman, et al., 2003). It is suggested that satisfaction with accomplishments and feeling that one's behavior has been less than what is desired is an impetus for change (Bandura, 1977). Therefore, teaching goal-setting in interventions can be an important component in the change process. Moreover, self-efficacy provides an adolescent with an important sense of competence that equips them with the skills necessary to abstain from SU. It has been found that adolescents that lack refusal skills are more likely to partake in SU and the condition is likely to persist (Scheier, Botvin, Diaz, & Griffin, 1999). Bandura (1977) summarized the importance of self-efficacy during adolescence noting that during this period of marked independence the opportunity for experimentation presents itself but it should not be considered alarmingly abnormal, while other research even suggests that adolescents will mature out of SU (Tevyaw & Monti, 2004). However, the pivotal factors

here are whether adolescents follow a normative path of SU experimentation/social use and decide to forego high risk activities or if they follow a problematic path of development and heavily immerse themselves in these types of behaviors (Bandura, 1994; Lowman, 2004). These important decisions are ultimately determined by a combination of competencies, efficacy and individual factors.

The Current Study

The current study seeks to evaluate the effectiveness of the Youth Alternative Solutions Program (YASP), a hospital-based outreach education intervention developed by the Trauma Support Services Center of Loma Linda University and Medical Center in San Bernardino County, California. The YASP program was devised as a response to SU problems detected by healthcare professionals working in the emergency room at Loma Linda University Medical Center (LLUMC), a level I adult and pediatric trauma center (provides the highest level of surgical care available to trauma patients, with a mandatory number of surgeons, emergency room physicians and anesthesiologists on duty 24/7, as well as providing a program of research and being a leader in trauma education and injury prevention). The program operates in conjunction with the county's juvenile court system which refers adolescents, who have committed a criminal, traffic or civil offense that involved alcohol or marijuana, to the program. The program also accepts participants who have been referred by their school or by parents as a result of concerns around the adolescent's involvement in drug and/or alcohol use. The program falls under the classification of a secondary prevention, which is a program that is implemented during the early stages of SU, in order to stop the progression of this behavior and restore health,

normalcy and stability to the individual exhibiting the problem behavior (Husler et al., 2005). This prevention can also be considered an indicated level prevention (as opposed to a universal or selected) because it specifically targets those who are at high risk for SU. In this particular intervention risk is assessed by those who are transitioning into substance use and who have suffered potentially adverse consequences from this behavior, such as drunk driving, getting arrested or low school performance. This intervention also seeks to create change at the individual level by disseminating knowledge and challenging beliefs as well as developing skills to better resist substance use (NIAAA, 2004). The focus of this program is to increase adolescent's self-efficacy, change expectancies about SU and teach better drug/alcohol decision making.

YASP is offered in a unique hospital environment with a vast array of resources to educate adolescents about the real life consequences of substance use. Additionally, in this setting the program is able to target those most in need of services rather than providing mass dissemination of information like in many school based programs. School based curricula is often delivered by teachers or authority figures that students are likely to discount or be unable to relate to diminishing the effect of the information provided, while YASP provides a non-judgmental approach delivered by a credible adult with expertise in this field.

An initial study conducted on YASP (Lynsky et al., 1999) noted decreases in intent to use both alcohol and marijuana from pre-test to post-test evaluations. However, little change from pre to post-program was observed in participant's perceptions about the harm of both alcohol and marijuana. Additionally, qualitative data was collected through evaluative essays completed by participants. These comments indicated that the

program had a positive influence on the participants, and this data has provided a basis for understanding the mechanisms by which effective attributes of the program occurred. This prior work on evaluating YASP has failed to provide statistical evidence about the effectiveness (or lack thereof) of the program. Prior work indicated that one of the greatest limitations of the evaluation was that it did not provide a scientific basis for measuring program success.

In scientific research on intervention programs there is currently a call for evidence-based effectiveness studies. Although, YASP has been implemented for over a decade there has failed to be any studies done that appropriately document the effectiveness of the program through statistical means. In an effort to determine the utility of this program, to identify both the effective and ineffective components of the current intervention and to establish whether revisions/improvements in the program curriculum or delivery should be made to improve the effectiveness of YASP, the current study is warranted. The program includes various educational components (in the form of information dissemination, interactive/hands on components, workshops and self-reflective activities) which focus on building self-efficacy skills to promote coping and goal setting and decision making skills regarding drugs and alcohol as well as developing a more comprehensive understanding of consequences of drug and alcohol use. However, these various constructs were previously untapped by prior evaluation tools and therefore this study seeks to provide a more comprehensive evaluation that will assess various constructs related to adolescent substance use. Furthermore, the literature shows that there is a lack of hospital based educational intervention programs, such as this one, providing a unique opportunity to test the effectiveness of this type of program.

The literature supports the prevalence of adolescent SU which currently is a primary health concern given the consequences of such early use. Furthermore, a move towards evidence-based treatments and interventions requires that programs being implemented to address these behaviors are thoroughly investigated and exhibit scientifically supported evidence of their effectiveness. Given the pervasiveness of this issue, this study seeks to evaluate a long standing SU intervention program in San Bernardino County. By conducting this study we hope to find evidence of the effectiveness of this intervention and to provide data that will allow improvements to be made to the program that will promote long term positive outcomes for the adolescent population.

Research Plan

The primary goal of the proposed study is to determine if the YASP (Youth Alternative Solutions Program) intervention has sustainable effectiveness in reducing substance use behaviors and associated consequences among at risk adolescents. The mechanisms that may underlie these changes, including marijuana and alcohol outcome expectancies and self-efficacy, will also be assessed. Furthermore, demographic correlates of adolescent substance use will also be assessed to determine that these changes are a result of actual intervention components rather than individual level factors. Findings from the proposed study will help to determine if funding should continue to be provided to the Loma Linda Trauma Services Center to carry out this intervention program. If the program is effective in this goal then it can be more widely applied (branch out into other counties, etc.). If it fails to meet these criteria steps can

then be taken to improve the methods employed in the program to produce more significant results/outcomes. Findings from this study will also be the first step in determining if this program meets the criteria to be an effective evidence-based intervention. Additionally, these findings will provide support for the effectiveness of an intervention in a unique, hospital based setting which can support further development of programs of this type. To accomplish these goals four specific aims and hypotheses are proposed.

Aims and Hypotheses

Aim 1. To evaluate the effects of the YASP intervention on participants levels of alcohol and marijuana use.

Hypothesis 1: A decrease in participant's frequency and quantity of substance use will be observed across the three time points of the intervention.

Aim 2. To evaluate the effects of the YASP intervention on participant's alcohol and marijuana outcome expectancies (OE).

Hypothesis 2a: A decrease in positive alcohol OE will be observed across the three time points of the intervention.

Hypothesis 2b: An increase in negative alcohol OE will be observed across the three time points of the intervention.

Hypothesis 2c: A decrease in positive marijuana OE will be observed across the three time points of the intervention.

Hypothesis 2d: An increase in negative marijuana OE will be observed across the three time points of the intervention.

Aim 3. To evaluate the effects of the YASP intervention on the number of adverse substance use consequences participants experience.

Hypothesis 3: A decrease in adverse consequences resulting from alcohol and marijuana use will be observed across the three time points of the intervention.

Aim 4. To evaluate the effects of YASP on participants sense of self-efficacy to refuse substance use.

Hypothesis 4: An increase in participant's sense of self-efficacy will be observed across the three time points of the intervention.

CHAPTER TWO

METHODS

Participants

A sample of 27 adolescents was recruited from several YASP cohorts from August 2010 until October 2011 for this study. The total number of participants who completed baseline questionnaires was 40 adolescents, however only participants who provided at least baseline and post-test data were included in the analyses. Twenty-seven total participants completed both time 1 (pre-test) and time 2 (post-test) questionnaires and only 14 of these participants completed all 3 waves of data collection (pre-test, post-test, and follow-up). Of this total sample 19 males and 8 females participated in this study. Participants ranged in age from 13 – 18 years of age at time 1 data collection, with a mean age of 16.7 years of age. The race/ethnicity of the participants consisted of 3.7% American Indian/Native American, 7.4% Black/African-American, 44.4% Hispanic/Latino/a, 7.4% Asian/Pacific Islander, 29.6% White/Caucasian, 3.7% Bi/Multiracial, and 3.7% Other. 3.7% of participants were in Middle School, 70.4% were in High School, 11.1% were High School graduates, 3.7% completed a GED, 7.4% were attending a Junior College and 3.7% were attending a 4-year University. 77.8% of participants were referred to the YASP intervention by Court/Probation, 7.4% were referred by school, 7.4% were referred by parents and 7.4% were referred by another source (See Table 1 for additional demographic data).

Table 1
YASP Participant Demographics

Variable	<i>N</i>	%
Age (M, ± SD)	16.7	1.33
Gender		
Male	19	70.4
Female	8	29.6
Race/Ethnicity		
American Indian/Native American	1	3.7
Black/African-American	2	7.4
Hispanic/Latino/a	12	44.4
Asian/Pacific Islander	2	7.4
White/Caucasian	8	29.6
Bi/Multiracial	1	3.7
Other	1	3.7
Education Level		
Middle School (6 th , 7 th , 8 th)	1	3.7
High School (9 th , 10 th , 11 th , 12 th)	19	70.4
High School Graduate	3	11.1
GED/High School Equivalent	1	3.7
Junior College	2	7.4
4 Year College/University	1	3.7
Parental Education		
Less than High School	3	11.1
High School	5	18.5
Some College	7	25.9
2-Year College Degree (Associates)	4	14.8
4-Year College Degree (BA/BS)	2	7.4
Master's Degree	2	7.4
Doctoral/Other Professional Degree	1	3.7
Referral Source		
Court/Probation	21	77.8
School	2	7.4
Parent(s)	2	7.4
Other	2	7.4
Living Situation		
With Parents	24	88.9
With Other Relatives	1	3.7
Dorm/Student Housing	1	3.7
Other	1	3.7
Religious Affiliation		
Protestant Christian	7	25.9
Catholic	8	29.6
Evangelical	1	3.7
Muslim	1	3.7
No Preference/No Religious Affiliation	6	22.1

YASP Intervention

Participants spent on average 6-8 weeks actively participating in the YASP intervention. All components of the program were delivered by a single program facilitator employed by the Trauma Support Services Center at Loma Linda University Medical Center and Children's Hospital (LLUMC). Additional program staff including researchers, interns and Loma Linda University student volunteers participated in various aspects of the program delivery under the direction of the program facilitator. Participation in the current study did not positively or negatively impact participation in the actual intervention. The program consisted of 7 distinct components delivered over the course of 8 separate weekly sessions. Parents/guardians of the participants were encouraged to attend these sessions with their child if they wished to do so, but parental participation was not required.

Program Orientation

All participants were required to attend a program orientation meeting prior to beginning the actual intervention component of the program. This meeting was held in a classroom on the Loma Linda University campus and lasted for approximately 2 hours. During the meeting participants were provided with a detailed overview of all components of the program, specific guidelines for each session and expectations. Participants and their parent/guardian were required to sign all necessary paperwork at this time. Each participant and their parent/guardian had a brief one-on-one meeting with the program facilitator at the end of the meeting to answer questions, clarify financial

arrangements, schedule an individual entrance interview and provide parents/guardians with an at home drug test to use at their personal discretion.

Entrance Interview

Each participant scheduled an individual entrance interview the week following the orientation meeting. This interview was held at the Trauma Support Services office and lasted approximately 45 minutes to 1 hour. At the entrance interview the participants met one-on-one with the program facilitator in order to review the client's needs and appropriateness of their participation in the program (i.e. is the client's problem severity beyond the scope of the program). The facilitator also administered a baseline drug test at this time.

Workshops

Participants were required to attend 2 separate workshops held at the Loma Linda University campus. Each of these workshops lasted for approximately 2 hours. The workshops included various educational components such as discussions (including a chance to defend marijuana use), films, group activities/games and guest speakers (including doctors of LLUMC, individuals whose lives have been personally affected by substance use and former substance users/abusers). The workshops focused on educating participants on the effects of substance use/abuse, promoting positive behavioral choices and healthier coping skills.

Coroner's Visit

Participants were required to take a tour of the San Bernardino County Coroner's Office. The hour long visit consisted of a 30 minute power point presentation highlighting the harmful results of substance use and high risk behaviors and a 30 minute tour of the morgue area. No autopsies were shown in an effort to conceal identities; however corpses in body bags were shown. Following the tour a debriefing session was held by the coroner to help participants appropriately process what they had seen.

Trauma Center Visit

Participants were required to take a Friday or Saturday night visit of the LLUMC Trauma Center beginning at around 9 pm and ending around 12 midnight. This time was specifically chosen given that a high volume of cases involving drugs/alcohol typically present in the trauma center during these hours. The purpose of the visit was to expose participants to the inner workings of the hospital with an emphasis on injuries that occur related to drugs/alcohol, poor decision making and safety issues. Participants spent time in the emergency department, adult surgery/trauma/ICU units and pediatric ICU. Participants interacted with medical staff during the visit and were provided with information on career opportunities. Special activities were arranged to stress the importance of safety and the consequences of high risk behaviors.

12 Step Program

Participants were required to attend one Alcoholics Anonymous or Narcotics Anonymous meeting of their choice during a specified week. Participants were provided

with a list of meeting dates and times in the area. Participants were required to have a group leader/secretary sign their sign-off sheet to ensure that they attended the session.

Exit Interview

The final session was an exit interview conducted at the Trauma Support Services office. At this interview the participant met one-on-one with the program facilitator to review their file to ensure that all sessions were completed, all fees were paid and homework assignments were completed. Participants were required to turn in a completed sign-off sheet with all signatures indicating that all classes were completed and a 500-word essay was completed. The essay had to include an explanation of what the client learned from the program and their experience during the sessions, whether or not the sessions influenced them, and what they would do differently. During this session an opportunity also exists to provide referrals to various services many of the adolescent participants may need such as medical, dental, mental health, tattoo removal and volunteering opportunities. Upon completion of the program the participant was given a certificate that they could then present to the court, probation and school to verify their completion of the program.

Measures

The major assessment tool for this research was a self-report questionnaire assessing (a) involvement in substance use (frequency and quantity), (b) substance use outcome expectancies, (c) consequences associated with substance use, (d) self-efficacy and (e) social desirability as well as (f) a set of demographic questions and (g) questions

assessing participant's satisfaction with the program. All measures were obtained for use from the original authors (except those available in the public domain, not requiring authorization to use) with written permission via e-mail correspondence to use them for the purpose of this study. All scales have also been validated for use with the adolescent population.

Monitoring the Future Survey

Frequency and quantity of both alcohol and marijuana use were measured using a series of 7 questions asking about the number of times alcohol or drugs were used in the last 30-days and the amount used at any given time point in the past 30 days. These questions are modeled after questions used in the Monitoring the Future Survey which is available in the public domain. Sample questions include: "During the past 30 days, on average, about how many marijuana cigarettes or the equivalent did you smoke?" and "On how many occasions during the past 30 days have you had alcoholic beverages to drink? (This includes beer, wine, wine coolers and liquor)." Reliability statistics are unavailable for these items.

Marijuana Effects Expectancy Questionnaire

Marijuana use outcome expectancies were measured using the Marijuana Effects Expectancy Questionnaire-Brief (MEEQ-B; Torrealday, et al., 2008) which consists of 6 items measuring both positive and negative expectancies of marijuana use. Each of the 6 items corresponds to the original scales of the MEEQ (negative items measure cognitive and behavioral impairment, global negative effects, and craving and physical effects;

positive items measure relaxation and tension reduction, social and sexual facilitation, and perceptual and cognitive enhancement). Items are rated on a 5-point Likert scale ranging from 1 = *Disagree Strongly* to 5 = *Agree Strongly*, with a higher score indicating a higher expectancy of a particular effect. A sample question includes: “Marijuana helps a person relax and feel less tense (helps you unwind and feel calm).” Reliability studies have been done and indicate that Cronbach’s alpha (α) ranges from .42 to .60, average α = .50 for this scale. Scores on the MEEQ-B are calculated by summing the 3 items on the positive subscale and dividing by 3 and similarly summing the 3 items on the negative subscale and dividing by 3 to obtain average scores for each. Higher average scores on the positive subscale reflects more positive expectancies and higher average scores on the negative subscale reflects more negative expectancies.

Comprehensive Effects of Alcohol Scale

Alcohol use outcome expectancies were measured using the Comprehensive Effects of Alcohol Scale (CEOA; Fromme, Stroot, & Kaplan, 1993) which consists of 38 items measuring 4 aspects of positive expectancies (sociability, tension reduction, liquid courage and sexuality) and 3 aspects of negative expectancies (cognitive/behavioral impairment, risk & aggression and self-perception). Items in the scale are rated on a 4-point Likert scale ranging from 1=*Disagree* to 4=*Agree*. Sample questions include: “It would be easier to express my feelings,” “I would neglect my obligations,” “I would feel calm,” “I would take risks,” “I would feel unafraid,” “I would feel guilty,” and “I would feel sexy.” Reliability of each subscale is as follows: Sociability α = .84, Tension reduction α = .73, Liquid Courage α = .82, Sexuality α = .72, Cognitive/Behavioral

Impairment $\alpha = .89$, Risk & Aggression $\alpha = .76$ and Self-Perception $\alpha = .59$. Scores on the CEOA are calculated by summing all items on the positive subscale and dividing by the number of items and summing all the items on the negative subscale and dividing by the number of items to obtain an average score for the respondent for both positive and negative expectancies.

College Alcohol Problems Scale

Consequences associated with substance use were measured using the College Alcohol Problems Scale-revised (CAPS-r) (Maddock, Laforge, Rossi, & O'Hare, 2001) which consists of 8 items measuring social and personal consequences from drinking. Items in the scale are rated on a 6-point scale indicating the frequency of consequences ranging from 1 = *Never* to 6 = *10 or more times*. A sample question includes: "Engaged in unplanned sexual activity." Reliability statistics on the scale have been calculated with α ranging from .70 to .80. Although this scale only assesses consequences from alcohol use it was used as a general indicator of consequences resulting from SU. Scores on the CAPS-r are calculated by summing all items to create a composite score. A higher score indicates higher frequency of consequences from drinking.

General Self-Efficacy Scale

Self-efficacy was measured using a general measure of self-efficacy using the General Self-Efficacy Scale (GSE) (Schwarzer & Jerusalem, 1995). This scale was created to assess a general sense of perceived self-efficacy which can predict one's ability to cope with daily hassles and how to adapt after experiencing stressful life events. This

scale consists of 10 items answered on a 4-point scale from 1 = *Not true at all* to 4 = *Exactly true*. An additional 5 self-efficacy items were written under the recommendation of the GSE authors. These items are aimed at measuring a more domain specific area of self-efficacy—efficacy to abstain from the use of both alcohol and marijuana. Instructions for constructing these items were provided by Schwarzer and Fuchs (1996). These 5 items are included at the end of the original 10 self-efficacy items and are answered on the same 4-point scale from 1 = *Not true at all* to 4 = *Exactly true*. Reliability studies have been done and it has been found that the scale has a Cronbach's alpha ranging from .76 to .90. Scores on the GSE are calculated by adding up all items and dividing by the total number of items to obtain a mean/average score.

Marlowe-Crowne Social Desirability Scale

A social desirability scale was used to guard against bias in self-report data pertaining to SU behaviors. A short form of the Marlowe-Crowne Social Desirability Scale (1964) was used. The original scale was designed to identify sets of behaviors perceived to be exemplary but infrequently enacted. The scale consists of items that discriminate between individuals who do and do not tend to exhibit this bias towards social desirability. The scale consists of 8 items answered with a “Yes” or “No” response. 4 items reflect honest responses and the other 4 reflect socially desirable responses. Sample questions include: “Have there been occasions where you took advantage of someone?” and “Are you always courteous, even to people who are disagreeable?” Reliability studies have been conducted on this subset of items in several countries and it has been found that the scale has a Cronbach's alpha ranging from .65 to .77. This subset

of items has also been used in an adolescent SU related study by Carpenter and Howard (2009). Scores on the Marlowe-Crowne Social Desirability Scale are calculated by honest items receiving a 1 for a “yes” response and 3 for a “no” response, all other items receive a 3 for a “yes” response and 1 for a “no” response. Unanswered items receive a score of 2. A lower score indicates more honest responses reflecting less bias towards social desirability.

Data Collection Procedures

At the program orientation YASP participants were invited to participate in the study. At this time the purpose of the study and procedures were explained, contact information was obtained, and a study ID number was assigned to each participant. Adolescents who chose to participate in the study were required to sign a consent form (if the participant was younger than 18 years of age their parent was also required to sign the consent form). Participants (who consented) were asked to complete the study questionnaire (time 1) on-line via the Survey Monkey website (an encrypted account) using a computer provided by the program. This is the time at which baseline data was collected. Once the participants completed all components of the program (including workshop 1 & 2, trauma room visit, Coroner’s visit, AA meeting and exit interview) the questionnaire was administered again (time 2) to collect immediate post-program data. The questionnaire was again completed on-line via a computer provided by the program. Follow-up data was also collected three months after completing the program (time 3). Time 3 data collection was administered online via the participant’s personal home computer (or a computer that they had access to) or a hard copy of the questionnaire was

administered via U.S. mail if the participant did not have internet, e-mail or computer access. Time point reminder e-mails were sent to participants in order to solicit their participation in completing time 3 questionnaires. The participants were also contacted via telephone by the program facilitator and sent reminder cards in the mail to inform them when survey 3 was available for them to complete. The reminder e-mail provided a link to the online questionnaire and participants were required to follow the same procedure as in preceding data collections. Those participants without e-mail access received a hard copy of the questionnaire along with a letter containing the same information that was provided in the reminder email. A return postage paid envelope was provided to those completing a hard copy of the questionnaire.

At each data collection participants were prompted to enter their unique 4-digit ID number in order to proceed in completing the questionnaire. This ID number allowed the participants responses from each time point to be linked in order to analyze changes among the variables of interest from pre-program to post-program and follow-up time points.

Participants who completed the questionnaire at time 2 data collection received a \$2.00 Baskin Robins ice cream gift certificate for their continued participation in the study. Participants who completed time 3 data collection received a \$10.00 Best Buy gift card in the mail immediately after completing this questionnaire. Additionally, participants who completed time 1, 2, and 3 questionnaires had their names placed in a drawing for a \$100.00 gift card once the study was closed.

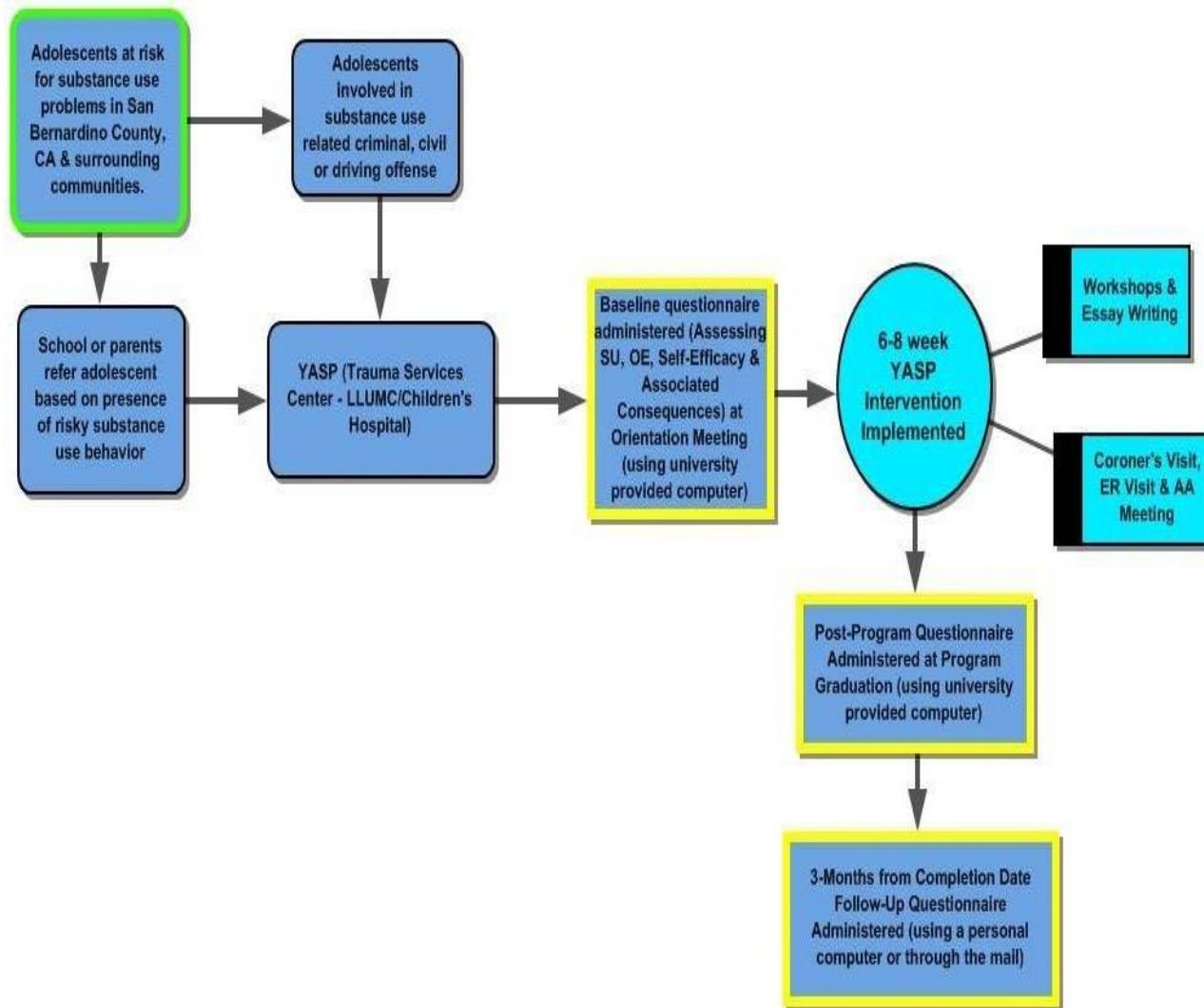


Figure 1. Diagram of Study Design

Data Analyses

Analyses were performed using SPSS 17.0 for Windows. Power analyses were conducted with GPower 3 (Erdfelder, Faul, & Buchner, 1996) evaluating the *a-priori* sample size required to detect a medium-sized effect ($f = .50$) for the repeated measures analysis of variance. Assuming an alpha level = .05 and autocorrelations between repeated measures $r = .10$, adequate power (.80) to achieve a medium effect ($f = .50$) would be achieved with a total sample of 21. Given the actual sample size of 14, observed power was not adequate to detect a medium-sized effect (power = .623) for the repeated measures analysis of the negative alcohol expectancies measure (Negative CEOA).

T-tests for independent samples were used to evaluate differences between participants who dropped out of the study early (those who completed the questionnaire at only time 1 and time 2 data collection) and participants who remained in the study for the full duration of the study period (those who completed all three waves of data collection) on all of the outcome variables of interest which included quantity/frequency of substance use, positive and negative alcohol outcome expectancies, positive and negative marijuana outcome expectancies, adverse consequences resulting from substance use and sense of self-efficacy. Scores on the variables of interest for the two groups were analyzed separately for time 1 and time 2 to check for significant mean differences between the two groups prior to the implementation of the intervention and immediately after the implementation of the intervention in order to determine if data from those who dropped out of the study altered the mean, thereby posing a threat to validity. For each of the t-tests run, the Levene's Test for Equality of Variances was

analyzed. When the Levene's Test for Equality of Variances was violated, equal variances were not assumed.

One-way repeated measures analyses of variance (RM-ANOVA) were used to evaluate differences in mean scores on quantity/frequency of substance use, positive and negative alcohol outcome expectancies, positive and negative marijuana outcome expectancies, adverse consequences resulting from substance use and sense of self-efficacy between the three time points included in the study period. Due to the small sample size demographic and social desirability covariates were not included in the analyses in an effort to maintain a higher level of power. When a significant RM-ANOVA was found post-hoc testing using the Least Significant Difference (LSD) test was used as a follow up analysis. Given the small sample size and low power the more conservative Bonferroni adjustment procedure was not used. Following a significant Omnibus F test, Pairwise Comparisons were analyzed to determine if there were significant mean differences between scores at any of three study time points. The sphericity assumption that the variances for each set of difference scores are equal was evaluated for each of the repeated measures ANOVA tests using the Mauchly's Test of Sphericity. When a significant value for the Mauchly's Test of Sphericity was found this indicated that there was a violation of the sphericity assumption and a Greenhouse-Geisser correction was used.

CHAPTER THREE

RESULTS

T-tests for independent samples were run to determine if there were differences between those participants who dropped out of the study early (only completed time 1 and 2 data) and those who completed all 3 waves of data collection on all of the outcome variables of interest (substance use frequency/quantity, alcohol outcome expectancies, marijuana outcome expectancies, consequences from substance use and general self-efficacy). No significant differences were found between the two groups on any of the outcome variables of interest at time 1 or time 2 (Table 2).

Table 2

Mean differences on outcome variables between full study (n = 14) and early dropout (n = 13 groups)

Variable	Time 1			Time 2		
	<i>t</i>	<i>p</i>	Mean Difference	<i>t</i>	<i>p</i>	Mean Difference
Frequency/Quantity of SU	-0.11	0.913	-0.04	-0.18	0.855	-0.06
Positive Marijuana OE	0.02	0.987	0.01	-1.59	0.125	-0.53
Negative Marijuana OE	-0.78	0.444	-0.24	-0.06	0.954	-0.02
Positive Alcohol OE	-1.4	0.174	-0.39	-1.19	0.246	-0.33
Negative Alcohol OE	-1.85	0.076	-0.43	-1.78	0.089	-0.43
Consequences from SU	-0.76	0.454	-0.26	-0.58	0.567	-0.15
General Self-Efficacy	0.86	0.400	0.18	1.06	0.299	0.19

Hypothesis 1

A one-way repeated measures ANOVA was performed to determine if there was a decrease in participant's quantity/frequency of substance use between time points.

Mauchly's test was not significant $\chi^2(2) = .68, p = .711$, so the assumption of sphericity was accepted. Results of the repeated measures ANOVA indicated that there was no significant difference in the quantity/frequency of participants substance use between the three time points $F(2, 26) = .42, p = .664$.

Hypothesis 2a-2d

A one-way repeated measures ANOVA was performed to determine if there was an increase in negative alcohol expectancies between time points. Mauchly's test was not significant $\chi^2(2) = .65, p = .723$, so the assumption of sphericity was accepted. Results of the repeated measures ANOVA indicated that there were significant differences in participant's negative alcohol expectancies between the three time points $F(2, 26) = 3.67, p = .039$. Post hoc testing using the LSD method indicated a significant increase in negative alcohol expectancies from time 1 to time 3, $p = .018$, but no significant differences were found from time 1 to time 2, $p = .059$ or time 2 to time 3, $p = .520$ (Table 3). Another repeated measures ANOVA was performed to determine if there was a decrease in positive alcohol expectancies between time points. Mauchly's test was not significant $\chi^2(2) = 1.54, p = .462$, so the assumption of sphericity was accepted. Results of the repeated measures ANOVA indicated that there were no significant differences in participant's positive alcohol expectancies between the three time points $F(2, 26) = .05, p = .954$.

A one-way repeated measures ANOVA was performed to determine if there was an increase in negative marijuana expectancies between time points. Mauchly's test was not significant $\chi^2(2) = 3.00, p = .223$, so the assumption of sphericity was accepted.

Results of the repeated measures ANOVA indicated that there were no significant differences in participants negative marijuana expectancies between the three time points $F(2, 26) = .98, p = .387$. Another repeated measures ANOVA was performed to determine if there was a decrease in positive marijuana expectancies between the time points. Mauchly's test indicated that the assumption of sphericity had been violated $\chi^2(2) = 8.20, p = .017$, so degrees of freedom were adjusted using the Greenhouse-Geisser correction. Results of the repeated measures ANOVA indicated that there were no significant differences in participant's positive marijuana expectancies between the three time points $F(1.34, 17.39) = .11, p = .816$.

Table 3

Pairwise comparisons for negative alcohol outcome expectancies

Comparison	Mean Difference	Std Error	95% CI
Time 1 vs. Time 2	-0.3	0.15	-.62, .01
Time 2 vs. Time 3	-0.12	0.18	-.01, .62
Time 3 vs. Time 1	0.42*	0.16	.08, .75

* Significant at $p < .05$

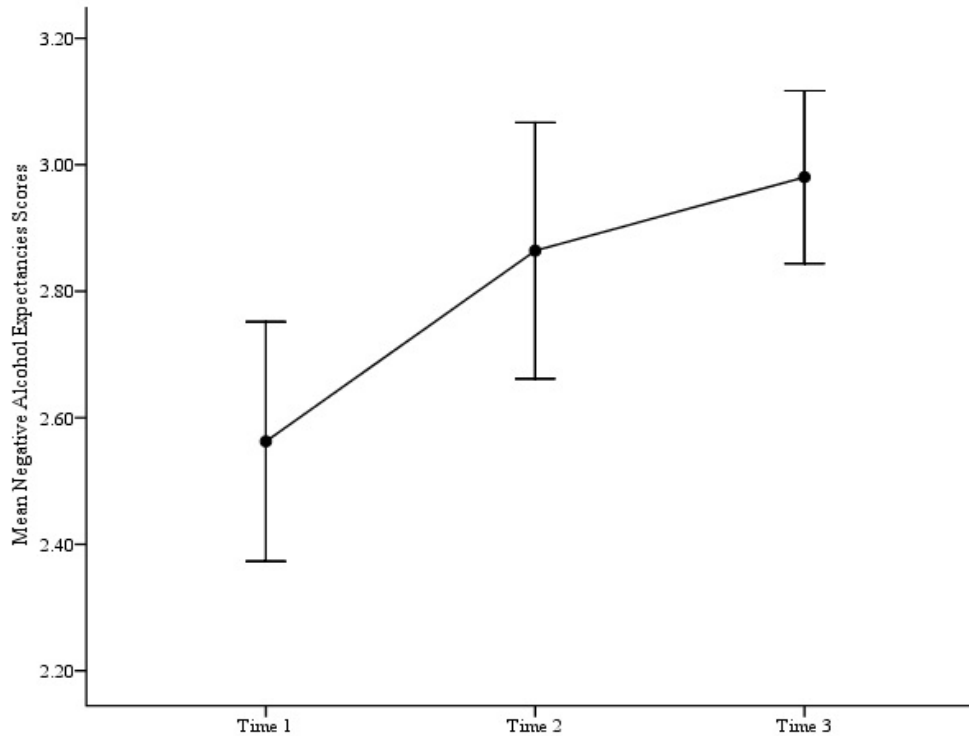


Figure 2. Means plot of negative alcohol outcome expectancies across time points.

Hypothesis 3

A one-way repeated measures ANOVA was performed to determine if there was a decrease in adverse consequences resulting from substance use between time points.

Mauchly's test indicated that the assumption of sphericity had been violated $\chi^2(2) =$

9.25, $p = .010$, so degrees of freedom were adjusted using the Greenhouse-Geisser

correction. Results of the repeated measures ANOVA indicated that there were no

significant differences in participant's adverse consequences resulting from substance use

between the three time points $F(1.28, 15.30) = .52, p = .525$.

Hypothesis 4

A final one-way repeated measures ANOVA was performed to determine if there was an increase in participant's sense of self-efficacy between time points. Mauchly's test was not significant $\chi^2(2) = .66, p = .720$, so the assumption of sphericity was accepted. Results of the repeated measures ANOVA indicated that there were no significant differences in participant's sense of self-efficacy between the three time points $F(2, 26) = .77, p = .473$ (See Table 4 for summary of mean scores for all outcome variables).

Table 4

*Participant's mean scores on outcome variables across time points (n = 14)**

Variable	Time 1		Time 2		Time 3	
	Mean (± SD)	95% CI	Mean (± SD)	95% CI	Mean (± SD)	95% CI
Quantity/ Frequency of SU	1.79 (1.11)	1.15, 2.43	1.52 (.86)	1.02, 2.02	1.57 (1.09)	.94, 2.20
Negative Alcohol OE	2.56 (.71)	2.15, 2.97	2.86 (.76)	2.43, 3.30	2.91 (.51)	2.69, 3.28
Positive Alcohol OE	2.89 (.79)	2.43, 3.34	2.93 (.71)	2.52, 3.34	2.93 (.82)	2.46, 3.41
Positive Marijuana OE	3.74 (1.04)	3.14, 4.34	3.74 (.71)	3.33, 4.15	3.81 (1.02)	3.22, 4.40
Negative Marijuana OE	3.55 (.64)	3.18, 3.91	3.74 (.79)	3.28, 4.19	3.86 (.77)	3.41, 4.30
Consequences from SU	1.84 (.96)	1.25, 2.42	1.64 (.79)	1.16, 2.11	1.52 (1.01)	.91, 2.12
General Self-Efficacy	3.31 (.56)	2.99, 3.64	3.36 (.55)	3.06, 3.66	3.44 (.43)	3.19, 3.69

*Note. n = 13 for Consequences from SU

CHAPTER FOUR

DISCUSSION

Findings of the Present Study

This study examined the effects of a unique hospital based substance use intervention on adolescent participant's involvement in substance using behaviors, alcohol and marijuana outcome expectancies, adverse consequences resulting from substance use and sense of self-efficacy. The Youth Alternative Solutions Program (YASP) has been in operation at Loma Linda University Hospital for over a decade and up until this time a comprehensive study analyzing the effects of the program on adolescent substance use behaviors and related constructs has not been conducted. The present study sought to provide preliminary data on the effectiveness of YASP in an effort to identify the utility of an early substance use intervention program in a non-school setting and potentially identify areas for program improvement.

Findings from this study indicate that negative alcohol expectancies are the only outcome variable that significantly differed between time points with the greatest increase in negative alcohol expectancies being exhibited from pre-test (time 1) to 3-months follow-up after completion of the intervention (time 3). Additionally, although not a statistically significant difference, there was a positive trend in negative marijuana expectancies between time points as well. These are important findings given that expectancies, which in this case was an increase in negative expectancies, are likely to motivate adolescents to abstain from substance use based on the negative cognitive representation of consequences (explicit cognitions) associated with substance use that they developed (Bandura, 1977), especially in the case of alcohol use, which inform the

decision making process (Stacy, 1997). Furthermore, previous research has found that changes in expectancies are predictive of changes in intentions to use substances (Skenderian et al., 2008) with expectancies ultimately determining actual substance using behavior years later (Windle et al., 2008).

Despite this finding the challenge becomes understanding why differences were not seen in positive substance use outcome expectancies. Previous research suggests that perceived benefits of substance use may potentially play a greater role in the decision to use substances than perceived risks associated with substance use (Goldberg et al., 2002). Future studies should focus on understanding the particular mechanisms within this intervention that influence both negative and positive outcome expectancies. For instance it may be that the components of the YASP intervention focused more on stressing the harms and negative outcomes of substance use rather than focusing on providing evidence that positive expectancies may not be as great as initially expected, which may have possibly explained the observed results.

Despite the lack of statistically significant changes in participant's substance use frequency/quantity and adverse consequences resulting from use trends in these measures between time points should be noted. A trend towards a decrease in adverse consequences was seen between all time points. This suggests that the YASP intervention may have some effectiveness in one of its primary goals—harm reduction. Given the extremely high level of morbidity and mortality among the adolescent age group resulting from substance use, primarily as a result of drunk driving, not to mention a host of other associated consequences including cognitive impairments and social, academic and legal difficulties, any level of reduction in such consequences may translate into program

success. Previous studies have suggested that harm-reduction is the most appropriate intervention approach for adolescents with less severe substance using behaviors (Tevyaw & Monti, 2004), as is the case with YASP participants. Moreover, the participants in this study did not exhibit a significant decrease in their quantity/frequency of substance use between study time points, however a small initial decrease was observed from time 1 to time 2, with rates remaining fairly stable at time 3. For any intervention, as with YASP, a primary goal is a reduction in the risk behavior of interest, however it should be noted that overall participants in this study exhibited relatively low levels of substance use involvement at all waves of data collection which may account for the absence of a significant reduction in substance use.

Limitations and Directions for Future Research

Although these results produced some significant findings, several limitations of this study should be addressed. First, the small sample size limited the power to detect a significant effect for many of the constructs that were measured. The power analysis indicated that a sample of at least 21 adolescents at all three time points would be necessary for sufficient power. Furthermore, According to Becker and Curry (2008) “treatment studies with an active comparison condition require at least 71 participants per group to have adequate power, while studies with a passive comparison condition require at least 27 participants per group.” Although this study did not contain an actual comparison group this recommendation suggests that 30 participants or more would be good for obtaining statistically powerful results. SAMHSA Prevention Enhancement Protocols similarly suggest that a rough guide for the minimum number of participants in

intervention studies is 30 participants. The aforementioned guidelines suggest that at least 30 study participants would be adequate for obtaining valid results. This is an important issue to address in future studies as a small sample size limits the generalizability of the results to the larger theoretical population. It is recommended that future studies analyzing the YASP intervention obtain a sample of 30 or more participants (depending on the study design) to ensure adequate power and to draw conclusions about the effectiveness of the program that will be generalizable to the larger adolescent population.

There was a lack of a control/comparison group in the present study which posed the issue of regression to the mean. By including a control group that does not receive a treatment it allows the study to control for changes that may occur over time that are not attributable to the treatment being administered and this allows the study to detect changes that are truly caused by the intervention at hand. Regression to the mean occurs when a particular group is tested that is likely to have extreme scores (very low or very high) and naturally scores in this group will go in the opposite direction regardless of the treatment administered. While regression to the mean was unlikely in the current study, given that the study participants exhibited only mild to moderate levels of substance use and their patterns of use had the potential to either increase or decrease as a function of the treatment, the lack of a control/comparison group limited the ability of the study to determine whether any of the changes observed were actually caused by the implementation of the intervention rather than some other factor such as maturation. Furthermore, programs found to be effective most often employ a randomized, control

group comparison suggesting that future studies should include either a control or comparison group to more clearly deduce the effects of the YASP intervention.

Attrition was a major limitation of the present study, as is the case with many repeated measures designs and which is even more problematic with the adolescent population (Perez, Ezpeleta & Domenech, 2007). Previous research suggests that adolescents who drop out (hard-to-reach/hard-to-retain) of substance use intervention studies tend to have an overall greater prevalence of substance use and poorer long term outcomes (Odierna & Schmidt, 2009; Snow, Teves & Arthur, 1992; Meyers, Webb, Frantz & Randall, 2002) which may be problematic when trying to assess the effectiveness that the intervention has on these very constructs. Differences between participants who dropped out of the study from baseline (time 1) to post-test (time 2) were not analyzed in the present study, however differences between participants who dropped out from post-test (time 2) to follow-up (time) were analyzed and although drop outs from post-test to follow-up did not appear to differ on any of the outcome variables of interest it did significantly decrease power in this study. Additionally, difficulties reaching/retaining participants limited the ability to obtain 1 year follow-up data. Unfortunately, previous studies have found that even with incentives, web-based questionnaires, repeated phone calls and mailings the success rate for retaining hard-to-reach participants is still low (Stephens, Thibodeaux, Sloboda & Tonkin, 2007), therefore future studies should establish both an effective and innovative plan for retaining participants in an effort to reduce the high rate of attrition observed in the present study. One option for this may be to connect with adolescent participants through a social

networking site or through text messaging, both of which adolescents tend to engage with on a more frequent basis and may result in higher response rates.

This study utilized only self-report data to measure changes in SU behaviors and related constructs. Given that SU is a socially undesirable behavior the potential for participants to provide more desirable responses that may misrepresent their actual behaviors was present. A social desirability measure was embedded into the questionnaire used for this measure, however due to low power scores on the Marlowe-Crowne Social Desirability measure were not entered into the analyses as a covariate. Future studies should analyze the potential effects of social desirability on participant's response. Additionally, future studies may benefit from providing additional objective measures of adolescent substance use involvement to guard against this potential bias.

Due to the small sample size in this study controlling for demographic covariates known to predict adolescent substance use behavior (e.g. race, religious preference) risked the possibility of further reducing power so a decision was made to not include these covariates in the analyses. However, future studies should analyze these covariates to determine if there is a particular subset of adolescents who may benefit the most from this program and to determine if the YASP program is effective above and beyond the influence of these demographic variables on substance use behaviors. Moreover, future studies would benefit from analyzing other common predictors of adolescent substance use such as stress and social influences (i.e. peer pressure, norms set by parents and sibling substance use) given the importance these factors play in the acquisition and maintenance of substance use behaviors (Spear, 2000; Kosterman et al., 2000; Fowler et

al., 2007; Ellickson & Hays, 1992). By analyzing these predictors researchers can determine the effect this program may have on counteracting these influences/factors.

An interesting construct that was not tapped into by any of the measures in the current study was perceptions of the program facilitator. Previous studies have found that a quality relationship between adolescent participants and the program facilitator leads to greater participant disclosure and more positive changes resulting from a non-judgmental approach to treatment (Bonomo & Proimos, 2005). It is hypothesized that the relationship that developed between the YASP participants and the program facilitator may be a primary contributor to overwhelmingly positive feedback (participant's were given the opportunity to provide brief comments in the last section of the questionnaire) participant's gave about the program. This relationship could potentially be the basis of any level of effectiveness that this program demonstrated. Furthermore, through this relationship with the program facilitator participants are connected with a relatable role model that may not be present in other areas of their life and who is able to connect them with volunteer and career development opportunities and a host of other resources that can potentially improve their well-being above and beyond the substance use related variables that were measured in this study. Future studies may benefit from analyzing the effects of this relationship on participant outcomes and widening the range of outcome variables to include measures of academic achievement, social competence and emotional well-being.

Implications

These findings suggest that the YASP intervention is effective in increasing negative alcohol outcome expectancies. This is an important finding given the high predictive value of drinking expectancies in determining long term alcohol use. By increasing negative alcohol expectancies the YASP program may potentially result in a decrease in the likelihood of actually drinking which is a primary goal of this intervention. Overall, participants in this study exhibited only mild-moderate levels of substance use behaviors which may suggest that adolescents being targeted for this program fall into the experimentation/social use group of substance users which is considered to be a normal developmental path (Bandura, 1994), which may explain why a greater effect was not found among many of the outcome variables of interest. YASP program developers might consider implementing this program with more problematic/severe substance using adolescents to determine if more significant effects may be seen with this group. Additionally, it could be that implementing this intervention with adolescents in the early stages of substance use experimentation halts the progression of this behavior rather than causing a significant immediate decrease in substance use, however more long term follow up analyses will be required to make this distinction.

Researchers should continue to study/evaluate the YASP intervention in order to further understand the utility of this type of intervention. To date only one other hospital-based program (of this type) has been documented in the literature (Dearing, Caston & Babin, 1991) suggesting a need to more extensively research interventions offered in this type of community-based setting. Additional and more comprehensive studies of the

YASP intervention will determine if this is an effective intervention format and provide evidence supporting a wider dissemination of this type of program in other communities.

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APPENDIX A
COLLEGE ALCOHOL PROBLEMS SCALE – REVISED
(CAPS-R)

Maddock, LaForge, Rossi, and O'Hare (2001)

Use the scale below to rate HOW OFTEN you have had any of the following problems over the past year as a result of drinking alcoholic beverages.

1. Feeling sad, blue, or depressed
(1) Never (2) Yes, but not in the past year (3) 1-2 times (4) 3-5 times
(5) 6-9 times (6) 10 or more times
2. Nervousness, irritability
(1) Never (2) Yes, but not in the past year (3) 1-2 times (4) 3-5 times
(5) 6-9 times (6) 10 or more times
3. Caused you to feel bad about yourself
(1) Never (2) Yes, but not in the past year (3) 1-2 times (4) 3-5 times
(5) 6-9 times (6) 10 or more times
4. Problems with appetite or sleeping
(1) Never (2) Yes, but not in the past year (3) 1-2 times (4) 3-5 times
(5) 6-9 times (6) 10 or more times
5. Engaged in unplanned sexual activity
(1) Never (2) Yes, but not in the past year (3) 1-2 times (4) 3-5 times
(5) 6-9 times (6) 10 or more times
6. Drove under the influence
(1) Never (2) Yes, but not in the past year (3) 1-2 times (4) 3-5 times

(5) 6-9 times (6) 10 or more times

7. Did not use protection when engaging in sex

(1) Never (2) Yes, but not in the past year (3) 1-2 times (4) 3-5 times

(5) 6-9 times (6) 10 or more times

8. Illegal activities associated with drug use

(1) Never (2) Yes, but not in the past year (3) 1-2 times (4) 3-5 times

(5) 6-9 times (6) 10 or more times

APPENDIX B

THE COMPREHENSIVE EFFECTS OF ALCOHOL

QUESTIONNAIRE (CEOA)

Fromme, Stroot, and Kaplan (1993)

This questionnaire assesses what you would expect to happen if you were under the influence of alcohol. Mark a response from (1) for disagree to (4) for agree, depending on whether or not you would expect the effect to happen to you if you were under the influence of alcohol. These effects will vary, depending upon the amount of alcohol you typically consume.

If I were under the influence of alcohol:

1. I would be outgoing
(1) Disagree (2) Slightly Agree (3) Slightly Agree (4) Agree
2. My senses would be dulled
(1) Disagree (2) Slightly Agree (3) Slightly Agree (4) Agree
3. I would be humorous
(1) Disagree (2) Slightly Agree (3) Slightly Agree (4) Agree
4. My problems would seem worse
(1) Disagree (2) Slightly Agree (3) Slightly Agree (4) Agree
5. It would be easier to express my feelings
(1) Disagree (2) Slightly Agree (3) Slightly Agree (4) Agree
6. My writing would be impaired
(1) Disagree (2) Slightly Agree (3) Slightly Agree (4) Agree
7. I would feel sexy
(1) Disagree (2) Slightly Agree (3) Slightly Agree (4) Agree
8. I would have difficulty thinking

(1) Disagree (2) Slightly Agree (3) Slightly Agree (4) Agree

9. I would neglect my obligations

(1) Disagree (2) Slightly Agree (3) Slightly Agree (4) Agree

10. I would be dominant

(1) Disagree (2) Slightly Agree (3) Slightly Agree (4) Agree

11. My head would feel fuzzy

(1) Disagree (2) Slightly Agree (3) Slightly Agree (4) Agree

12. I would enjoy sex more

(1) Disagree (2) Slightly Agree (3) Slightly Agree (4) Agree

13. I would feel dizzy

(1) Disagree (2) Slightly Agree (3) Slightly Agree (4) Agree

14. I would be friendly

(1) Disagree (2) Slightly Agree (3) Slightly Agree (4) Agree

15. I would be clumsy

(1) Disagree (2) Slightly Agree (3) Slightly Agree (4) Agree

16. It would be easier to act out my fantasies

(1) Disagree (2) Slightly Agree (3) Slightly Agree (4) Agree

17. I would be loud, boisterous, or noisy

(1) Disagree (2) Slightly Agree (3) Slightly Agree (4) Agree

18. I would feel peaceful

(1) Disagree (2) Slightly Agree (3) Slightly Agree (4) Agree

19. I would be brave and daring

(1) Disagree (2) Slightly Agree (3) Slightly Agree (4) Agree

20. I would feel unafraid

(1) Disagree (2) Slightly Agree (3) Slightly Agree (4) Agree
21. I would feel creative

(1) Disagree (2) Slightly Agree (3) Slightly Agree (4) Agree
22. I would be courageous

(1) Disagree (2) Slightly Agree (3) Slightly Agree (4) Agree
23. I would feel shaky or jittery the next day

(1) Disagree (2) Slightly Agree (3) Slightly Agree (4) Agree
24. I would feel energetic

(1) Disagree (2) Slightly Agree (3) Slightly Agree (4) Agree
25. I would act aggressively

(1) Disagree (2) Slightly Agree (3) Slightly Agree (4) Agree
26. My responses would be slow

(1) Disagree (2) Slightly Agree (3) Slightly Agree (4) Agree
27. My body would be relaxed

(1) Disagree (2) Slightly Agree (3) Slightly Agree (4) Agree
28. I would feel guilty

(1) Disagree (2) Slightly Agree (3) Slightly Agree (4) Agree
29. I would feel calm

(1) Disagree (2) Slightly Agree (3) Slightly Agree (4) Agree
30. I would feel moody

(1) Disagree (2) Slightly Agree (3) Slightly Agree (4) Agree
31. It would be easier to talk to people

(1) Disagree (2) Slightly Agree (3) Slightly Agree (4) Agree
32. I would be a better lover

(1) Disagree (2) Slightly Agree (3) Slightly Agree (4) Agree

33. I would feel self-critical

(1) Disagree (2) Slightly Agree (3) Slightly Agree (4) Agree

34. I would be talkative

(1) Disagree (2) Slightly Agree (3) Slightly Agree (4) Agree

35. I would act tough

(1) Disagree (2) Slightly Agree (3) Slightly Agree (4) Agree

36. I would take risks

(1) Disagree (2) Slightly Agree (3) Slightly Agree (4) Agree

37. I would feel powerful

(1) Disagree (2) Slightly Agree (3) Slightly Agree (4) Agree

38. I would act sociable

(1) Disagree (2) Slightly Agree (3) Slightly Agree (4) Agree

APPENDIX C

THE GENERAL SELF-EFFICACY SCALE (GSE)

Schwarzer and Jerusalem (1995)

1. I can always manage to solve difficult problems if I try hard enough.
(1) Not at all true (2) Hardly true (3) Moderately true (4) Exactly true
2. If someone opposes me, I can find the means and ways to get what I want.
(1) Not at all true (2) Hardly true (3) Moderately true (4) Exactly true
3. It is easy for me to stick to my aims and accomplish my goals.
(1) Not at all true (2) Hardly true (3) Moderately true (4) Exactly true
4. I am confident that I could deal efficiently with unexpected events.
(1) Not at all true (2) Hardly true (3) Moderately true (4) Exactly true
5. Thanks to my resourcefulness, I know how to handle unforeseen situations.
(1) Not at all true (2) Hardly true (3) Moderately true (4) Exactly true
6. I can solve most problems if I invest the necessary effort.
(1) Not at all true (2) Hardly true (3) Moderately true (4) Exactly true
7. I can remain calm when facing difficulties because I can rely on my coping abilities.
(1) Not at all true (2) Hardly true (3) Moderately true (4) Exactly true
8. When I am confronted with a problem, I can usually find several solutions.
(1) Not at all true (2) Hardly true (3) Moderately true (4) Exactly true
9. If I am in trouble, I can usually think of a solution.
(1) Not at all true (2) Hardly true (3) Moderately true (4) Exactly true
10. I can usually handle whatever comes my way.
(1) Not at all true (2) Hardly true (3) Moderately true (4) Exactly true
11. I am confident that I could resist offers of alcohol or drugs from my friends.*

- (1) Not at all true (2) Hardly true (3) Moderately true (4) Exactly true
12. I am sure that I can limit my use of alcohol or drugs if I want to.*
- (1) Not at all true (2) Hardly true (3) Moderately true (4) Exactly true
13. I am confident that I could resist drinking at a party where alcohol is available.*
- (1) Not at all true (2) Hardly true (3) Moderately true (4) Exactly true
14. I am confident that I can stop drinking alcohol if I want to.*
- (1) Not at all true (2) Hardly true (3) Moderately true (4) Exactly true
15. I am confident that I can stop using marijuana if I want to.*
- (1) Not at all true (2) Hardly true (3) Moderately true (4) Exactly true

* Additional items written by the study investigators based on recommendations of original GSE authors

APPENDIX D

MARIJUANA EFFECT EXPECTANCY QUESTIONNAIRE- BRIEF (MEEQ-B)

Torrealday, Stein, Barnett, Golembeske, Lebeaw, Colby, and Monti (2008)

The following pages contain statements about the effects of marijuana. Answer each statement according to your own personal thoughts, feelings, and beliefs about marijuana. We're interested in what you think about marijuana, not what others might think. Whether or not you've had actual marijuana experience, you should answer in terms of how you think marijuana affects the typical or average user. Answer according to how much you agree or disagree with each statement.

1. Marijuana makes it harder to think and do things (harder to concentrate or understand; slows you down when you move).

(1) Disagree strongly	(2) Disagree somewhat	(3) Uncertain
(4) Agree somewhat	(5) Agree strongly	

2. Marijuana helps a person relax and feel less tense (helps you unwind and feel calm).

(1) Disagree strongly	(2) Disagree somewhat	(3) Uncertain
(4) Agree somewhat	(5) Agree strongly	

3. Marijuana helps people get along better with others and it can help you feel more sexual (talk more; feel more romantic).

(1) Disagree strongly	(2) Disagree somewhat	(3) Uncertain
(4) Agree somewhat	(5) Agree strongly	

4. Marijuana makes a person feel more creative and perceive things differently (music sounds different; things seem more interesting).

(1) Disagree strongly	(2) Disagree somewhat	(3) Uncertain
(4) Agree somewhat	(5) Agree strongly	

5. Marijuana generally has bad effects on a person (you become angry or careless; after feeling high you feel down).

(1) Disagree strongly	(2) Disagree somewhat	(3) Uncertain
(4) Agree somewhat	(5) Agree strongly	

6. Marijuana has effects on a person's body and gives a person cravings (get the munchies/hungry; have a dry mouth; hard to stop laughing).

(1) Disagree strongly

(2) Disagree somewhat

(3) Uncertain

(4) Agree somewhat

(5) Agree strongly

APPENDIX E
MONITORING THE FUTURE SURVEY

Items pertaining to alcohol, marijuana and other drug use.

1. On how many occasions during the last 30 days have you had alcoholic beverages to drink? (This includes beer, wine, wine coolers and liquor)
(1) 0 occasions (2) 1-2 occasions (3) 3-5 occasions
(4) 6-9 occasions (5) 10-19 occasions (6) 20-39 occasions
(7) 40 or more occasions

2. On how many occasions during the past 30 days have you been drunk or very high from drinking alcoholic beverages?
(1) 0 occasions (2) 1-2 occasions (3) 3-5 occasions
(4) 6-9 occasions (5) 10-19 occasions (6) 20-39 occasions
(7) 40 or more occasions

3. On how many occasions during the past 30 days have you used marijuana (in any form)?
(1) 0 occasions (2) 1-2 occasions (3) 3-5 occasions
(4) 6-9 occasions (5) 10-19 occasions (6) 20-39 occasions
(7) 40 or more occasions

4. On how many occasions during the past 30 days have you used any other drugs (speed, ecstasy, etc)
(1) 0 occasions (2) 1-2 occasions (3) 3-5 occasions
(4) 6-9 occasions (5) 10-19 occasions (6) 20-39 occasions
(7) 40 or more occasions

5. During the past 30 days about how many alcoholic beverages, on average, did you consume at one time?

- (1) None
- (2) 1 drink/can/glass
- (3) 2 drinks/cans/glasses
- (4) 3 drinks/cans/glasses
- (5) 4 drinks/cans/glasses
- (6) 5 drinks/cans/glasses
- (7) 6 or more drinks/cans/glasses

6. During the past 30 days about how many marijuana cigarettes (or the equivalent) did you smoke a day, on average?

- (1) None
- (2) 1 a day
- (3) 2 a day
- (4) 3 a day
- (5) 4 a day
- (6) 5 a day
- (7) 6 or more a day

APPENDIX F

MARLOWE & CROWNE SOCIAL DESIRABILITY SCALE

(SHORTENED)

Crowne and Marlowe (1964)

1. Have there been occasions when you took advantage of someone?
Yes No
2. Have you sometimes taken unfair advantage of another person?
Yes No
3. Are you always willing to admit when you make a mistake?
Yes No
4. Are you quick to admit making a mistake?
Yes No
5. Do you sometimes try to get even rather than forgive and forget?
Yes No
6. Do you sometimes feel resentful when you don't get your own way?
Yes No
7. Are you always courteous, even to people who are disagreeable?
Yes No
8. Are you always a good listener, no matter whom you are talking to?
Yes No