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Adolescent response to peer substance use

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Adolescent Response to Peer Substance Use

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ABSTRACT

Substance use during adolescence is of particular concern because it is known to be associated with many undesirable outcomes. When an adolescent discovers that a peer is using substances, he or she is faced with a decision regarding the response to be taken (e.g., use substances with the peer, report it to authorities, tell the peer to stop). Available literature has given little consideration to this issue; therefore, the current study sought to examine the response of adolescents to discovering that a peer is using substances, within an ethnically diverse sample of 139 students from a public high school located in Florida. Since responses taken likely vary based on adolescents' own personal traits and characteristics, this study investigated how adolescents' gender, ethnicity, socio-economic status, grade level, and own use or non-use of substances were related to their response to discovering that a peer is using substances. Findings revealed that those students that reported personal marijuana use were more likely to report that they would respond to peer substance use in an undesirable way (e.g., use with the peer, do nothing), and less likely to take a positive action of any sort (e.g., discuss the peer's substance use with a trusted adult, tell the peer to stop). A second purpose of this study was to examine

whether or not an adolescent's relationship with the peer using drugs or alcohol (specifically, close friend versus classmate) was related to the action the adolescent takes in response to the peer's substance use. Findings revealed that overall students reported a higher likelihood that they would take a positive action of some sort if the peer using substances was a close friend than a classmate. More specifically, more students reported that they would tell a close friend to stop using substances than tell a classmate the same thing. On the other hand, students also reported that they would be more likely to use substances with a close friend than with a classmate. Implications of these findings for future research and practice are discussed.

Chapter One

Introduction

Substance Use in High School Adolescents: An Overview

Substance use during adolescence is of particular concern because it is associated with many undesirable outcomes (Johnston, O'Malley, Bachman, & Schulenberg, 2007), and is largely influenced by peers (Bauman & Ennett, 1994). When an adolescent discovers that a peer is using substances, that adolescent is faced with a decision regarding the response he or she should take (e.g., use substances with the peer, report it to authorities, talk to the peer). The present study investigated specific factors that may influence how an adolescent chooses to respond to peer substance use.

For the purpose of this study, substance use will be understood to be the use of any illegal substance as defined by age or government regulations. Substance use should not be confused with substance abuse, which involves using substances to an extent that meets criteria for a psychiatric disorder. Substance use during adolescence is an issue that has been of continuous concern over the years, dating back to at least the 1960's, when illicit drug use began to flourish in the younger population (Johnston, O'Malley, Bachman, & Schulenberg, 2007). Substance use has many known risks associated with it, with the most extreme being mortality and morbidity resulting from overdose, impaired driving, increased risk for HIV infection (National Institute on Alcohol Abuse and Alcoholism, 1997), and an increased risk for the development of a substance use disorder

(Dewit, Adlaf, & Offord, 2000). Additionally, using substances has been shown to expose toxins to the central nervous system (CNS), resulting in users exhibiting an inferiority in language skills and impaired frontal lobe functioning (Moss, Kirisci, Gordon, & Tarter R.E, 1994). The impact of this is a decreased sense of good judgment (Weschler, Davenport, Dowdall, Moeykens, & Castillo, 1994) as well as decreased academic achievement (Abdelrahman, Rodriguez, & Ryan, 1998).

Substance use has also been found to have a negative association with interest in school, motivation to achieve, and effort at school, all of which are known to be predictive of academic success (Bryant, Schulenberg, O'Malley, Bachman, & Johnson, 2003). In addition, substance use is related to a failure to complete high school (Zimmermen & Schmeelk-Cone, 2003).

Much of the previous research in substance use has focused on college students; however, more recently an awareness of substance use at the high school level has emerged. Sensation seeking is high during these years, and this can often result in experimentation with drugs (Greene, Krcmar, Walters, Rubin, Hale, & Hale, 2000). Additionally, adolescents are often struggling with discovering who they are and where they want to go in life, and substance use may be a coping method for feelings of anxiety related to this period of life (Hussong, 2007). During these already vulnerable years, many adolescents are exposed to drugs and alcohol in their everyday life. Consequently, substance use beginning during this time is a very realistic possibility.

Research clearly demonstrates that substance use is a common problem in high schools across the nation. For example, a 2003 national survey found that three fourths (74.9%) of high school students reported having had one or more drinks of alcohol in

their life, and half (44.9%) reported having one drink within the past month (Graunbaum, Kann, Kinchen, Ross, Hawkins, & Lowry, 2004). Current research shows that alcohol use remains a problem, as 52.5% of tenth graders, and 65.5% of twelfth graders reported consuming alcohol within the past year (Johnston et al., 2007). This same research indicates that the problem is not just with alcohol; within the past year, 23.9% of tenth graders and 32.4% of twelfth graders reported using marijuana, 31.7% of tenth graders and 44.7% of twelfth graders reported using tobacco, and 26.9% of tenth graders and 36.6% of twelfth graders reported trying an illicit drug (Johnston et al., 2007). Clearly, substance use among high school adolescents in America is an area that still warrants attention.

Within the broad area of high school substance use, researchers have examined many different topics. Commonly researched areas include the effects of various demographic characteristics on substance use. In particular, researchers have examined socio–economic status (SES), gender, and ethnicity. Regarding SES, the finding is that overall substance use may vary slightly by SES class, and is likely influenced by age. Additionally, use of specific drugs, such as cigarettes and cocaine, may be more sensitive to the influence of SES (Luthar & Ansary, 2005). Additionally, it is known that gender differences occur regarding substance use. For instance, in younger adolescent populations, the primary predictor of drinking for boys is whether their friends drink, whereas for girls, substance use is more likely to be related to levels of conduct disorder, which is defined as a "persistent pattern of physical violence against persons or property and/or severe violation of social norms" (Barber, Bolitho, & Bertrand, 1998, p.167). Finally, researchers have found that substance use is also influenced by ethnicity. For

example, research indicates that African American youth typically have the lowest rates of substance use, followed by Hispanic youth, while Caucasian youth display the highest rates (Johnston et al., 2007).

Another issue that has gained popularity in research is the social impact of adolescent substance use. When an adolescent uses substances, not only that individual adolescent is impacted, but also that adolescent's close friends and classmates. For instance, adolescents who said that their friends used drugs were at an increased likelihood of using drugs themselves (Bauman & Ennett, 1994). More specifically, within the context of social impact, research has suggested that the intimacy level of the friendship (i.e., close friends versus classmates) between the adolescent and the peer that is using drugs or alcohol may be important. Research has compared the influence of adolescents' close friends (i.e., those they consider best friends) and the influence of other peers within the social group, and found that it was only the influence of close friends that predicted transition into current alcohol use (Urberg, Degirmencioglu, & Pilgrim, 1997).

An understanding of risk and protective factors associated with adolescent substance use has increased in the recent years; however, there are still many questions that still remain unanswered. For instance, our understanding of how adolescents respond to peer substance use is incomplete. When an adolescent discovers that a peer is using drugs or alcohol, he or she is faced with many possibilities related to how he or she responds or reacts. How the adolescent chooses to react may be related to his or her own personal traits and characteristics, such as use of substances, or demographic characteristics.

Purpose of the Current Study

This study examined the response of adolescents to discovering that a peer is using substances. Furthermore, this study aimed to explore the relationship between adolescents' own personal traits and characteristics and their reactions. Specifically, the study investigated how adolescents' (1) gender, (2) ethnicity, (3) socio-economic status, (4) grade level and (5) own use or non-use of substances related to their responses to discovering that a peer is using substances. A second purpose of this study was to examine if an adolescent's relationship with the peer using drugs (specifically, close friend versus classmate) was related to the action the adolescent takes in response to the peer's substance use.

Research questions addressed through this study include:

1) What are the most common ways in which adolescents respond to discovering that a classmate is using substances?
2) What are the most common ways in which adolescents respond to discovering that a close friend is using substances?
3) Do differences exist in the way adolescents respond to peer substance use as a function of the intimacy level with the peer, specifically close friend vs. classmate status?
4) Do adolescents' responses to discovering that a classmate is using drugs or alcohol vary as a function of gender, race, grade level, and/or SES?
5) Do adolescents' responses to discovering that a close friend is using drugs or alcohol vary as a function of gender, race, grade level and/or SES?

6) Is there a relationship between adolescents' own use of drugs or alcohol and the way they respond to discovering a classmate is using drugs or alcohol?

7) Is there a relationship between adolescents' own use of drugs or alcohol and the way they respond to discovering a close friend is using drugs or alcohol?

Delimitations

A threat to the external validity of this study is the possibility that the findings do not generalize to all populations. The population used for this study was a low-SES, predominantly Hispanic high school located in a southern state. As this is one specific population, adolescents in different populations may react differently to discovering that a peer is using drugs. Additionally, the sample that was used in this study was small in number, and excluded both non-Engligh speaking students and students that had dropped out of high school. The exclusion of non-Engligh speaking students does not allow for examination of the effect of acculturation. Furthermore, the measures used were new, and therefore did not have preexisting data that supported their psychometric properties. The scales used only allowed for the measure of how adolescents responded to peer substance use overall, and not in relation to use of individual substances (i.e., alcohol, marijuana, cigarettes). Finally, the Peer Substance Abuse Resource Scale (PSARS) neglected to include a response option related to discussing the substance use behavior with the peer, as opposed to simply telling the peer to stop. In addition, the item "tell another peer" on the PSARS was found to be ambiguous, likely due to the multiple interpretations of the item (i.e., seek help from a peer versus gossip to a peer).

Chapter Two

Review of the Literature

Overview

This literature review will begin with a general discussion of substance use and substance abuse disorder. Next will be mention of how substance use is related to specific demographic characteristics, namely to gender, ethnicity, and SES. Following this will be a discussion of the risks associated with substance use, including: mortality resulting from overdosing, impaired driving, increased risk for HIV, toxin exposure to the CNS and decreased academic achievement. Then, a discussion regarding the particular impressionability and vulnerability of adolescents will follow. Next information regarding the social impact of adolescent substance use and the role that intimacy level of the friendship plays will be presented. Finally, literature relating to adolescent response to peer substance use will be summarized. The review will conclude with mention of how the current study will contribute to the literature.

Substance Use Disorder

A substance abuse disorder, as defined by the Diagnostic and Statistical Manual-IV (DSM-IV-TR, American Psychiatric Association, 2000), is:

> A maladaptive pattern of substance use leading to clinically significant impairment or distress, as manifested by one (or more) of the following, occurring within a 12-month period: (1) recurrent substance use resulting in a failure to

> fulfill major role obligations at work, school, or home (e.g., repeated absences or poor work performance related to substance use; substance-related absences, suspensions, or expulsions from school), (2) recurrent substance use in situations in which it is physically hazardous (e.g., driving an automobile or operating a machine when impaired by substance use), (c) recurrent substance-related legal problems (e.g., arrests for substance-related disorderly conduct), and (d) continued substance use despite having persistent or recurrent social or interpersonal problems caused or exacerbated by the effects of the substance. (pp.182-183).

Based on this definition, it can be inferred that the term "substance use" is appropriate for situations in which an individual is using, or has used, substances, but not to the extent that criteria for a substance abuse disorder has been met (i.e., the manifestation of clinically significant distress or impairment does not occur). Frequent or prolonged substance use, particularly when first use occurs in adolescence, puts an individual at a greater risk for developing a substance use disorder (DeWit, Adlaf, Offord, & Ogborne, 2000). As substance use, and substance use disorders, can be related to demographic characteristics, these specific characteristics will be discussed in the next section.

Relationship between Demographic Characteristics and Substance Use

Literature indicates that prevalence rates and associated features of substance use differ according to certain demographic characteristics. In particular, research has focused on examining the roles of gender, SES, and race.

Gender. Research has repeatedly demonstrated that gender differences occur in substance use prevalence rates. One study finding such differences is the Monitoring the

Future Study. This study has been conducted annually since 1975, allowing for examination of not only the current prevalence trends, but also how trends have changed over the years. Each year this study surveys nationally representative samples of 8th, 10th, and 12th grade students in both public and private schools. This annual cross-sectional study allows for examination of changes in trends over time. The most recent data included a sample of 48,500 students in 410 schools (Johnston et al., 2007). Participants filled out self-report questionnaires; items measured included usage level and frequency of use. A limitation of this study is that it only provides us information on adolescents who are currently enrolled in school, ignoring prevalence rates of students who have dropped out. Despite this, the Monitoring the Future Study is a widely known and used epidemiological study, and is commonly referred to in literature pertinent to substance use in youth.

Regarding gender, the results of this national study indicate that males typically have higher rates of overall substance use than females, and also have higher rates of frequent use (i.e., drink more often than females). In past years, males have reported higher rates of heavy drinking at all ages; however in recent years this difference has begun to diminish for 8th and 10th grade boys (Johnston et al., 2007). The current trend in gender differences is for the differences to be less significant at a younger age, and to materialize more with age.

Beyond prevalence rates, gender differences also emerge regarding predictors of substance use. To examine these differences, one study sampled 1,942 students, ranging from 12-17 years of age (Barber, Bolitho, & Bertrand, 1998). All participants filled out a self-report questionnaire, providing information on their demographic characteristics, self

esteem, school and family functioning, social lives, and substance use. In addition, conduct disorder, somatization disorder, emotional disorder, and hyperactivity were measured using the Child Behavior Checklist. Measures used were pre-existing, and had established reliability and validity.

Measures of alcohol consumption were added together to provide an overall drinking score, which was then normalized using a square root transformation. Drinking scores were calculated for varying age by gender groups, and were then, using nine separate stepwise multiple regression analyses, regressed on the peer pressure, intrapersonal, and family functioning predictors variables.

This study revealed that for younger (12-13 years old) males, drinking was most significantly associated with friends' drinking. For girls this age, conduct disorder was the strongest predictor of drinking. For 14-15 year old males, the association with friends' drinking declined while the association with conduct disorder increased. Girls who were 14-15 years old showed the opposite trend – the association with friends increased while the association with conduct disorder declined. This resulted in no significant gender differences for this age group, with both friends use and conduct disorder predicting alcohol use in both genders. Regarding the oldest group (16-17 year olds), males' drinking was most affected by friends drinking and conduct disorder, whereas female drinking was most affected by friends' approval of drinking. Overall, males showed a trend of the significance of conduct disorder increasing with age, while the opposite was true for females. With an increase in age, females showed an increase in importance of friends' drinking and friends' approval to drinking, but for males these factors only varied slightly with age (Barber et al., 1998).

Socio-Economic Status (SES). Researchers have also examined the role of SES in adolescent substance use. In the Monitoring the Future Study, SES was defined as a student's report of the average level of education of his/her parents. Findings reveal that for most drugs, SES does not appear particularly influential. An exception is that currently cigarette smoking is found to be more prevalent among adolescents from lower SES (i.e., less educated) families. Also of note, in past years cocaine use has been shown to be higher for students from higher SES families; however in recent years, this difference lessened (Johnston et al., 2007).

The Monitoring the Future Study examined SES in relation to prevalence rates of individual drugs. A different study examined rates of all drugs combined, and found that adolescents from higher SES families were more likely to use substances than adolescents from lower SES families (Luthar & Ansary, 2005). Participants for this research included 488 tenth grade students from northeastern schools. Of these, 264 were from a higher SES suburban school, and 224 were from a lower SES inner-city school. Substance use measures were adapted from those used in the Monitoring the Future Study, which have been shown to have adequate reliability and validity. Descriptive statistics for substance use at each school indicated that students in the suburban school reported significantly more substance use than students in the inner-city school (Luthar & Ansary, 2005).

An additional longitudinal study sought to explore the relationship between substance use and SES (Fothergill & Ensminger, 2006). This study assessed 952 participants in tenth grade and again in adulthood (32-34 years). Measures included demographics and a self-report survey on substance use. This study found that higher

levels of SES in adolescence were associated with decreased levels of substance use in adulthood (Fothergill & Ensminger, 2006). This may help explain the contradictory findings in the previously mentioned studies, in that the Luthar and Ansary (2005) study examined only tenth graders, who are not yet in adulthood, whereas the Johnston et al. (2007) study included participants in twelfth grade. Additional research is needed to clarify the relationship between SES and substance use across developmental levels.

Race. Additional research has explored substance use rates by race. For instance, Bogart, Collins, Ellickson, and Klein (2006) surveyed 3,393 thirteen-year old participants. Measures assessed demographic variables and self-reported use of alcohol, cigarettes, and marijuana. Findings from this study indicate decreased substance use rates for all three substances in African American youth as compared to Caucasian youth (Bogart et al., 2006).

Substance use prevalence rates by race were also examined through the Monitoring the Future Study. Findings revealed that the largest differences occur among students from Caucasian, African American, and Hispanic ethnic backgrounds (Johnston et al., 2007). In agreement with Bogart and colleagues' (2006) findings, African American students reported the lowest rates of substance use. Caucasian students were generally found to have the highest substance use rates, with rates for Hispanic students appearing slightly lower. The exception to this is for 8th grade students, where Hispanic students report the highest rates for nearly all drugs. The authors suggest that this may be explained due to higher dropout rates for Hispanic students, or due to the fact that Caucasian students begin drug use later in adolescence (Johnston et al., 2007).

It may also be that substance use in the Hispanic population is impacted by acculturation. Niemeier (2006) recruited 309 eighth graders, who self-identified as either Latino/Hispanic or Mexican, to fill out various self-report measures. Participants were clustered into three groups: those speaking predominantly Spanish, those speaking predominantly English, and those that were bilingual. Findings from this study indicate an increasing risk for substance use based on language acculturation – those in the Spanish speaking group were at lowest risk, followed by those in the bilingual group, and those in the English speaking group were at highest risk (Niemeier, 2006). There is a lack of research on substance use rates for the Hispanic population, making findings related to this population difficult to generalize.

While demographic differences in prevalence rates and reasons for use may occur, negative associated outcomes with substance use can arise for everyone. A discussion of these risks will take place in the next section.

Substance Use and Associated Risks

Potential mortality. The most extreme outcome associated with substance use is death, such as the possibility of overdose. Alcohol poisoning is one potential source of death. When an individual rapidly consumes alcohol, the blood alcohol content (BAC) in the brain rises rapidly, depressing the respiration centre or bringing about aspiration of the stomach contents into the respiratory tract (Polkolainen, 1997). In the year 2000, approximately 40,000 Americans died of drug or alcohol-induced causes (Centers for Disease Control and Prevention, 2003). Although drug users are more likely to commit suicide, the majority of overdose fatalities in young drug users are not suicidal acts, but accidental poisonings (Kjelsberg, Winther, & Dahl, 1995).

Another significant risk factor related to potential mortality is impaired driving. In 2006, it was estimated that 13,470 fatalities occurred in the United States due to traffic crashes that involved at least one driver or motorcycle operator with a blood alcohol concentration (BAC) of .08 or above (Chou, Dawson, Stinson, Huang, Pickering, Zhou, & Grant, 2006). Driving while impaired is especially problematic for the younger population; adolescents ages 16-20 were the drivers in approximately 11% of these traffic crashes (NHTSA, 2006).

HIV/AIDS is an additional serious risk factor related to substance use. The second leading killer of young people worldwide is HIV/AIDS (Kiragu, 2001). In addition, drug use is a strong risk factor associated with sexual risk behavior (Hawkins, Catalano, & Miller, 1992).

Recent research sought to examine the relationship between substance use, sexual risk behavior, and HIV/AIDS risks (Houck, Lescano, & Brown, 2006). Participants in this study were adolescents identified as having a history of unprotected sex. These adolescents were either recruited from primary care clinics or responded to flyers. Through self-report measures, this study surveyed 1153 adolescents, ages 15-21, on several known HIV/AIDS risk factors, some of which included: sexual activity, unsafe sex (condom use), and substance use. Measures were adapted from those used in PROJECT LIGHT (a government-funded multi-site prevention trial for young adolescents at high risk for HIV), and have previously been found to have adequate psychometric properties. Analyses included cluster analyses, followed by chi-square or analysis of variance. Results found that the cluster with the largest subgroup (49% of adolescent males, n=251) was defined by substance use and unprotected sex. This finding

demonstrates a relationship between substance use and unprotected sex, and indicates that adolescents who possess both traits are at increased risk for HIV/AIDS. A noted limitation of this study is that risk factors used were based on only one or two variables, and may not fully represent targeted constructs. Nevertheless, this study demonstrates that substance use plays a significant role in interacting with sexual risk behavior, increasing the risk for HIV/AIDS (Houck, Lescano, & Brown, 2006).

As previously mentioned research indicates, mortality as a result of overdose, impaired driving, and HIV/AIDS are all very severe, yet realistic, possible outcomes for modern adolescents. Death is clearly the most extreme risk factor, yet adolescent substance use is also associated with a wide range of additional risk factors that may yield detrimental effects. For instance, substance use, particularly during adolescence, is associated with damage to the central nervous system, which will be discussed next.

Toxin exposure to the central nervous system. Research has shown that frequent substance use can lead to toxin exposure to the central nervous system (CNS), and that these effects are particularly harmful during adolescence (Moss, Kirischi, Gordon, & Tarter, 1994). One reason for this is that adolescents typically differ from adults in their consumption of substances – binging rather than using at more of a slow and steady pace. In addition to this, adolescents may begin substance use before neurological maturation is complete, which leaves them more susceptible to substance effects (Moss et al., 1994).

A significant amount of research had been carried out on the effects of toxin exposure to the CNS; however, the vast majority of this has dealt with an adult population. One study aimed to expand the research to an adolescent population, in particular to examine the neurological characteristics of adolescent substance abusers

(Moss, Kirischi, Gordon, & Tarter, 1994). The sample included 107 adolescents, 38 of whom met DSM-III-R criteria for a substance use disorder (29% for alcohol abuse and 71% for alcohol dependence). Each participant was given a neuropsychological test, assessing specific neurocognitive domains, including: intelligence, academic performance, learning and memory, problem solving, abstracting ability, psychomotor capacity, and manual dexterity. Prior to assessment, members of the alcohol-abusing group were admitted to inpatient hospitalization, and were not tested until two weeks of abstinence from all drugs had occurred.

For each domain assessed, either a multivariate analysis of variance or a multivariate analysis of covariance was carried out in order to control for the effects of SES and/or IQ. Additionally, interaction effects of the gender x alcohol group were assessed, and when rejected, the significance of the main effects of alcohol group and/or gender was determined. In cases where the multivariate null hypotheses were rejected, univariate F-tests were conducted in order to establish the specific within-test group differences. Results revealed the nonalcoholic group outperformed the alcoholic group on several neurocognitive domains. IQ, measured by the WAIS-R, was found to have a main effect for group. Alcoholic participants scored lower on both verbal IQ and full-scale IQ. Scores on the Peabody Individual Achievement Test (PIAT) revealed alcoholic participants scored lower than nonalcoholic participants on Reading Recognition, Total Reading, and Spelling. On the Wisconsin Card Sort, alcoholic females had more perseverative errors than nonalcoholic females.

These results indicate that some degree of neurological deficit is present in adolescents with substance abuse problems. Specifically, deficits occur in terms of

intellectual functioning, reading skills, and spelling achievement. This suggests an overall inadequacy in language skills for adolescent alcohol substance abusers, which can be linked to hindered academic achievement. Additionally, the perseverative errors of memory is indicative of impaired frontal lobe functioning. A weakness of this study is that neuropsychological performance data from prior to initiation of substance use were not available; thus casual relationships cannot be made regarding direct effects of substance abuse on neuropsychological functioning. Despite this limitation, this research still demonstrates that some neuropsychological functioning abilities of adolescent alcohol abusers are weaker than those of non-abusers, as seen through impaired language skills and frontal lobe functioning (Moss et al., 1994).

Additional research found comparable results, and also found that substance abusers tended to make more commission errors on a vigilance test (Tarter, Mezzich, Hsieh, & Parks, 1995). In this study, 106 adolescents who met criteria for a DSM-III-R substance use disorder, and 74 who did not, were enlisted from alcohol and drug treatment facilities, juvenile court, group homes, medical facilities, various other ongoing research projects, and advertisement in the media. Prior to assessment, all participants were given a drug screen test to ensure drug use was not currently occurring. All participants were administered the following cognitive tests: either a WAIS-R or WISC-III (depending on age) for IQ; the Peabody Individual Achievement Test (PIAT) for academic achievement; the Test of Language Competence for receptive, expressive and comprehension abilities; a Stroop Test to measure perceptual speed; an assessment of rapidness of memory scanning; a continuous attention test for vigilance and impulsivity of responding; an evaluation of rhythmic motor response; and a measure of motor

inhibition. In addition, all participants filled out a self-report measure, the Drug Use Screening Inventory (DUSI), to document the overall severity of substance abuse.

An analysis of covariance was carried out in order to control for SES. Variables in the cognitive battery that were found to be significantly different between the substance abusers group and non-substance abusers group included: verbal and non-verbal scores on the IQ tests, perceptual speed score as measured by the Stroop Test, sustained attention score on the continuous attention test, language comprehension as measured by the Test for Language Competence, and academic achievement as measured by the PIAT. These cognitive capacity measures were all found to be significantly lower in the substance users group.

The poor performance of substance abusers in perceptual speed and sustained performance is thought by the authors of the study to be due to a limited suppression capability and an impulsive responding to irrelevant stimuli. Substance abusers also exhibited significantly lower verbal IQ scores and language capacity scores. This may be an indication that the impulsivity frequently reported in substance abusers is related to an inability to effectively cognitively regulate behavior via internal language. This is also a potential explanation for substance abusers not using good judgment in their actions, but rather acting impulsively and placing themselves in high risk situations, such as drug use. This study also has a limitation in the form of not being capable of determining a causal relationship due to the unavailability of data for participants' cognitive functioning prior to drug use. From this research it can be concluded that the substance abusers demonstrate significantly lower cognitive functioning in several domains, and it is

suggested that the impulsivity in substance users may have a cognitive component to it (Tarter et al., 1995).

Taken together, these studies showed that youth who abuse substances score significantly lower than non-abusers on cognitive functioning measures including: intelligence, language, and achievement tests. Such cognitive deficits are sufficient for compromised academic achievement. These cognitive deficits, along with other substance use related risks discussed in the next session, provide evidence that the use of substances has the potential to obstruct academic success.

Academic success. Adolescent substance use has negative associations with interest in school, bonding with school, intentions to attend college, and effort put forth at school, all of which are factors known to predict academic success.

A study examining substance use and known predictors of academic success collected a nationally representative sample of 1,897 students, ranging in age from 14-20 (Bryant, Schulenberg, O'Malley, Bachman, & Johnson, 2003). Self-report measures from the Monitoring the Future Study were used to collect information regarding substance use. These factors were called level 1 factors. Self-report data were also collected on demographics, as well as school-related factors, including: academic achievement, school interest, perceived school difficulty, effort and school bonding. These factors were called level 2 factors. Data analyses involved an hierarchical linear model growth curve model, in which the level 1 factors were the occasions of measurement nested within the level 2 factors.

The overall finding from this study was that low levels of academic achievement were associated with substance use. Specifically, adolescents reporting the highest levels

of school interest, school effort, and school bonding, as well as plans to attend college, were the least likely to report substance use (Bryant et al., 2003).

An additional study has demonstrated the impact of substance use on academic success (Diego, Field, & Sanders, 2003). Through self-report questionnaires, researchers surveyed 89 high school seniors on various factors, including substance use and current grade point average (GPA). Multiple regression analyses, using substance use as the dependent measures, demonstrated that GPA is a factor that accounts for a significant portion of the variation in adolescent substance use. While other factors (i.e., popularity, mental health) were included in these analyses, GPA accounted for the greatest portion of variance in substance use, demonstrating that academic achievement is a very significant predictor of substance use (Diego et al., 2003).

One further academic risk is failure to complete high school. Research on this topic was carried out using 681 adolescents from four different schools in a Midwestern city (Zimmerman & Schmeelk-Cone, 2003). Data for this study were collected over five time points (i.e., waves). At wave 1, adolescents were all in the ninth grade. Wave 2 occurred three years later, wave 3 after another additional year, wave 4 after yet another year, and finally after another two years wave 5 was conducted. During each wave, participants engaged in a 50-60 minute interview with the researcher. Following the interview they completed a self-report survey regarding substance use and school motivation factors. Additionally, at each wave the researchers assessed the overall school dropout rate by examining whether the respondents had yet graduated high school. At wave 1 all participants were in school, at wave 2, 2.6% had dropped out, at wave 3 the dropout rate was 4.3%, at wave 4 it was 11.2%, and at wave 5 the rate was 16.4%.

In analyzing the data, this study found that low school motivation contributed to continued drug use, but that school motivation did not contribute to graduation status. In addition, substance use increased the likelihood of not completing high school. A hypothesis for these findings is that the substance use effect was strong enough that school motivation was not a predictor variable of graduation status (Zimmerman & Schmeelk-Cone, 2003).

In sum, substance use brings with it a variety of associated risks. As the following section will discuss, adolescence is a time of particular vulnerability to these risks.

Impressionability during the Adolescent Years

Adolescence is seen as a transitional stage of development, linking childhood and adulthood. This is a period in which adolescents are determining who they are, and developing an identity (Paludi, 2002). This time of identifying oneself is commonly a time of testing the boundaries and trying new things (Paludi, 2002). While this is often a period of time associated with positive factors (i.e., developing a new skill, choosing a career path), negative factors are also commonly associated with this stage of life (Paludi, 2002). Substance use is one of these associated negative factors. This is particularly true for adolescents who struggle with achieving an identity, as drugs may be seen as a method for coping with feelings of anxiety related to this period of life (Hussong, 2007).

Additionally, during this adolescent time period of testing the boundaries, sensation seeking is high. As might be expected, during this time of heightened sensation seeking, adolescents commonly experiment with drugs (Greene, Krcmar, Walters, Rubin, Hale, & Hale, 2000). Research has demonstrated that both the anxiety and sensation seeking that are characteristic of adolescence are also related to drinking motives.

One study examined empirical research over the past 15 years, focusing on adolescent drinking motives (Kuntsche, Knibbe, Gmel, & Engels, 2006). A thorough review of the literature revealed 82 articles that qualified for the study. In examining personality traits related to drinking motives, sensation seeking and anxiety sensitivity were two trends that were among the most common to appear. Sensation seeking was defined as a personality trait characteristic of the desire for intense and novel experiences. Anxiety sensitivity was defined as a personality trait characteristic of displaying fears concerning the potential negative consequences of anxiety symptoms. Whereas sensation seekers use drugs because it is something exciting that has the potential to enhance the situation, the anxiety sensitive use substances as a coping strategy for the feelings of anxiety (Kuntsche, Knibbe, Gmel, & Engels, 2006).

While the motives to use substances differ for these two personality types, both demonstrate the particular vulnerability to engage in substance use, thus demonstrating that adolescence is a time of increased likelihood for substance use. In addition, adolescence is a period in which friendship becomes of increasing importance (Berk, 2006). Thus, as the preceding section will demonstrate, it is not surprising that peer influence is strong during this time period.

Social Impact on Adolescent Substance Use

Peer influence. Peer influence plays a very substantial role in adolescent substance use. When an adolescent's peer group uses drugs, the adolescent is provided with a model of drug use, more opportunities and easier access to drugs, and norms that approve of drug-use behavior (Oetting & Donnermeyer, 1998).

To examine peer influence, one study surveyed 548 adolescents (Chopak, Vicary, & Crockett, 1998). Through self-report measures, participants responded to questions regarding their frequency of substance use, perceived risk of using substances, parental use of substances, parental disapproval of substance use, and frequency of friend substance use. Findings indicated that the most significant correlation was between an adolescent's own substance use and his/her friends' substance use (Chopak et al., 1998). Because this study was conducted using adolescents' perceptions of how much friends drink, (vs. actual use) the findings actually reflect that adolescents' perceptions of peer substance use (vs. actual use) is associated with adolescents' own substance use.

Additional studies have attempted to differentiate the influence of perceived peer substance use from actual peer substance use. Longitudinal research included 428 adolescents in participation of an initial survey, and 416 in a follow-up survey one year later (Poelen, Engels, Van Der Vorst, Scholte, & Vermulst, 2007). Participants self-reported the frequency and amount of their alcohol consumption. In addition, adolescents wrote down the name of their best friend, and provided information on frequency and amount of the friend's alcohol consumption. In order to determine if this information was accurate, the best friends were then contacted. Of these best friends, 301 of them agreed to participate, and filled out identical measures. Results indicated high levels of agreement on participant perception of friend use, and on actual friend use, indicating that participants were fairly accurate in their reports of best friend's drinking habits.

To analyze the data, structural equation modeling was conducted. Results revealed a relationship between participant drinking and best friend drinking. However, this effect was not maintained at the one-year follow-up; adolescents and friends drinking

levels were not related. This indicates that friend's drinking did not predict continuation of drinking. However, at the follow-up, nearly half of participants indicated that they were affiliated with a new friend. The researchers did not continue the study to examine the association between participants' substance use and new friends' substance use. This finding suggests that adolescent substance use may be related only to the substance use of current friends (Poelen et al., 2007).

Most research indicates that in some way, to some degree, peer influence is associated with adolescent substance use. One potential reason that research has found discrepant results regarding the extent to, and way in which, peer influence operates, may be that different researchers use different terminology to describe peers. While much available research uses the overarching term "peer", some researchers examine "friend", "best friend", "classmate", etc. Research indicates that the person studied is of importance, as the magnitude of peer influence may be related to the intimacy level that the adolescent has with the peer.

Intimacy level. The impact a classmate or acquaintance has on an adolescent's substance use may differ from the impact of a close friend. One longitudinal study using 1,028 adolescent participants examined the influence of close friend versus the influence of the larger friendship group on substance use (Urberg, Degirmencioglu, & Pilgrim, 1997). All participants filled out self-report measures on frequency of past cigarette and alcohol use, and the frequency of currently using them (within the past month). In addition, participants filled out friendship nominations, indicating the name of their closest friend, and also indicating members of their peer group, defined as "people you hang around with". Sociograms were used to assign individuals to friendship groups

based on common links among friendship nominations. Links were defined as common friendship choice between individuals. Criteria for assigning individuals to a particular friendship group include: having at least two links into the group, having at least 50% of their own links into the group, and the group must stay intact even if 15% of the links are removed. Each individual was only a member of one group, and those individuals who did not meet criteria for fitting into a group were excluded from the study. This resulted in large friendship groups, typically with between 80-100 adolescents in each group.

Findings from this study indicated that there is an influence of close friends as well as friendship groups on substance use. However, only close friends predicted the initiation of using both cigarettes and alcohol, as well as predicted the transition into current alcohol use. These results indicate a greater influence of close friend than friendship group on adolescent substance use (Urberg et al., 1997).

Adolescent response to peer substance use. The literature on adolescent response to peer substance use is limited. Research has begun to examine this area in terms of whether adolescents believe it is important to report peer substance use to the authorities. One study surveyed 41 ninth graders and 41 twelfth graders on whether or not they felt peers have a duty to intervene when a friend is involved in drugs (Tisak, Tisak, & Rogers, 1994). In addition, participants that did feel there was an obligation to intervene were asked to indicate the action that should be taken. Participant responses were coded into three possible categories: discussing the incident with the friend, reporting the incident to authorities, or other.

Findings revealed whether or not adolescents felt a peer was obligated to intervene varied by drug type. A high proportion (94%) of adolescents felt that a peer was

obligated to intervene when a friend was smoking marijuana or drinking beer, while a lower proportion (58%) felt intervening was necessary when the drug was cigarettes. In addition, the majority (84%) felt that they should discuss the behavior with the peer, while very few (16%) felt it was necessary to report the behavior to authorities. Responses in the "other" category were limited and were not described in detail (Tisak, Tisak, & Rogers, 1994).

This study is a start to understanding adolescent reactions to peer substance use, but a lot is still unknown. For instance, this study only examined whether adolescents felt it was appropriate to talk to the peer or to tell authorities. It did not indicate who authorities were (i.e., parent, principal, police), or provide the adolescent with additional options (i.e., seek advice from a separate peer, use with them, or ignore the situation and not respond at all).

In addition, the study conducted by Tisak et al. (1994) did not examine participants' own level of substance use. It may be that substance users respond differently than non-users to peer substance use. Tisak et al. (1994) also used the generic term "peer" rather than defining whether this was a close friend, friendship group member, or just an acquaintance. It is possible that responses to peer substance use would differ based on both the intimacy level of the peer involved, as well as the adolescents' own use or non-use of substances.

The Current Study

Substance use is prevalent among adolescents (Johnston et al., 2007). The high rates of adolescent substance use are alarming in part because of the wide range of negative associated risks, such as: mortality and morbidity resulting from overdose,

impaired driving, increased risk for HIV infection (NIAAA, 1997); toxin exposure to the CNS, resulting in an inferiority in language skills and impaired frontal lobe functioning (Moss et al., 1994), a decreased sense of good judgment (Weschler et al., 1994) as well as decreased academic achievement (Abdelrahman et al., 1998) and a failure to complete high school (Zimmermen & Schmeelk-Cone, 2003).

Although literature is inconsistent in terms of whether it is the actual or perceived peer influence that is responsible, it is clear that peer substance use does impact adolescent substance use (Chopak et al., 1998; Poelen et al., 2007). Additionally, the extent of peer influence is of greater significance when the peer is a close friend (Urberg et al., 1997). Peer substance use has also been researched in terms of how adolescents react to it, although the research on it is limited to one study. Preliminary findings suggest that adolescents believe they do need to intervene when a peer is involved in drugs, and more specifically, that most feel the appropriate reaction is to talk to the peer about it (Tisak et al., 1994).

The current study attempted to expand on existing literature by incorporating more variables into the examination of how adolescents respond to peer substance use. Participants were provided with a wider range of possible responses, and indicated their responses to both a close friend's substance use and a classmate's substance use. In addition, data was collected on the adolescent's own use of substances. With the addition of these variables, more specific information was gathered on adolescent response to peer substance use.

This study provided important information in understanding the relationships between peer relations and adolescent substance use. For instance, by determine how an

adolescent will likely respond to the discovery that a peer is using drugs, practitioners are able to ensure that appropriate resources are prepared in order to best provide help. Additionally, school psychologists may want to use the results of the current study to better educate students regarding the variety of options available to students who become aware of peer substance use.

Chapter Three

Method

Participants

Participants for this study consisted of students enrolled in grades nine through twelve at a public high school located in Florida. The school at which this study took place had approximately 1900 students enrolled at the time, and was considered to be a predominantly low SES school, as indicated by 66.8% of the student population receiving free or reduced lunch. Also of note, this was a predominantly (64.8%) Hispanic population. This group was of particular interest, due to a paucity of available research on this specific population. The remainder of the population at the high school was primarily Caucasian (17.6%) or African American (9.7%).

To ensure that the sample obtained was an accurate demographic representation of the entire school, chi square tests were conducted, comparing the schools demographics to the samples demographics. Overall the sample used was representative of the population of the high school, with the one exception being in relation to gender (i.e., significantly more females in the sample than is representative of the population). Table 1 provides demographic characteristics for both the overall population (entire high school) and the sample used in the current study.

Table 1

Demographic Information

	% of Population	% of Sample
Gender		
Male	48.3	26.6
Female	51.7	73.4
Grade		
9th	30.4	30.9
10th	26.5	18.7
11th	24.2	22.3
12th	18.8	28.1
Receives Free/Reduced Lunch		
Yes	66.8	69.6
No	33.2	30.4
Race		
African American	9.7	8.6
Asian/Pacific Islander	1.7	7.2
Hispanic	64.8	56.8
Native American	.3	.7
White	17.6	20.9
Other	5.9	5.8

Approval to conduct the study was obtained thorough the participating school district's office of assessment and accountability, as well as from the University of South Florida (USF) Institutional Review Board. A faculty member of the School Psychology Program at USF served as the principal investigator of the larger study and also supervised data collection. The author of this study was an active member of the research team and provided support for the development and implementation of the larger study.

Participant Selection

To ensure that students in the sample had reading skills adequate for completion of the survey, only those in standard diploma classes and those who had English listed as

their primary language, and/or had demonstrated proficiency in English were recruited for participation. This involved not distributing parental consent forms to students who were English Language Learners (ELL) classified as LYA (students who do not speak English) or LYB (students who are bilingual, but not predominantly English speaking). At the time of data collection, this meant that approximately 29% of the student body was not recruited due to the previously stated inclusion criteria for this study. Only participants who had returned an informed consent form signed by a parent or guardian were included in this study. Students were not individually paid for their participation in this study. However, incentives were offered to increase the rate of participation. All students who returned parent consent forms were entered into a drawing to win one of four gift certificates to Best Buy, valued at $50 each.

Procedures

Prior to data collection, details regarding the study were given during each scheduled English class. English teachers were provided copies of parent consent forms and distributed them to all students who met the inclusion criteria specified above. English class was chosen because it is a required class for all standard diploma students, and ensured the sample would include those students who had English listed as their primary language or were proficient in English.

Active parental consent was required for each participant. Active consent requires parents to sign a participation form which outlines all the potential risks and benefits associated with their child's participation. Forms were available in both Spanish (Appendix A) and English versions (Appendix B), and students received whichever version corresponded with their parents' primary language. The form sent home with

each student provided parents with the principal investigator's contact information in order to give parents the opportunity to discuss their concerns or questions about the nature of the study and their child's involvement. It was made clear that student participation was completely voluntary, and that not participating would in no way affect the student's status, academic grades, or relationship with the school. Students were to return signed parental consent forms to teachers, and teachers then placed forms in a designated box located in the teacher mailroom. The primary investigator collected these forms and compiled a list of all participants.

Data collection took place in October of 2008, over a period of three days. Researchers involved in the study took small groups of students (approximately 10 at a time) participating in the study into empty classrooms to complete the survey. This method ensured that each participant who returned a parent consent form was able to participate in the survey (i.e., if a participant was absent on one day of data collection he or she were included another day). Participants were seated far enough away from each other (at least one empty desk in between each participant) to ensure privacy in responses. Researchers involved in this process included the primary investigator of the current study (a graduate student of the USF School Psychology program), and several other USF-affiliated research assistants (also graduate students in the USF School Psychology program). At least two researchers were with each group of student participants at all times.

Prior to beginning the packet of surveys, each participant completed a student assent form which outlined the risks and benefits to participating in the study (Appendix C). Students were also provided with contact information, both within the school and

within the community, for resources they could access should they need to discuss personal issues related to substance use. The research team assessed readability of the assent letter in advance to ensure that all students in grades 9-12 would be able to adequately understand their assent to participate in the study. The student assent form was read aloud to the students by one of the researchers. An opportunity to ask questions was then given, and following any questions, students were reminded that they were free to leave the study (i.e., withdraw participation) for any reason at any time. All student assent forms were collected once signed, and kept separate from the rest of the survey in order to maintain confidentiality of student participants' names.

The researchers instructed students who had signed consent and assent forms on how to answer Likert-type questions using an example of a frequency ("I go to the beach") and agreement ("Going to the beach is fun") item. Throughout survey administration, participants were behaviorally observed to ensure their well-being. No participant was observed to be upset (crying, aggressive, leaving study), but had this occurred, a researcher would have talked with them and asked them if they would like to withdraw from the study, and also would have provided them with an opportunity to speak with a school counselor if desired by the student.

All survey measures were counterbalanced to control for order effects using versions "A" through "D". Research assistants circulated the room during the administration of the surveys to assist students who had questions. Students were encouraged to ask questions if any items were not clear. Upon each student's completion of the survey packet, a member of the research team then examined the survey packet to determine if the student had inadvertently missed any questions and/or made errors. If a

student did make errors or skip questions, he or she was asked if they intentionally skipped the questions, and if not, was asked to complete the missed questions or correct the errors.

The completed surveys, along with the consent forms, were retained by the PI. The informed consent forms were seen only by the PI and the research team, and were stored in a locked file cabinet in the PI's University office. Completed surveys were also seen by the PI and research team, but these surveys contained no identifiable information that would allow for them to be tracked back to specific participants. Data from these surveys were entered into a computer database for analysis, and original surveys were then stored by the PI.

Measures

The research design used in this study was non-experimental. All measures used in this study were piloted during the spring of 2008, in order to assess readability and time completion. In piloting the survey, twenty high school students enrolled in an honors psychology class were administered the measures. An additional pilot study was conducted in the fall of 2008, This second pilot was done to further explore results with a sample more similar to the one to be used in the actual study (i.e., including students enrolled in courses other than "honors" classes). Fifty high school students enrolled in general education psychology classes participated. Following survey completion, eight of these students then participated in a discussion with the PI during which they assessed the survey for clarity. No students in either of the piloting studies required longer than 20 minutes to complete the survey, and no questions regarding readability arose. Data from these studies were analyzed for reliability through calculation of Cronbach alpha

coefficients, but were not included in any analyses conducted as answer the research questions. Following these analyses all surveys were stored in a locked file cabinet in the PI's office. The subsequent measures were included in the pilot studies, and were then used in the present study to collect data relevant to variables of interest.

Demographics. Demographic information was obtained via student self-report (Appendix D). This included basic information relevant to this study, including: gender, ethnicity, age, grade, and SES, which was indicated through answering "yes" or "no" to the question "do you receive free or reduced price school lunch?" In addition, the survey included other questions relevant to the larger study, which included: school attendance, estimated GPA, the frequency of their behavioral discipline referrals in the last year, the frequency of their out of school suspensions in the last year, the frequency of their arrests throughout the last year, if they had ever been diagnosed with mental health problems, and if they had ever been prescribed any medication for mental health problems. All questions were close ended (with the exception of an "other" category for ethnicity, in which participants were able to write in their answer) and participants indicated the one choice that was most representative of them.

Peer Substance Abuse Resource Scale (PSARS; Harbor, 2008). The PSARS is an instrument that was developed by the primary investigator of the larger study (Appendix E). It is a 20-item questionnaire designed to measure students' responses to a close friend's substance use, and to a classmate's substance use. Response options were determined by first reviewing the literature pertinent to this topic and then discussing other potential options with school psychologists and school psychology trainees. These response options were verified through the pilot study. It is a self-report measure, as this

is necessary to assess how an adolescent believes he/she would respond to a peer's substance use. The PSARS was developed because there is not a pre-existing measure that assesses similar constructs.

The scale consists of two subscales, the Peer Substance Abuse Resource Scale – Close Friend (PSARS-CF), and the Peer Substance Abuse Resource Scale – Classmate (PSARS-CM). The PSARS-CF asks "How likely would you be to do any of the following if you had a CLOSE friend who was using drugs or alcohol?", while the PSARS-CM asks "How likely would you be to do any of the following if you had a CLASSMATE (who is not a close friend) who was using drugs or alcohol?". Each section provided the same 11 possible actions, including: "tell them to stop", "report their uses to authority", "seek advice from trusted adult in the community", "do nothing", "use with them", "tell another peer", "call a teen help line", "seek help from adult at school", "talk to my parents", "talk to my peers' parents", and "other", which provided a blank space for students to write in their own responses. Respondents were asked to indicate on a 4-point scale (1 = extremely unlikely, 2 = somewhat unlikely, 3 = somewhat likely, and 4 = extremely likely) the likelihood that they would engage in each various action.

For each of the two subscales, in interpreting individual results, higher numbers therefore indicate an increased likeliness of that specific action being taken by the student. The responses "Do Nothing" and "Use with them" were not viewed as positive responses, and to account for this, these two were reverse scored.

As this scale has not been empirically used prior to this study, reliability was established though calculation of Cronbach alpha coefficients. Cronbach alpha

coefficients were calculated for data from the pilot study and resulted in a coefficient of .87 for the PSARS-CF and a coefficient of .82 for the PSARS-CM.

Teen Alcohol and Drug Use Scale (TADUS; Harbor, 2008). The TADUS is a measure that was developed by the primary investigator of the larger study (Appendix F). Rather than using a pre-existing measure of alcohol and drug use, this measure was created because a pre-existing measure fitting the researchers' exact needs was unavailable.

This scale is a 17 item self-report measure assessing the frequency of adolescents' alcohol and substance use. Each item lists a different substance and participants reported how often they had used the substance during the past year. Responses were given on a 7-point scale with higher ratings indicating increasing frequency of use (i.e., zero occasions, 1-2 occasions, 3-5 occasions, 6-9 occasions, 10-19 occasions, 20-39 occasions, and 40 or more occasions). This specific metric of occasions was used because it reflects that used in the Monitoring the Future study, which is known to have sound psychometric properties (Johnston et al., 2007). Lower scores on each item indicate that specific substance is used less by the student.

Separate studies were conducted to test reliability of this measure. Specifically, reliability was established through use of Cronbach alpha coefficients. These calculations were carried out on data from the pilot study, resulting in a coefficient of .82 for the entire scale.

Variables

The preceding measures provided information on variables relevant to this study. The specific variables of interest are discussed below.

Dependent. The dependent variable used in this study was how an adolescent responds to peer substance use. This is defined as the specific action that an adolescent would take upon discovery of the peer using substances. There are two separate DVs, the first being how an adolescent responds to a classmate's substance use, and the second being how an adolescent responds to a close friend's substance use.

Independent. Several independent variables were used in this study. One was demographic characteristics, including gender, ethnicity, grade level, and SES (defined by free or reduced lunch). Another was adolescents' own level of substance use.

Data Analysis

To answer each of the research questions presented in this study, a series of statistical analyses were conducted. All analyses were conducted through the use of SPSS.

Question One: What are the most common ways in which adolescents respond to discovering that a classmate is using substances?

To determine the most common ways in which adolescents respond to discovering that a classmate is using substances, results from the PSARS-CM were analyzed such that responses to individual items were examined. Descriptive statistics were obtained for each possible item (e.g., tell them to stop, talk to parents), including mean, median, mode and frequency of each response option.

Question Two: What are the most common ways in which adolescents respond to discovering that a close friend is using substances?

To determine the most common ways in which adolescents respond to discovering that a close friend is using substances, results from the PSARS-CF were

analyzed, such that responses to individual items were examined. Descriptive statistics were obtained for each possible item (e.g., tell them to stop, talk to parents), including mean, median, mode and frequency of each response option.

Question Three: Do differences exist in the way adolescents respond to peer substance use as a function of the intimacy level with the peer, specifically close friend vs. classmate status?

Paired t-tests were conducted in order to compare the mean scores for adolescents who endorsed responses on each item regarding a classmate's substance use versus a close friend's substance use.

Question Four: Do adolescents' responses to discovering that a classmate is using drugs or alcohol vary as a function of gender, race, grade level, and/or SES?

In order to examine whether adolescents' responses to discovering that a classmate is using drugs or alcohol vary as a function of gender, race, grade level, and/or SES, multiple regression analyses were conducted. These analyses were first done in order to determine any interaction effects among variables (e.g., gender X race) in predicting likelihood of making any responses (i.e., taking any actions). Additional multiple regression analyses were conducted to determine the extent to which the overall likelihood that an adolescent would respond was predicted by demographic characteristics (e.g., gender, race, grade level, SES).

Question Five: Do adolescents' responses to discovering that a close friend is using drugs or alcohol vary as a function of gender, race, grade level, and/or SES?

In order to examine whether adolescents' responses to discovering that a close friend is using drugs or alcohol vary as a function of gender, race, grade level, and/or

SES, multiple regression analyses were conducted. These analyses were first done in order to determine any interaction effects among variables (e.g., gender X race) in predicting likelihood of making any responses (i.e., taking any actions). Additional multiple regression analyses were conducted to determine the extent to which the overall likelihood that an adolescent would respond was predicted by demographic characteristics (e.g., gender, race, grade level, SES).

Question Six: Is there a relationship between adolescents' own use of drugs or alcohol and the way they respond to discovering a classmate is using drugs or alcohol?

For the question of whether an adolescents' own use of drugs or alcohol was related to the way he or she responds to discovering a classmate is using drugs or alcohol, survey results were examined by calculating correlation statistics to compare individual responses from the PSAR-CM subscale with the individual responses from the TADUS scale. Results were analyzed using three separate substance use variables: marijuana use, cigarette use, and alcohol use (this variable includes participants that endorsed using any of the following substances: wine/wine coolers, beer, or liquor). Additionally, multiple regression analyses were conducted to determine the extent to which the overall likelihood that an adolescent would respond was predicted by the adolescent's own substance use. Again, substance use included the same three variables: marijuana use, cigarette use, and alcohol use.

Question Seven: Is there a relationship between adolescents' own use of drugs or alcohol and the way they respond to discovering a close friend is using drugs or alcohol?

For the question of whether an adolescents' own use of drugs or alcohol was related to the way he or she responds to discovering a classmate is using drugs or alcohol,

survey results were examined by calculating correlation statistics to compare individual responses from the PSAR-CF subscale with the individual responses from the TADUS scale. Results were analyzed using three separate substance use variables: marijuana use, cigarette use, and alcohol use (this variable included participants that endorsed using any of the following substances: wine/wine coolers, beer, or liquor). Additionally, multiple regression analyses were conducted to determine the extent to which the overall likelihood that an adolescent would respond was predicted by the adolescent's own substance use. Again, substance use included the same three variables: marijuana use, cigarette use, and alcohol use.

Chapter Four

Results

Overview

This chapter will begin with a discussion on the treatment and handling of the data following data collection. Following that, frequency rates from the TADUS will be presented. Next, descriptive statistics and frequencies for the PSARS will be provided, as will results from principal axis factor analysis. The reliability of the PSARS will then be discussed. Items on the PSARS-CM will then be compared to items on the PSARS-CF through use of paired *t*-Tests. Next, analyses examining the correlation between individual items on the PSARS and substances of interest on the TADUS (i.e., alcohol, cigarettes, and marijuana) will be presented. Finally, the results from multiple regression analyses conducted to examine the extent to which the overall likelihood that an adolescent would respond based on demographic characteristics and own substance use will be presented.

Treatment of the Data

Data from this research were entered into SPSS by graduate student members of the research team that were involved in data collection for the larger study. Data were then rechecked for accuracy. Specifically, data entered for approximately 15% of participants was randomly selected and re-checked for accuracy (i.e., data entered into SPSS file matched raw data). Additionally, the dataset was checked for scores outside of

the possible range of responses. This was done through running descriptive statistics for all variables of interest, and examining minimum and maximum values for each, to ensure all values were within the possible range. Data entry was found to be 99.9% accurate, and the few mistakes that were found were corrected. No survey was deemed unusable (i.e., missing a substantial amount of data or completed incorrectly), resulting in data for 139 participants.

Frequency of Substance Use

Frequency distributions were calculated to determine specific rates of substance use in the sample. Overall, the majority of participants reported engaging in substance use on zero occasions. For example, the most commonly used substance was reported to be wine/wine coolers (endorsed by 45.3% of respondents). Therefore, the majority of participants had consumed wine/wine coolers on zero occasions, and there was limited variability among frequency of use reported (reporting use of the substance on 1-2 times, 3-5 times, etc.). Based on this, the formerly continuous frequency of use scales were dichotomized into two categories: use on zero occasions, and use on any occasion. This resulted in data indicating that the substance had been used within the past year, or had never been used within the past year. Table 2 displays frequency of substance use within the sample. Data are displayed is descending order, so that most commonly used substances are presented first.

Table 2

Frequency of Substance Use by Individual Substance (n=139)

Item/Substance	*n*	%
Wine/Wine Coolers	63	45.3
Liquor	54	38.8
Beer	47	33.8
Prescription Drugs – Yours	31	22.3
Marijuana	27	19.4
Cigarettes	23	16.5
Prescription Drugs – Not Yours	15	10.8
Over the Counter	11	7.9
Inhalants	10	7.2
Stimulants	7	5.0
Cocaine	5	3.6
Hallucinogens	5	3.6
Ecstasy	5	3.6
Barbituates	3	2.2
Crack	1	0.7
Steroids	1	0.7
Meth	1	0.7
Chewing Tobacco	1	0.7
Heroine	1	0.7

Based on the infrequent use of many of the substances, data were further collapsed by combining substances into three clusters: marijuana, cigarettes, and alcohol (which included wine/wine coolers, liquor, and beer). Many of the substances were therefore not analyzed, due to a low number of participants reporting not using the substance on any occasion. Alcohol was the most frequently used substance, with 55.4% of the sample having drank within the last year. Marijuana and cigarette use had similar trends in frequencies, with 19.4% of the sample having used marijuana, and 16.5% of the sample having used tobacco. Each substance use cluster was also examined in terms of

demographic makeup. Specifically, alcohol, marijuana, and cigarette use were all broken down by gender, ethnicity, grade, and free/reduced lunch. Table 3 presents these data, and compares use rates to the demographic breakdown of the entire sample.

Table 3

Frequency of Substance Use by Substance Categories

	Total Sample *(n=139)*		Alcohol Users *(n=77)*		Marijuana Users *(n=27)*		Cigarette Users *(n=23)*	
Characteristic	N	%	N	%	N	%	N	%
Gender								
Female	102	73.4	55	71.4	21	77.8	17	73.9
Male	37	26.6	22	28.6	6	22.2	6	26.1
Ethnicity								
African Am.	12	8.6	5	6.5	1	3.7	2	8.7
Hispanic	79	56.8	50	64.9	17	63.0	13	56.5
White	29	20.9	15	19.5	8	29.6	6	26.1
Other	19	13.7	7	9.1	1	3.7	2	8.7
Grade								
9^{th}	43	30.9	23	29.9	7	25.9	7	30.4
10^{th}	26	18.7	10	13.0	7	25.9	5	21.7
11^{th}	31	22.3	17	22.1	3	11.1	6	26.1
12^{th}	39	28.1	27	35.1	10	37.0	5	21.7
Free/Reduced Lunch								
Yes	97	69.8	58	75.3	21	77.8	15	65.2
No	42	30.2	19	24.7	6	22.2	8	34.8

As can be seen, the demographic makeup of each substance use cluster was overall fairly comparable to the demographic makeup of the total sample, suggesting relatively similar rates of use regardless of gender, ethnicity, grade level, or SES.

Using this final collapsed version of the TADUC, reliability was then established for this scale, and the Cronbach alpha coefficient was determined to be .72. Regarding individual substance clusters, the reliability for Alcohol was found to be .77. The reliability for Marijuana and Cigarettes was not calculated due to these clusters including only one substance each. Each substance use cluster showed a positive correlation with each other substance use cluster (e.g., alcohol use yielded a positive correlation with cigarette use and marijuana use).

PSARS Descriptive Analyses

Means and standard deviations were obtained for responses to each item on the PSARS. Table 4 provides the means and standard deviations for each item on the PSARS-CF, while Table 5 provides the means and standard deviations for each item on the PSARS-CM. Additionally, both tables present the percentage of participants that selected each possible response. Data are presented in descending order, with the item with the highest mean presented first and the item with the lowest mean presented last.

Table 4

Descriptive Statistics for the PSARS-CF (n=139)

Item #/Action	*M*	*SD*	% Selecting response			
			1	2	3	4
1.Tell them to stop	3.54	0.75	2.2	8.6	21.6	66.9
3.Talk to adult in community	2.57	1.19	25.9	22.3	19.4	31.7
9. Talk to my parents	2.22	1.26	43.9	15.1	14.4	25.9
8. Talk to adult at school	2.00	1.17	51.1	12.2	19.4	15.8
10. Talk to friend's parents	1.87	1.09	52.5	19.4	13.7	13.1
6. Tell another peer	1.87	0.96	46.8	22.3	23.7	5.0
7. Call Help Line	1.82	1.05	54.0	18.0	16.5	10.1
2. Report to authorities	1.62	0.87	59.7	21.6	14.4	3.6
4. Do nothing	1.43	0.84	74.1	12.9	7.2	5.0
5. Use with them	1.30	0.71	79.9	9.4	5.8	2.9

Note. Means can range from 1.0 to 4.0, with 1.0 indicating an adolescent is less likely to take that specific action, and 4.0 indicating the adolescent is more likely to take that specific action.

Means on this scale ranged from 3.54 to 1.30 and standard deviations ranged from 0.71 to 1.26. As can be seen, when it came to close friends, the response "Tell them to stop" (*M*=3.54) was the action that adolescents rated they were most likely to take. "Seek advice from a trusted adult in the community (e.g., church leader)" (*M*=2.57) was also an action that adolescents rated as being one they would likely take, although it was closer to a rating of "somewhat likely". The action "Talk to my parents" (*M*=2.22) fell between ratings of "somewhat likely" and "somewhat unlikely", but was closer to the latter. All other actions were not as highly endorsed, falling between "somewhat unlikely" and "extremely unlikely". Table 5 displays results from the PSARS-CM.

Table 5

Descriptive Statistics for the PSARS-CM (n=139)

Item #/Action	*M*	*SD*	% Selecting response			
			1	2	3	4
1.Tell them to stop	2.63	1.14	23.7	18.0	28.8	29.0
4. Do nothing	1.99	1.15	49.6	16.5	17.3	15.8
8. Talk to adult at school	1.97	1.19	53.2	12.9	15.8	17.3
6. Tell another peer	1.95	1.07	48.2	18.0	21.6	10.8
3.Talk to adult in community	1.93	1.14	51.1	16.5	14.4	15.1
9. Talk to my parents	1.88	1.17	56.8	14.4	10.8	17.3
2. Report to authorities	1.69	0.98	59.7	16.5	15.1	7.2
7. Call Help Line	1.57	0.94	67.6	14.4	10.1	7.2
10. Talk to friend's parents	1.50	0.94	73.4	9.4	9.4	7.2
5. Use with them	1.13	0.50	91.4	4.3	2.2	1.4

Note. Means can range from 1.0 to 4.0, with 1.0 indicating an adolescent is less likely to take that specific action, and 4.0 indicating the adolescent is more likely to take that specific action.

Means on this scale ranged from 2.63 to 1.13 and standard deviations ranged from 1.14 to 0.50. Again, the action adolescents rated they were most likely to take was "Tell them to stop" (*M*=2.63). All other actions were rated as falling between "somewhat unlikely and extremely unlikely."

Frequency of Adolescent Response to Peer Substance Use

To further examine the most common ways in which adolescents respond to discovering that a peer is using substances, frequency distributions were conducted on the data from the PSARS. For ease of comparing results of the PSARS-CM to PSARS-CF, the data from the four possible response options were combined into two responses, with responses of "extremely likely" and "somewhat likely" combined into "Likely", and responses of "somewhat unlikely" and "extremely unlikely" combined into "Unlikely". Table 6 displays these data by presenting the frequency and percentage of participants

that responded "Likely," providing data for both the PSARS-CF (close friend) and PSARS-CM (classmate). Responses are displayed in descending order for both scales.

Table 6

Frequency Distribution for "Likely" Actions on the PSARS (n=139)

Close Friend (PSARS-CF)			Classmate (PSARS-CM)		
Action	*N*	%	Action	*N*	%
Tell them to stop	123	89.1	Tell them to stop	80	58.0
Tell community adult	71	51.4	Do nothing	46	33.3
Tell my parents	56	40.6	Tell adult at school	46	33.3
Tell adult at school	49	35.8	Tell a peer	45	32.8
Tell a peer	40	29.4	Tell community adult	41	30.4
Tell friend's parents	37	27.0	Tell my parents	39	28.3
Call a helpline	37	27.0	Tell authorities	31	22.6
Tell authorities	25	18.1	Call a helpline	24	17.4
Do nothing	17	12.3	Tell friend's parents	23	16.7
Use with them	12	8.8	Use with them	5	3.6

Data revealed that the action reported to be the most likely to be taken on both the PSARS-CF and PSARS-CM was "Tell them to Stop", although the number of participants that indicated they were likely to take this action was considerably higher on the PSARS-CF (*n*=123) than on the PSARS-CM (*n*=80). The action "Do nothing" appears to be more likely if the peer is a classmate (*n*=46) than a close friend (*n*=17). On the other hand, the action "Use with them" appears to be more likely if the peer is a close friend (*n*=12) than a classmate (*n*=6).

It should also be noted that on the PSARS, many participants opted to utilize the "other" response, and wrote in unique responses. In all, 36 participants described unique responses when it was in regards to a close friend's substance use, and 20 participants commented when the situation involved a classmate. Additionally, with the exception of one ("tell them they are stupid"), all responses were rated as a 3 or 4, indicating it was

something the participant felt they were somewhat likely or extremely likely to do. The vast majority of comments involved trying to help the peer in some way, such as by talking to them about their problem (CF *n* = 21; e.g., "try to talk them out of doing it"; CM *n* = 8; e.g., "talk to them about it"), giving them information related to substance use (CF *n* = 6; e.g., "talk about consequences"; CM *n* = 5; e.g., "give them the right information"), finding them a hobby or something else to keep them away from drugs (CF *n* = 4; e.g., "find them something else to do"; CM *n* = 2; e.g., "give them another hobby"), or taking them to treatment meetings (CF *n* = 2; e.g., "bring them to meetings"; CM *n* = 0).

Principal Axis Factor Analysis

To determine the presence of any potential clustering of items, exploratory factor analysis was conducted. Prior to this, Items 4 ("do nothing") and 5 ("use with them") were reverse scored, as these items reflected negative actions and all other responses reflected positive actions. Once this was done, data from this sample were subjected to exploratory factor analysis, using the specific technique of principal axis factoring. Pattern matrices were examined, and in order to consider correlations between the factors, promax was selected as the method of factor rotation. In examining factor loadings, an absolute value of .30 or greater was considered to be significant, as this value is typically accepted in the research literature (Field, 2005).

On the PSARS-CF, two clusters were statistically supported. The first included all items except number six, and the second cluster included items one, five, and ten. Item six, "Tell another peer," therefore was not included in any of the clusters. Although items one, five and ten formed a statistically supported cluster, conceptually the items did not

group together, as they included the items “Tell them to stop”, “Use with them”, and “Talk to my friend’s parents”. To determine reliability for each cluster, Cronbach alpha coefficients were calculated. Reliability for the first cluster, including all items but six, was .86, and for the second cluster (items one, five, and ten) was .60.

On the PSARS-CM two clusters were again statistically supported, the first including items two, three, seven, eight, nine, and ten, and the second including items one, four, and five. Item six again did not align with any other items. Conceptually, the first cluster consisted of items related to telling someone, and the second cluster included the action “Tell them to stop”, as well as the reverse scored options “Do nothing” and “Use with them”. Cronbach alpha coefficients were calculated for both clusters, with the first cluster resulting in a coefficient of .84, and the second cluster resulting in a coefficient of .75.

The overall reliability was also calculated for both the PSARS-CM and PSARS-CF. The PSARS-CF yielded a coefficient of .83, while the PSARS-CM yielded a coefficient of .83. On both scales, item six (“Tell another peer”) was determined to decrease reliability of the scale. With the deletion of this item, the coefficient on the PSARS-CF was increased to .86, and the PSARS-CM to .85. Based on this, all further analyses with the composite variable included all item with the exception of item number 6 (“Tell another peer”). Overall, all items on the PSARS-CF correlated significantly with each other, with the exception of item number six, which did not correlate with any other items. Regarding intercorrelations among items on the PSARS-CM, again item six did not correlate with any other item. Additionally, item five did not have significant correlations with any other item except item numbers one and four.

Overall reliability for the composite variable from both the PSARS-CF and PSARS-CM was therefore higher than reliability for any individual cluster on either scale. Considering this, in combination with the fact that the two scales did not present with similar clusters, it was determined that an overall composite score would be calculated for each scale. This overall score was formed by calculating an average score for the set of items (with items four and five being reverse scored) except item six. This was done separately for the PSARS-CF and PSARS-CM, resulting in two separate new variables for each participant, each variable representing an overall value for its respective scale; in other words, total scores reflect the likelihood of taking any action(s) after learning of a close friend or classmate's substance use. The PSARS-CF overall was found to correlate with each individual item on the scale, with the exception of item six. The PSARS-CM overall score also correlated with each individual item on its corresponding scale, again with the exception of number six. Descriptive statistics were calculated for each of the new variables. The mean score for the overall value on the PSARS-CF was 2.54, while the mean score on the PSARS-CM was 2.23. This indicates that a positive action of some sort was more likely to be taken on the PSARS-CF than on the PSARS-CM.

Differences between Responses on the PSARS-CF and PSARS-CM

To determine if differences between responses on the PSARS-CF and PSARS-CM were statistically significant, paired T-test analyses were conducted in order to compare the mean responses on each item regarding a classmate's substance use versus a close friend's substance use. Thus, average scores on each item on the PSARS-CF were compared to the corresponding item on the PSARS-CM. Table 7 displays these results.

Table 7

Paired t-tests Comparing Items and Total Score on PSARS-CF to Items and Total Score on PSARS-CM

Item	*N*	Mean Diff.	*t*	df	*r*
1. Tell Them to Stop	138	0.91	10.88	137	*0.52
2. Report to Authority	137	-0.07	-1.08	136	0.64
3. Seek Help from Comm. Adult	135	0.63	6.62	134	*0.55
4. Do Nothing	138	-0.57	-6.00	137	*0.41
5. Use with Them	136	0.17	3.57	135	*0.64
7. Call a Help Line	137	0.26	3.60	136	*0.66
8. Seek Help from School Adult	137	0.04	0.46	136	0.69
9. Talk to my Parents	138	0.34	3.67	137	*0.60
10. Talk to Peer's Parents	137	0.36	4.55	136	*0.58
Overall Mean Scores	138	0.32	7.48	137	*0.75

Note. * $p<.01$. Positive mean differences indicate that the action was more likely to be taken for a close friend as compared to a classmate.

Results revealed that students were more likely to report items one, three, five, seven, eight, nine, and ten, if the situation involved a close friend, and more likely to report item two and four if the situation involved a classmate. Additionally, with the exception of item two ("Report to authority") and eight ("Call a teen Help Line"), all differences between items were statistically significant, indicating that participants did respond to the items differently based on if the action was being taken in response to a close friend or classmate's substance use. In examining the correlations between each individual item on the PSARS-CF and the corresponding item on the PSARS-CM (e.g., comparing item one on the PSARS-CF to item one on the PSARS-CM), all items yielded a significant, positive correlation. In addition, the PSARS-CF overall score and the PSARS-CM overall score also yielded a significant, positive correlation.

Correlational Analyses

To examine the relationships between the clusters on the TADUS (alcohol, cigarettes, and marijuana), and individual item on the PSARS, as well as overall composite scores on the PSARS, Pearson correlation coefficients were calculated. Intercorrelations are presented in Table 8.

Table 8

Correlations between PSARS Scores and Substance Clusters on TADUS (n=137)

Item	Alcohol Use	Cigarette Use	Marijuana Use
1. PSARS-CF #1	**-0.25	**-0.38	**-0.43
2. PSARS-CF #2	**-0.33	*-0.21	**-0.33
3. PSARS-CF #3	*-0.17	**-0.27	**-0.42
4. PSARS-CF #4	*0.18	**0.24	**0.34
5. PSARS-CF #5	**0.34	**0.44	**0.65
6. PSARS-CF #6	0.11	0.02	-0.09
7. PSARS-CF #7	-0.11	**-0.24	**-0.25
8. PSARS-CF #8	**-0.23	**-0.24	**-0.25
9. PSARS-CF #9	*-0.21	**-0.25	**-0.29
10. PSARS-CF #10	*0.18	**-0.29	**-0.31
11. PSARS-CM #1	**_0.25	**-0.33	**-0.31
12. PSARS-CM #2	-0.16	**-0.23	**-0.25
13. PSARS-CM #3	*-0.20	**-0.25	**-0.30
14. PSARS-CM #4	**0.28	0.07	*0.18
15. PSARS-CM #5	0.15	**0.35	**0.39
16. PSARS-CM #6	0.15	-0.03	-0.05
17. PSARS-CM #7	-0.13	*-0.19	-0.14
18. PSARS-CM #8	-0.15	**-0.22	**-0.27
19. PSARS-CM #9	*-0.20	**-0.22	*-0.19
20. PSARS-CM #10	-0.10	*-0.18	**-0.23
21. CF TOTAL	**-0.31	**-0.39	**-0.50
22. CM TOTAL	**-0.27	**-0.31	**-0.34

Note: *p<.05. **p<.01

Regarding relationships between items on the PSARS-CF and substance use clusters, items one, two, three, seven, eight, nine, and ten, as well as the PSARS-CF overall score, all correlated negatively with the alcohol, cigarette, and marijuana clusters

(except for item seven, which was significantly associated with cigarettes and marijuana but not alcohol). These findings were all as expected, and show that higher scores on each of these PSARS-CF items correlates with lower levels of personal substance use. Items four and five both yielded positive correlations with the alcohol, cigarette, and marijuana clusters. These findings are also as expected, given that item four (do nothing) and five (use with them) are both considered negative (problematic) responses.

Examining correlations between items on the PSARS-CM and substance use clusters, a somewhat similar pattern occurred for cigarette use – items one, two, three, seven, eight, nine, and ten were all found to have negative correlations, item five yielded a positive correlation, and items four and six were not related to cigarette use. Marijuana use also showed a somewhat similar pattern, with items one, two, three, eight, nine, and ten showing a negative correlation, items four and five a positive correlation, and items six and seven no correlation. When it came to alcohol use, only items one, three, and nine yielded negative correlations, while item four showed a positive correlation. The remaining items (two, five, six, seven, eight, and ten) were not significantly associated with alcohol use. The PSARS-CM overall score yielded significant, negative correlations with all three of the substance use clusters.

Predicting Students' PSARS Responses from their Personal Qualities

Multiple regressions were carried out to examine the relationships between responses on the PSARS and demographic variables, as well as own use of substances. Prior to this, dummy-coded variables were created for the variable race, which allowed for the variables African American, Hispanic, and Other to be compared to the variable White/Caucasian. Next, independent variables were assessed for multicollinearity, which

occurs when strong correlations exist between the variables. The existence of mutilcollinearity is undesirable, as it can limit significant findings, can lead to inaccurate regression coefficients, and can therefore result in false conclusions regarding the results of the regression. To ensure multicollinearity did not exist, a correlation matrix including all independent variables was examined. Correlations ranged from -.59 to .56, and were therefore not strong enough to suggest the presence of multicollinearity.

Next, separate multiple regressions were run to determine the presence of any interactions between demographic variables. Separate analyses were run using both the total score for the PSARS-CF and the PSARS-CM as dependent variables, and exploring interactions including: gender by race, gender by SES, grade level by race, and grade level by SES. No interactions were found, and therefore multiple regressions using only main effects were then carried out.

As with the interaction multiple regressions, separate analyses were carried out for each PSARS subscale, first using the PSARS-CF overall score as the dependent variable, and then using the PSARS-CM overall score as the dependent variable. Both analyses included the same predictor variables: gender, grade, free/reduced lunch, African American ethnicity, Hispanic ethnicity, other ethnicity, use of alcohol, use of cigarettes, and use of marijuana. The regressions for both the PSARS-CF and PSARS-CM involved two models, the first including only the demographic variables (gender, grade, SES, and ethnicity), and the second with the addition of the participants' personal substance use variables (alcohol use, cigarette use, and marijuana use).

When the PSARS-CF overall score was used as the dependent variable, model one (demographic variables only) explained 4.6% of the variance. No single demographic

predictor variable was found to account for any significant amount of variance. Model two (demographic variables and substance use variables) explained 34% of the variance. Only two variables, Free/Reduced Lunch and Marijuana Use, accounted for a significant amount of the variance. The mean overall score on the PSARS-CF for participants who reported receiving free or reduced price school was 2.6, and was 2.4 for those participants who did not receive free lunch. Regarding marijuana use, the mean overall score on the PSARS-CF was 1.8 for those participants that reported using marijuana within the past year, and 2.7 for those who denied that they used marijuana. Both Free/Reduced Lunch and Marijuana Use showed a negative association with the PSARS-CF overall score. Thus, those participants who indicated they received free/reduced lunch were more likely to report that they would take any kind of positive action in response to a close friend's substance use. Additionally, those participants who reported using marijuana were less likely to report that they would take any positive action in response to a close friend's substance use. The results of these analyses are reported below, in Table 9.

Table 9

Regression of PSARS-CF Overall Score on Predictor Variables (n=137)

Model	Predictor	*b*	SE	Beta	R^2	Adjusted R^2
1	Constant	*** 2.279	.584	---	.046	.001
	Gender	.169	.134	.109		
	Grade	.023	.049	.040		
	Free/Reduced Lunch	-.197	.132	-.133		
	African American	.312	.238	.130		
	Hispanic	.182	.157	.133		
	Other Ethnicity	.120	.208	.061		
2	Constant	*** 2.645	.494	---	.340	.293
	Gender	.194	.113	.126		
	Grade	.031	.042	.055		
	Free/Reduced Lunch	* -.279	.113	-.188		
	African American	.129	.202	.055		
	Hispanic	.109	.133	.079		
	Other Ethnicity	-.126	.178	-.064		
	Alcohol Use	-.183	.113	-.134		
	Cigarette Use	-.178	.164	-.098		
	Marijuana Use	*** -.728	.158	-.426		

Note. *$p < .05$. ** $p < .01$. *** $p < .001$. Gender is coded such that "0" indicates male and "1" indicates female. Free/Reduced Lunch is coded such that "1" indicates yes, free/reduced lunch is received (representative of lower SES), and "2" indicates no, free/reduced lunch is not received (representative of higher SES)

When the PSARS-CM overall score was used as the dependent variable, model one (demographic variables only) explained 7.5% of the variance. Free/Reduced Lunch was the only demographic predictor variable found to account for any significant amount of variance. The mean overall score on the PSARS-CM for participants who reported receiving free or reduced price school was 2.3, and 2.0 for those who did not receive free or reduced price lunch. This association was negative, which indicates that participants with lower SES were more likely to report that they would take any positive action in

response to a classmate's substance use. Due to the significant findings regarding the effect of SES on PSARS-CM scores, post hoc tests were conducted. Specifically, to determine if differences occurred in specific responses to classmate substance use based on SES, paired sample *t*-tests were conducted in order to statistically compare the mean differences responses on each item on the PSARS-CM between the two groups (adolescents that reported receiving free/reduced priced school lunch, and those that did not). Findings revealed that the differences between SES groups' mean scores on individual items reached statistical significance for every item, however the item that clearly showed the biggest difference was item one (tell them to stop; t=12.45, df=136). Those participants that did receive free/reduced priced school lunch had a mean score of 2.62 on this item, while those that did not had a mean score of 1.30.

Model two (demographic variables and substance use variables) explained 22.3% of the variance. Two variables, Free/Reduced Lunch and Marijuana Use, accounted for a significant amount of the variance. Regarding marijuana use, the mean overall score on the PSARS-CM was 1.7 for those that reported using marijuana within the past year, and a 2.3 for those who denied using marijuana. For both Free/Reduced Lunch and Marijuana Use, the associations were negative, therefore the association SES has the same interpretation as previously discussed, and those participants who indicated they used marijuana were less likely to report that they would take any positive action in response to a classmate's substance use. The results of these analyses are reported in Table 10.

Table 10

Regression of PSARS-CM Overall Score on Predictor Variables (n=137)

Model	Predictor	B	SE	Beta	R^2	Adjusted R^2
1	Constant	*** 2.464	.588	---	.075	.032
	Gender	.146	.135	.092		
	Grade	.003	.050	.006		
	Free/Reduced Lunch	* -.328	.133	-.216		
	African American	.433	.239	.176		
	Hispanic	-.029	.158	-.020		
	Other Ethnicity	.122	.210	.061		
2	Constant	*** 2.737	.548	---	.223	.168
	Gender	.157	.125	.099		
	Grade	.010	.047	.017		
	Free/Reduced Lunch	** -.380	.126	-.250		
	African American	.310	.224	.126		
	Hispanic	-.074	.147	-.052		
	Other Ethnicity	-.047	.198	-.023		
	Alcohol Use	-.178	.126	-.127		
	Cigarette Use	-.221	.182	-.119		
	Marijuana Use	* -.421	.180	-.241		

Note: *$p < .05$. ** $p < .01$. *** $p < .001$. Gender is coded such that "0" indicates male and "1" indicates female. Free/Reduced Lunch is coded such that "1" indicates yes, free/reduced lunch is received (representative of lower SES), and "2" indicates no, it is not received (representative of higher SES)

Chapter Five

Discussion

Study Summary

The purpose of the current study was to examine the relationships that exist between adolescents' demographic characteristics and their substance use, and adolescents' responses to discovering that a peer is using substances. Additionally, this study investigated how adolescents' gender, ethnicity, socio-economic status, grade level, and own use or non-use of substances related to the actions the adolescents felt they would take in response to discovering that a peer is using substances. In addition, this study examined whether an adolescent's relationship with the peer using substances (i.e., close friend versus classmate) was related to the actions taken by the adolescent in response to the peer's substance use.

This chapter will include a discussion on results from the current study, with notable findings emphasized, and will compare the current findings to relevant existing literature. Implications of the findings will then be provided, followed by a discussion of limitations of the study. This chapter will then conclude by offering directions for future research.

Findings Regarding Frequency of Substance Use

When looking at rates of substance use for each individual substance, the majority of high school students in the current study reported use on zero occasions. Of the

exceptions, the most commonly used substances included: wine/wine coolers (45.3%), liquor (38.8%), beer (33.8%), prescription drugs that were prescribed to the student (22.3%), marijuana (19.4%), and cigarettes (16.5%). The remaining substances (i.e., illicit drugs, chewing tobacco, etc.) were endorsed by approximately 10% or less of the sample. The somewhat elevated number of participants endorsing the use of prescription drugs that were prescribed to them was higher than expected, and not of central focus to the current study (e.g., using your own prescription drugs as prescribed is not considered "substance use" by most researchers, whereas use of any other substance included on the TADUS is viewed as "substance use").

When alcohol use was conceptualized as use of any alcoholic beverage (rather than liquor, wine, or beer alone), over half (55.4%) of participants were classified as drinkers within the past 12 months. Previous research examining alcohol use in adolescence found that 52.5% of tenth grade students, and 65.5% of twelfth grade students reported consuming alcohol within the past year (Johnston et al., 2007). Rates from the current study are therefore fairly consistent with previous research, particularly considering the current sample was comprised of students in grades 9 through 12.

The next most commonly endorsed substance was marijuana, which 19.4% of students in the current study reported having used within the past 12 months. This rate was slightly lower than previous research has indicated. For example, Johnston et al. (2007) found that within the past year 23.9% of tenth grade students and 32.4% of twelfth grade students reported using marijuana. One hypothesis for this discrepancy may be the predominantly Hispanic population that was used for the current study. Research indicates that overall, Hispanic students tend to show lower rates of substance use as

compared to White students (Johnston et al. 2007). Only approximately 20% of the students in the current study reported their ethnicity to be White, while nearly 60% reported that their ethnicity was Hispanic. Based on this, it would be expected that rates of substance use in this sample would be somewhat lower than typically found in nationwide studies with representative samples of youth. Additionally, the active consent procedures used in the current study to enroll student participants may have resulted in participation from a subgroup of youth that was unique in some way, perhaps in rate of substance use. This hypothesis is in line with results of prior research on active versus passive consent procedures in school-based surveys of student substance use. Specifically, White, Hill, and Effendi (2004) found that rates of marijuana use obtained from samples that were enrolled via passive consent procedures were significantly higher than rates of marijuana use reported by samples enrolled via active consent procedures.

Finally, cigarette use was endorsed by 16.5% of participants. Compared to previous research, this rate was considerably lower. For example, Johnston et al. (2007) found nearly double this rate for students in tenth grade (31.7%), and almost triple this rate for students in twelfth grader (44.7%). These discrepant findings may again be attributable to either the predominantly Hispanic population used for the current study or response bias associated with the sample obtained via active consent procedures.

Findings Regarding Adolescent Response to Peer Substance Use

Close friend substance use. Students' average response to the items on the PSARS-CF corresponded to right in-between a rating of 2, indicating "somewhat unlikely" and 3, indicating "somewhat likely". When looking at responses to individual items, the action that participants reported they would be most likely to take was to tell

the close friend to stop using substances. When considering all responses of "extremely likely" or "somewhat likely" to indicate the adolescent would likely take that action, the vast majority of participants responded that they would be likely to take this action. The next most commonly endorsed responses all involved telling someone about the close friend's substance use or seeking help from someone. Of these, seeking advice from a trusted adult in the community (e.g., church leader) was the most common response, and was endorsed by over half of participants. Other somewhat popular responses, as indicated by over a quarter of participants responding they would likely take this action, included: talking to their own parents, seeking help from an adult at school such as a teacher or guidance counselor, telling another peer, and finally talking to the parents of the close friend that was using substances. Calling a helpline was also endorsed by just over a quarter of participants. The remainder of responses were endorsed by few (under a quarter) participants. Telling authorities, for example the police, was seen as more favorable than only doing nothing and using with the close friend.

In the Tisak, Tisak, and Rogers (1994) study, predominantly White high school students from mixed SES backgrounds were surveyed as to how they would respond to peer substance use. Students in this study were asked to reply "yes", "no", or "uncertain" as to whether they felt they would discuss the substance use with the peer and whether they felt they would report the use to authorities. Eighty four percent of participants reported that they would discuss a peer's substance use with that peer, while 16% reported that they would report the substance use to authorities. The findings from the current study are very comparable, suggesting that Tisak, Tisak, and Rogers' (1994)

findings with high school students are applicable when the peer using substances is a close friend.

Classmate substance use. On the PSARS-CM, the average overall score for this scale was slightly above a 2, which corresponded to a rating just above "somewhat unlikely". In looking at endorsed individual responses, the only response endorsed by the majority of participants was telling the peer to stop using substances. Of the remainder of responses, the most popular (endorsed by more than a quarter of participants), included doing nothing, seeking help from and adult at school, telling another peer, seeking help from an adult in the community, and talking to their own parents. Less likely responses (endorsed by less than a quarter of participants), included telling authorities, calling a helpline, and talking to the classmate's parents. The least likely action that was reported to be taken was using with the classmate.

When comparing these results to the previously discussed Tisak, Tisak, and Rogers (1994) study, findings appear to differ. In the present study, only 58% of participants reported that they would likely try to stop their classmate from using substances, while Tisak, Tisak, and Rogers (1994) study found that 84% of participants would discuss the substance use with the peer. Additionally, this study found that 23% would report their classmate's substance use to authorities, while Tisak, Tisak, and Rogers (1994) found that a slightly lower 16% would do so for a peer. One hypothesis for these discrepant results is that the Tisak, Tisak, and Rogers (1994) study used the term "peer," while the current study used the term "classmate". It may be that when asked about substance use in relation to a "peer," adolescents may interpret this term as

meaning more of a friend than simply a classmate. When students think of classmates, they are apparently much less likely to intervene directly.

Indeed, students in the current study reported a higher likelihood of taking a positive action of some sort if the peer using substances was a close friend than a classmate. Regarding specific actions to be taken, more students would tell a close friend to stop using substances than tell a classmate the same thing. Unfortunately, students would also be more likely to use substances with a close friend than with a classmate. When it came to telling someone or seeking help from someone, students in the current study were more likely to take the following actions for a close friend than for a peer: seek advice from a trusted adult in the community, talk to their own parents, or talk to the friend's parents. A similar (small) proportion of students reported they would seek help from an adult at school (e.g., teacher, guidance counselor), and/or would tell authorities, regardless if the substance use was on the behalf of a close friend or for a classmate. It seems that overall adolescents are more likely to seek help from a trusted adult for a close friend using substances than for a classmate using substances. Calling a helpline emerged as a fairly unpopular response, regardless of the peer being a close friend or classmate. Finally, an important finding was that far more students reported they would likely do nothing if the user was a classmate rather than a close friend.

How an adolescent responds to a close friend's substance use in comparison to a classmate's substance use has not been explored in existing research; therefore, results from the current study cannot be compared to results from other studies. Existing literature does suggest that an adolescent's own substance use is influenced more by a close friend than by any other peer (Urberg, et al. 1997). Findings from the current study

appear to agree with this, as more students reported that they would use substances with a close friend than with a classmate. However, the current study also presents with more positive findings, specifically, that using with the close friend was actually the least likely response. Adolescents reported that they would be more likely to tell the friend to stop, seek help from an adult, call a helpline, etc., than to use with the peer. On another positive note, the same held true for classmates – using substances with the classmate was the action that the fewest adolescents endorsed. Additionally, it should be kept in mind that a sizable number of participants utilized the "other" item to note a positive action they would take (generally talking to the peer in an attempt to help them quit); however, these responses were not accounted for in data analysis. The overall likelihood a student would take a positive action of some sort in response to peer substance use would likely have been even higher had these responses been factored in.

Associations among Student Demographic Characteristics, Personal Substance Use, and Response to Peers' Substance Use

Correlations obtained in the current study indicated that students who used one substance were likely to use another. Specifically, the strongest (positive) relationship was found between marijuana and cigarette use.

Similarly, patterns were evidenced between students' specific likely responses to peer substance use and their own personal substance use. For instance, students who used alcohol themselves were more likely to report they would take negative actions after learning of a close friend's substance use, such as do nothing or use with the close friend. On the other hand, students who used alcohol were *less* likely to respond to learning of a close friend's substance use by taking any positive action, including, telling them to stop,

reporting their use to an authority, seeking advice from a trusted adult in the community, calling a teen help line, seeking help from an adult at school, talking to their own parents, talking, and talking to the friend's parents. The same pattern of relationships existed when students were either personal cigarette and/or marijuana users, with one exception – they were not found to be any less likely to take the positive response of calling a teen help line than adolescents who were not cigarette and/or marijuana users. Interestingly, students' personal substance use had the most adverse impact on their likelihood of responding to peers' substance use when the student was a marijuana user. Weaker associations were yielded between personal alcohol use and likelihood of taking a positive action after learning of a close friend's use.

In comparison, fewer significant links were found between responses to a classmate's substance use and one's own substance use. This was mostly due to the limited amount of significant links found between one's own alcohol use and response to peer substance use. For instance, students' personal use of alcohol was unrelated to their tendency to respond to a classmate's substance use in any of the following ways: report use to authority, use with them, tell another peer, call a teen help line, seek help from an adult at school, and talk to the peer's parents. Those students who were personal alcohol users were more likely to report that they would do nothing in response to a classmate's substance use. However, these alcohol users were also less likely to take the positive actions of telling the classmate to stop, seeking advice from a trusted adult in the community, and talking to their own parents.

The pattern of relationships that existed between being a personal marijuana and/or cigarette user and responses taken to classmate substance use was similar to those

found for close friend use. For both personal marijuana and cigarette users the strongest relationship was with their positive likelihood of using substances with the classmate. Students' personal use of marijuana was related to reporting that they would do nothing, whereas personal use of cigarettes showed no relation. On the other hand, personal use of marijuana was found to have no relation with calling a teen help line, whereas personally using cigarettes was related to a decreased likelihood of taking this action. Students who reported personal use of marijuana and/or cigarettes were less likely to take any of the remaining positive responses. Again, students' personal substance use had the most adverse impact on their likelihood of responding to classmates' substance use when the student was a marijuana user. Weaker associations that were not significant once personal marijuana use is taken into account were yielded between personal alcohol or cigarette use and likelihood of taking a positive action after learning of a classmate's use. However, these substance-based differences were not as pronounced as those found when the peer was a close friend.

In sum, findings from the current study suggest that in most cases, a relationship exists such that an adolescent who does not use substances is more likely to take a positive action(s) in response to a peers' substance use. This relationship appears to be somewhat stronger when the peer is a close friend as opposed to a classmate.

An interesting finding in the current study was that the response "tell another peer" was not related to anything, including other responses on the scale or own personal use of substances. Given that adolescence is known to be a period during which friendships and peer relations become of increasing importance (Berk, 2006), it would seem that telling another peer would be a likely response to discovering that a close

friend or classmate is using substances. One hypothesis for this not holding true is that the item was poorly worded. To some, telling another peer may mean looking to a peer for support and help with handling the situation, whereas to others it may mean gossiping and spreading rumors. The multiple interpretations of "tell another peer" likely lead to the results of this item being un-interpretable and meaningless. Thus, the null results obtained with this item in the current study could be due to the vague and ambiguous nature of the item content, rather than an accurate representation of the intended sentiment of that item.

Predicting an Adolescents' Response to Peers' Substance Use

In the current study, demographic characteristics such as ethnicity and gender accounted for very little of the variance in adolescent responses to a close friend's substance use. In some analyses, however, SES appeared linked with how an adolescent would respond to a close friend's substance use. Specifically, students who qualified for free/reduced price school lunch reported a higher likelihood of taking any positive action in response to a close friend's substance use. However, this finding was not consistent, as it only emerged in analyses in which substance use variables were also included in the model.

Regarding response to a classmate's substance use, demographic characteristics again accounted for little variance in adolescent responses to classmate substance use. However, with classmates, it was found that students who received free/reduced price school lunch did report a higher likelihood of taking any positive response to a classmate's substance use. This finding was consistent regardless of whether substance use variables were included in the model or not, but was a fairly weak predictor. This finding therefore suggested that adolescents from lower SES families were in fact more

likely to take a positive action in response to a peer's substance use. One hypothesis for this is that children from lower SES families have developed stronger negative opinions against substance use than children from higher SES families. For example, Quiroga (2000) found that children of lower SES endorsed stronger negative attitudes towards alcohol, whereas children of higher SES endorsed more flexible attitudes. Additionally, these findings may be due to the specific population used for this study, and the associated lower rates of substance use typically found within this population (i.e., low SES, minority youth). For instance, earlier research explored substance use rates among small predominantly White schools, larger high-SES predominantly White schools, and larger low-SES predominantly minority schools. Findings indicated that the latter population, which describes the population used in the current study, showed the lowest substance use rates (Skager & Fisher, 1989).

In contrast to the relatively weak and inconsistent links between student demographic characteristics and response to a close friend's substance use, students' personal use of substances accounted for almost 30% of the variance in their reports of responses they would be likely to take after learning of a close friend's substance use. Of the three substance use variables, use of marijuana was the strongest predictor of their response to peer substance use. This association was negative, such that a higher likelihood of taking some positive action in response to close friend's substance use was reported by students who did not use marijuana in the past year.

Personal substance use accounted for approximately 15% of the variance in how a student would respond to a classmate's substance use. Again, marijuana use drove this relationship such that participants who reported a higher likelihood of taking some

positive action in response to a classmate's substance use did not use marijuana themselves in the past year.

Implications

Substance use in adolescence is associated with a number of undesirable outcomes, such as an increased risk for the development of a substance use disorder (Dewit, Adlaf, & Offord, 2000), toxin exposure to the CNS that can result in inferior language skills and impaired frontal lobe functioning (Moss et al., 1994), a decreased sense of good judgment (Weschler et al., 1994), and decreased academic achievement (Abdelrahman, Rodriguez, & Ryan, 1998). Additionally, research has reaffirmed that there is a social aspect to adolescent substance use, such that when an adolescent's peers use drugs, the adolescent is provided with a model of drug use, more opportunities and easier access to drugs, and norms that approve of drug-use behavior (Oetting & Donnermeyer, 1998).

As so many clear negative outcomes exist, it is important for mental health professionals and educators to be knowledgeable regarding how to deal with adolescent substance use. The social aspect of adolescent substance use makes it clear that an adolescent is influenced by peer substance use. One way to deal with substance use among adolescents is therefore to explore how an adolescent responds to peer substance use. Knowing the actions an adolescent takes following the discovery that a peer is using substances can help us ensure that appropriate resources are available to the adolescent. The current study examined just that – the exact responses that adolescents felt they would take in response to peer substance use. One issue with exploring an adolescent's response to peer substance use is that the term "peer" is fairly vague. Therefore this study

examined adolescent response to substance use of two different types of peers – close friends and classmates.

The current study found that the action adolescents reported they would most likely take in response to either a close friend or a classmate's substance use was to tell the peer to stop. Additionally, qualitative responses from numerous students suggest that many student would also try to talk to the peer in a way that provides help (e.g., by giving them information and consequences on substance use, talking to them reasonably). This indicates that adolescents were most likely to deal with the substance use themselves, and suggests a need for educating adolescents on how to handle a peer's substance use in terms of advice offered to friends, as well as how to ensure effective interactions during such confrontations. For example, universal training that provides adolescents with resources (AA, rehab programs, counselors at school or in the community, etc.) would be beneficial in helping adolescents know how to help their peer. If an adolescent chooses to deal with the peer's substance use by talking to the peer, he/she needs to be well educated on substance use in order to help the peer to the best of his/her ability.

A second important finding is that when the peer is a classmate, the next most likely response is to do nothing. This is of concern to adolescents who do not have many close friends, as it may be that no teenagers will intervene on their behalf. Educators and other adults can attempt to develop relationships with those students who do not appear to have many friends, and can be responsible for intervening when there is concern that the student may be using substances. Also, all high school students should be educated on the importance of informing an adult of a peer's substance use, regardless of how close they feel they are to that peer.

For both close friends and classmates, fairly popular responses included telling an adult, whether that be someone in the community (e.g., church leader), a parent, or an adult at school (e.g., teacher, counselor). This demonstrates a need for adult education related to effective responses to being informed of an adolescent's substance use. Teachers, coaches, parents, church congregations, etc., can all be provided with substance use education classes that are aimed at providing them with the skills and resources to deal with an adolescent who is using substances, in part to ensure students are routed to the appropriate mental health care providers (e.g., substance use counselors).

Interestingly, calling a teen help line was not a popular response regardless of whether the peer using substances was a close friend or classmate. This shows that simply providing adolescents with a phone number to call is not a particularly useful option, as they are unlikely to use the number. Additionally, this finding reiterates the previously discussed importance of educating both adults and students regarding how to handle peer substance use.

One last noteworthy finding was that overall, students reporting personal use of alcohol, marijuana, and/or tobacco were less likely to take positive actions in response to peer substance use (e.g., seek help from an adult, tell the peer to stop), and were in fact more likely to take negative actions (e.g., do nothing, use with the peers). This suggests a strong need for preventative measures against drug use, as it implies that once students begin using substances they become less likely to stop peers from using. Furthermore, it again emphasizes the need for adults and students to be educated in dealing with a peer who uses substances – for an adolescent who continues to use substances does not appear to be likely to assist in efforts to attempt to stop others from using substances.

Limitations

Several limitations exist in regards to the current study. To begin, results from this study may not be able to generalize to all populations. The population used for this study is a low-SES, predominantly Hispanic high school, and consisted of mostly females. As this is one specific population, adolescents in different populations may take different actions in response to discovering that a peer is using substances. Additionally, the sample that was used was small in number, and excluded non-English speaking students. This exclusion does not allow for examination of the effect of acculturation.

A second issue is that the measures used for this study were new, and therefore did not have preexisting data that supported their psychometric properties. Despite a pilot study, it was evident that not all items on the PSARS were clearly understood by participants. Specifically, "tell another peer" decreased the reliability of the scale and was therefore not utilized in most analyses. Also, "tell them to stop" was the only item that mentioned directly talking to the peer using substances. Another item focusing on talking to the peer using substances in a way that provides help (explaining consequences, attempting to talk them into attending substance support groups, etc.) would have been beneficial. Additionally, this scale allowed for only the measure of how adolescents responded to peer substance use overall, and not in relation to use of individual substances (i.e., alcohol, marijuana, tobacco). Measures used in this study were self-report, which allows for a measure of only an adolescent's perceptions, which may vary from their true actions.

Directions for Future Research

Results from the current study are a start to understanding how adolescents respond to peer substance use. Future research on this topic should explore different populations, for example adolescents from higher SES families, adolescents from differing ethnic groups, and populations that include significantly more males. This study was completed with only high school students, but future research may explore middle school and college populations. Additionally, future research should be conducted with non-English speaking populations in order to explore issues related to acculturation.

Finally, replications of this study should consider adapting the PSARS to measure response to specific drug use as opposed to overall drug use. For example, how an adolescent responds to a peer's alcohol use, to a peer's marijuana use, and to a peer's tobacco use. Future use of the PSARS should include the removal of item six, "tell a peer". Further research could explore replacing this item with two separate items, one a positive response related to seeking help and advice from another peer, and the other a negative response related to gossiping about the peer that uses substances. While the current study is a start to understanding adolescent response to peer substance use, future research will be able to add valuable information to this topic.

Further research on this topic will help to develop preventions and interventions for adolescent substance use. Once there is a full understanding of how adolescents respond to peer substance use it will be easier to ensure that the proper resources are in place. Research can then shift to discovering how best to educate adolescents in dealing with peer substance use, and in preparing adults to handle adolescents that come to them with this problem.

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Appendices

Appendix A: Parental Consent Form, Spanish Version

Estimados padres:

Esta carta es para informarles sobre un estudio investigativo que será realizado el la Escuela Secundaria de Leto. Los investigadores de la Universidad del Sur de la Florida (USF) están tratando de averiguar los efectos que tienen las experiencias en la escuela, la casa y con amistades sobre la salud y el bien psicológico de los alumnos.

Quiénes somos?: El equipo de investigación consiste del doctor Rance L. Harbor, psicólogo para el Condado Escolar de Hillborough y profesor visitante de la Universidad del Sur de la Florida (USF) y también consiste de estudiantes licenciados en el Programa de Psicología en la Universidad del Sur de la Florida (USF). Estamos planeando este estudio investigativo en cooperación con el director de la Escuela Secundaria de Leto para poder asegurar que la información obtenida beneficia a la escuela.

Por qué estamos solicitando la participación de su hijo/hija? Este estudio es parte de un proyecto titulado **"Riesgos y factores protectivos asociados con usos de sustancias entre alumnos en escuelas secundarias."** Su hijo/hija fue seleccionado porque es un alumno/alumna de la Escuela Secundaria de Leto.

Por qué su hijo/hija debe de participar? Necesitamos aprender más sobre las razones que atraen a la juventud al uso del alcohol y las drogas cuando están en la escuela secundaria. La información que recibimos de los alumnos puede que nos ayude a entender mejor nuestro conocimiento de los factores peligrosos que atraen a los alumnos al uso del alcohol y las drogas. A propósito, también nos dará la oportunidad de mejor entender nuestro conocimiento sobre las características y las actividades que sirven como factores protectivos en prevenir el uso del alcohol y las drogas. Además, la información que logremos obtener de los alumnos será repartida entre los maestros y la administración de la Escuela Secundaria de Leto para que estén al tanto de experiencias específicas que ocurren en la escuela que resultan en la salud y el bien psicológico de los alumnos. Ninguno de los alumnos ni sus padres serán compensado por su participación en este estudio investigativo. Sin embargo, todos los alumnos que participen en este estudio investigativo tendrán la oportunidad de ganar uno de varios premios en una rifa.

Los requisitos para participación: Si su hijo/hija tiene permiso para participar en nuestro estudio se le entregará varios cuestionarios de papel y lápiz los cuáles tendrán que responder. Estos cuestionarios se tratan de los pensamientos, el comportamiento y la actitud de su hijo/ hija sobre el uso del alcohol y las drogas; también tendrán preguntas sobre la participación de su hijo/hija en programas y actividades fuera de la escuela, sobre su participación en deportes, sobre las amistades y relaciones que mantienen con sus compañeros, y sobre la salud y el bien psicológico. Está estimado que le tomará entre media hora y 45 minutos para llenar los cuestionarios. Personalmente distribuiremos los cuestionarios a los alumnos durante las horas de escuela en el segundo semestre escolar (los meses de invierno y primavera). Estos cuestionarios se le darán a los estudiantes que tengan permiso para participar en nuestro estudio; estos alumnos serán divididos en varios grupos. En total, es estimado que la participación de su hijo/hija tomara no más de una hora durante un día de escuela.

La privacidad de las respuestas de su hijo/hija: Hay un riesgo mínimo en la participación de su hijo/hija en este estudio. Nosotros estaremos presentes durante la administración de los cuestionarios para poder asistir a su hijo/hija por si acaso tienen algunas preguntas o preocupaciones. En cuanto su hijo/hija termina el cuestionario, nosotros le entregaremos una lista de recursos en la comunidad que ofrecen sus servicios si desean hablar con alguna persona sobre preocupaciones personales o sobre el mantenimiento de su salud y su bien psicológicamente. También se le ofrecerá información sobre programas sobre el uso del alcohol, las drogas y los productos de tabaco.

Este estudio es anónimo. El nombre de su hijo/hijo no aparecerá con las respuestas. Los

cuestionarios que termine su hijo/hija se combinarán con los cuestionarios de todos los otros alumnos; nosotros no podríamos distinguir las respuestas y los cuestionarios de un alumno con las respuestas y cuestionarios de los otros alumnos. Nosotros seríamos los únicos con acceso al gabinete con los documentos dándole permiso a su hijo/hija para participar en este estudio y conteniendo la firma de su hijo/hija. El permiso de participación que firman los alumnos se le explicará antes de entregarles los cuestionarios; este documento requiere la firma de su hijo/hija y se recogerá antes de llenar los cuestionarios para asegurar que las respuestas sean anónimas. Los archivos se mantendrán confidenciales al alcance de la ley. Personas autorizadas, empleados del Departamento de Salud y Servicios Humanos, los empleados y los miembros del Panel Institucional de Repaso de la Universidad del Sur de la Florida (USF) y personas actuando por parte de la Universidad del Sur de la Florida pueden revisar los archivos de este estudio, pero las respuestas individuales de cada participante no serán compartidas con empleados del sistema escolar o cualquier otra persona menos el doctor Rance L. Harbor y su grupo de investigadores.

Nota informativa: La decisión permitiendo la participación de su hijo/hija en este estudio investigativo debe ser totalmente voluntario. Usted tiene el derecho de permitir que su hijo/hija participe en este estudio investigativo y también tiene el derecho de retirar la participación de su hijo/hija el este estudio investigativo en cualquier momento deseado. La decisión que usted tome sobre la participación de su hijo/hija en este estudio investigativo no afectará de ninguna manera la posición de su hijo/hija como estudiante, sus notas, o su relación con Leto, las escuelas del condado de Hillsborough, la Universidad del Sur de la Florida (USF) o cualquier otra institución.

Lo que haremos con las respuestas de su hijo/hija: Nosotros planeamos utilizar la información obtenida durante este estudio investigativo para mejor informar a los maestros y los psicólogos sobre los efectos de los riesgos y los factores protectivos asociados con usos de sustancias (alcohol y drogas) entre alumnos en escuelas secundarias. Los resultados de este estudio investigativo se podrán publicar. Sin embargo, la información obtenida por parte de su hijo/hija estará combinada con la información obtenida de otros participantes en este estudio investigativo antes de publicación. Los resultados publicados no incluirán ningún tipo de información identificando a su hijo/hija.

Preguntas? Si usted tiene algunas preguntas sobre este estudio investigativo, favor de llamar al doctor Harbor al teléfono (813) 872-5300, extensión 303. Si usted tiene algunas preguntas sobre los derechos de su hijo/hijo como una persona participando en este estudio investigativo, favor de llamar a un miembro de la División de Cumplimento para Investigaciones en la Universidad del Sur de la Florida al teléfono (813) 974-9343.

Usted desea que su hijo/hija participe en este estudio investigativo? Para permitir que su hijo/hija participe en este estudio investigativo, favor de llamar el formulario proporcionado para que su hijo/hija se lo entregue a su maestro/maestra de homeroom.

Sinceramente,

Rance L. Harbor, Ph.D.
Psicólogo para el Condado Escolar de Hillborough
Profesor Visitante de la Universidad del Sur de la Florida
Departamento de Fundamentos Psicólogos y Sociales

Permiso pare participar en este estudio investigativo

Libremente doy mi permiso para que participe mi hijo/hija en este estudio investigativo. Entiendo que esto es una investigación escolar. Yo he recibido una copia de este formulario y documentos para mis expedientes.

_____ _____

Nombre del Estudiante (Escrito con letras Mayúsculas) Nivel Escolar del Estudiante

_____ _____ _____

Firma del Padre Nombre del Padre Fecha
Alumno Participando En Este Estudio (Escrito con letras Mayúsculas)

Declaración de la persona obteniendo consentimiento informado

Yo certifico que los participantes han recibido un formulario de Consentimiento Informado aprobado por el Panel de Repaso Institucional de la Universidad del Sur de la Florida (USF) explicando la historia, las demandas, los riesgos, y los beneficios asociados con la participación en este estudio investigativo. También certifico que un número de teléfono se ha proporcionado por si acaso tendrían algunas preguntas adicionales.

_____ _____ _____

Firma de la Persona Obteniendo Consentimiento Informado
Nombre de la Persona Obteniendo Consentimiento Informado (Escrito con letras Mayúsculas)
Fecha

Appendix B: Parental Consent Form, English Version

Dear Parent or Caregiver:

This letter provides information about a research study that will be conducted at Leto Senior High School by investigators from the University of South Florida. Our goal in conducting the study is to determine the effect of students' experiences at school, home, and with friends on their psychological wellness and health**.**

✓ Who We Are: The research team consists of Rance L. Harbor, Ph.D., a Hillsborough County School Psychologist who is also a visitor professor in the College of Education at the University of South Florida (USF), and several graduate students in the USF School Psychology Program. We are planning the study in cooperation with the principal of Leto Senior High School (Leto) to make sure the study provides information that will be helpful to the school.

✓ Why We Are Requesting Your Child's Participation: This study is being conducted as part of a project entitled, "**Risk and Protective Factors Associated with Substance Use Among High School Students**." Your child is being asked to participate because he or she is a student at Leto High School.

✓ Why Your Child Should Participate: We need to learn more about what leads to alcohol and drug use during high school. The information that we collect from students may increase our overall knowledge of risk factors that lead to drug and/or alcohol use as well as what characteristics and activities serve as a protective factor. In addition, information from the study will be shared with the teachers and administrators at Leto in order to increase their knowledge of specific school experiences that lead to wellness in students. Please note neither you nor your child will be paid for your child's participation in the study. However, all students who participate in the study will be entered into a drawing for one of several gift certificates.

✓ What Participation Requires: If your child is given permission to participate in the study, he or she will be asked to complete several paper-and-pencil questionnaires. These questionnaires will ask about your child's thoughts, behaviors, and attitudes towards drug and alcohol use, participation in extracurricular activities, sports, peer relationships, and mental health history. Completion is expected to take your child between 30 and 45. We will personally administer the questionnaires at Leto, during regular school hours in the Spring 2008 semester, to large groups of students who have parent permission to participate. In total, participation will take about one hour of your child's time during one school day.

✓ Anonymity of Your Child's Responses: There is minimal risk to your child for participating in this research. We will be present during administration of the questionnaires in order to provide assistance to your child if he or she has any questions or concerns. In addition, after your child has completed the questionnaires, we will give your child a list of community mental health resources in case he or she would like to discuss personal issues or find out more information about tobacco, alcohol, and drug use.

✓ *This study is anonymous*. Your child's name will not be linked in any way to his or her responses. Your child's completed packet of questionnaires will be added to the stack of packets from other students; we will not be able to identify which student completed which questionnaires. Only we will have access to the locked file cabinet stored at USF that will contain the form your child must sign in order to take part in this study. This permission form will be explained, signed, and collected before questionnaires are handed out in order to avoid linking students' names to their responses. Your child's privacy and research records will be kept confidential to the extent of the law. Authorized research personnel, employees of the Department of Health and Human Services, the USF Institutional Review Board and its staff, and other individuals acting on behalf of USF may inspect the records from this research project, but your child's individual responses will not be shared with school system personnel or anyone other than Dr. Harbor and his research assistants.

✓ Please Note: Your decision to allow your child to participate in this research study must be completely voluntary. You are free to allow your child to participate in this research study or to withdraw him or her at any time. Your decision to participate, not to participate, or to withdraw participation at any point during the study will in no way affect your child's student status, his or her grades, or your relationship with Leto, Hillsborough County Schools, USF, or any other party.

✓ What We'll Do With Your Child's Responses: We plan to use the information from this study to inform educators and psychologists about the effects of various risk and protective factors associated with high school alcohol and/or drug use. The results of this study may be published. However, the data obtained from your child will be combined with data from other people in the publication. The published results will not include your child's name or any other information that would in any way personally identify your child.

✓ Questions? If you have any questions about this research study, please contact Dr. Harbor at (813) 872-5300 ext 303. If you have questions about your child's rights as a person who is taking part in a research study, you may contact a member of the Division of Research Compliance of the USF at (813) 974-9343.

✓ Want Your Child to Participate? To permit your child to participate in this study, complete the attached consent form and have your child turn it in to his or her homeroom teacher.

Sincerely,

Rance L. Harbor, Ph.D.
School Psychologist Hillsborough County Public Schools
Visiting Professor, University of South Florida

Consent for Child to Take Part in this Research Study

I freely give my permission to let my child take part in this study. I understand that this is research. I have received a copy of this letter and consent form for my records.

_____	_____
Printed name of child	Grade level of child
_____	_____
Signature of parent of child taking part in the study	Printed name of parent

Statement of Person Obtaining Informed Consent

I certify that participants have been provided with an informed consent form that has been approved by the University of South Florida's Institutional Review Board and that explains the nature, demands, risks, and benefits involved in participating in this study. I further certify that a phone number has been provided in the event of additional questions.

_____	_____
Signature of person obtaining consent	Printed name of person obtaining consent

Appendix C: Student Assent Form

Hello!

Today you will be asked to take part in a research study by filling out several questionnaires. Our goal in conducting the study is to determine the effect of students' experiences at school, home, and with friends on their psychological wellness and health**.**

✓ Who We Are: The research team consists of Rance L. Harbor, Ph.D., the School Psychologist here at Leto High School and a professor in the College of Education at the University of South Florida (USF), and several graduate students in the USF School Psychology Program. We are working with your principal to make sure the study provides information that will be helpful to your school.

✓ Why We Are Asking You to Take Part in the Study: This study is part of a project called, "**Risk and Protective Factors Associated with Substance Use Among High School Students**." You are being asked to take part because you are a student at Leto High School.

✓ Why You Should Take Part in the Study: We need to learn more about what leads to drug and/or alcohol use during high school. The information that we gather may help us better understand what causes psychological wellness during high school and specifically what factors help students not to use alcohol and/or drugs. In addition, information from the study will be shared with the teachers and administrators at Leto to help them understand which specific school experiences lead to wellness in students. Please note you will not be paid for taking part in the study. However, all students who participate in the study will be entered into a drawing for one of several gift certificates.

✓ Filling Out the Questionnaires: These questionnaires ask you about your thoughts, behaviors, and attitudes towards alcohol and drugs as well as peer relationships, participation in extra-curricular activities, and athletics, and life in general. We expect it will take between 30 and 45 minutes to fill out the questionnaires.

✓ Please Note: Your involvement in this study is completely voluntary. By signing this form, you are agreeing to take part in this research. Your decision to participate, not to participate, or to withdraw participation at any point during the study will in no way affect your student status or your grades; you will not be punished in any way. If you choose not to participate, it will not affect your relationship with Leto High School, USF, or anyone else.

✓ Privacy of Your Responses: We do not expect that there will be more than minimal risk to you for taking part in this research. We will be here to help the entire time you are filling out the surveys in case you have any questions or concerns. When you hand in your completed questionnaires, we will give you a piece of paper that lists places you can call and go to in the community if you would like to discuss personal issues. The paper also tells you how to find out more information about tobacco, alcohol, and drug use. *This study is anonymous*. Your name will not be linked in any way to your responses. Your completed packet of questionnaires will be added to the stack of packets from other students; we will not be able to tell which student completed which questionnaires. Only we will have access to the locked file cabinet stored at USF that will contain this signed permission form. Your privacy and research records will be kept confidential (private, secret) to the extent of the law. People approved to do research at USF, people who work for the Department of Health and Human Services, the USF Institutional Review Board and its staff, and other individuals acting on behalf of USF may look at the records from this research project, but your individual responses will not be shared with people in the school system or anyone other than us and our research assistants.

✓ What We'll Do With Your Responses: We plan to use the information from this study to let others know about the effects of different experiences at school, home, and with friends on students' happiness and risky health behavior. The results of this study may be published. However, your responses will be combined with responses from other people in the publication. The published results will not include your name or any other information that would in any way identify you.

✓ Questions? If you have any questions about this research study, please raise your hand now or at any point during the study. Also, you may contact us later at (813) 872-5300 ext 303 (Dr. Harbor). If you have questions about your rights as a person who is taking part in a research study, you may contact a member of the Division of Research Compliance of the USF at (813) 974-9343, or the Florida Department of Health, Review Council for Human Subjects at 1-850-245-4585 or toll free at 1-866-433-2775.

Thank you for taking the time to take part in this study.

Sincerely,

Rance L. Harbor, Ph.D.
School Psychologist, Hillsborough County Public Schools
Visiting Professor, University of South Florida
Department of Psychological and Social Foundations

Assent to Take Part in this Research Study

I freely give my permission to take part in this study. I understand that this is research. I have received a copy of this letter and assent form for my records.

_____	_____	_____
Signature of child taking part in the study	Printed name of child	Date

Statement of Person Obtaining Informed Consent

I certify that participants have been provided with an informed consent form that has been approved by the University of South Florida's Institutional Review Board and that explains the nature, demands, risks, and benefits involved in participating in this study. I further certify that a phone number has been provided in the event of additional questions.

_____	_____	_____
Signature of person obtaining consent	Printed name of person obtaining consent	Date

Appendix D: Demographic Information Survey

1. Gender
- ❍ 1) Female
- ❍ 2) Male

2. Ethnicity
- ❍ 1. African American/Black
- ❍ 2. Asian/ Pacific Islander
- ❍ 3. White
- ❍ 4. Hispanic
- ❍ 5. Native American/ Alaska Native
- ❍ 6. Other (Specify _____)

3. Age
- ❍ 13
- ❍ 14
- ❍ 15
- ❍ 16
- ❍ 17
- ❍ 18
- ❍ 19
- ❍ 20
- ❍ 21
- ❍ 22

4. Grade
- ❍ 9
- ❍ 10
- ❍ 11
- ❍ 12

5. Estimated overall GPA
- ❍ 4.0 or higher (A)
- ❍ 3.0-3.9 (B)
- ❍ 2.0-2.9 (C)
- ❍ 1.0-1.9 (D)
- ❍ Less than 1.0 (F)

6. Do you receive Free or Reduced-Priced School Lunch?
- ❍ 1. Yes
- ❍ 2. No

7. Including last year, and this year, have you been absent?
- ❍ 1. Zero to 2 times
- ❍ 2. 3-9 times
- ❍ 3. 10 or more times

8. Have you ever received any discipline referrals for behaviors other than being tardy
- ❍ 1. Never
- ❍ 2. 1 to 5 times
- ❍ 3. 6 or more times

9. Have you ever been suspended out of school (including ATOSS)?
- ❍ 1. Never
- ❍ 2.1 to 5 days total
- ❍ 3. 6 or more days total

10. Have you ever been arrested?
- ❍ 1. Never
- ❍ 2. 1 to 2 times
- ❍ 3. 3 or more times

11. Have you ever been diagnosed with Attention Deficit Disorder (ADD/ADHD)?
- ❍ 1. Yes
- ❍ 2. No

12. Have you ever been diagnosed with Anxiety, Depression, or other mental health problems?
- ❍ 1. Yes
- ❍ 2. No

13. Have you ever been prescribed medication for Attention Deficit Disorder (ADD/ADHD)?
- ❍ 1. Yes, and I still take the medication.
- ❍ 2. Yes, but I no longer take medication.
- ❍ 3. No

14. Have you ever been prescribed medication for Anxiety, Depression, or other mental health problems?
- ❍ 1. Yes, and I still take the medication.
- ❍ 2. Yes, but I no longer take medication.
- ❍ 3. No

Appendix E: Peer Substance Abuse Resource Scale

How likely would you be to do any of the following if you had a CLOSE Friend who was using drugs or alcohol?

	How Likely?			
	Extremely Unlikely	Somewhat Unlikely	Somewhat Likely	Extremely Likely
1. Tell them to stop.	1	2	3	4
2. Report their use to an authority. (e.g., police)	1	2	3	4
3. Seek advice from a trusted adult in the community. (e.g., church leader)	1	2	3	4
4. Do nothing.	1	2	3	4
5. Use with them.	1	2	3	4
6. Tell another peer. (e.g., classmate, friend)	1	2	3	4
7. Call a teen Help line.	1	2	3	4
8. Seek help from adult at school. (e.g., teacher, guidance counselor)	1	2	3	4
9. Talk to my parents.	1	2	3	4
10. Talk to my friend's parents.	1	2	3	4
11. Other:_____	1	2	3	4

How likely would you be to do any of the following if you had a CLASSMATE (who was not a close friend) who was using drugs or alcohol?

	How Likely?			
	Extremely Unlikely	Somewhat Unlikely	Somewhat Likely	Extremely Likely
1. Tell them to stop.	1	2	3	4
2. Report their use to an authority. (e.g., police)	1	2	3	4
3. Seek advice from a trusted adult in the community. (e.g., church leader)	1	2	3	4
4. Do nothing.	1	2	3	4
5. Use with them.	1	2	3	4
6. Tell another peer. (e.g., classmate, friend)	1	2	3	4
7. Call a teen Help line.	1	2	3	4
8. Seek help from adult at school. (e.g., teacher, guidance counselor)	1	2	3	4
9. Talk to my parents.	1	2	3	4
10. Talk to my friend's parents.	1	2	3	4
11. Other:_____	1	2	3	4

Appendix F: Teen Alcohol and Drug Use Scale

In the past 12 months, on how many occasions (if any) have you used the following drugs?

Alcohol/Substance Use	Circle the number that best describes on how many occasions						
	Zero occasions	1-2 occasions	3-5 occasions	6-9 occasions	10-19 occasions	20-39 occasions	40 or more occasions
1. Cigarettes/Cigars	1	2	3	4	5	6	7
2. Chewing Tobacco	1	2	3	4	5	6	7
3. Wine/Wine Coolers/Malt Beverages (e.g., Smirnoff Ice)	1	2	3	4	5	6	7
4. Beer	1	2	3	4	5	6	7
5. Liquor (e.g., vodka, rum, whiskey)	1	2	3	4	5	6	7
6. Marijuana	1	2	3	4	5	6	7
7. Inhalants (e.g., glue or gasoline)	1	2	3	4	5	6	7
8. Over the counter drugs when you are **NOT** sick/hurt (e.g., cough medicine)	1	2	3	4	5	6	7
9. Prescription drugs **NOT** prescribed to you (e.g., Zanex, Prozac, Ritalin, Adderall)	1	2	3	4	5	6	7
10. Prescription drugs prescribed to you when you are not sick or hurt (e.g., Zanex, Prozac)	1	2	3	4	5	6	7
11. Steroids	1	2	3	4	5	6	7
12. Ecstasy	1	2	3	4	5	6	7
13. Hallucinogens (e.g., LSD, Mushrooms)	1	2	3	4	5	6	7
14. Stimulants (uppers)	1	2	3	4	5	6	7
15. Barbiturates (downers)	1	2	3	4	5	6	7
16. Meth	1	2	3	4	5	6	7
17. Cocaine	1	2	3	4	5	6	7
18. Crack	1	2	3	4	5	6	7
19. Heroine (e.g., cheese)	1	2	3	4	5	6	7
20. Other _____	1	2	3	4	5	6	7