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Relationships between substance use, mental health problems, and involvement in school-based extracurricular activities among high school students

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Relationships Between Substance Use, Mental Health Problems, and Involvement in School-Based Extracurricular Activities Among High School Students

by

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ABSTRACT

Substance use during adolescence is associated with numerous undesirable short term and long term consequences. This study examined rates of substance use, as well as rates of elevated anxiety and depressive symptomalogy, among 138 students attending a predominantly Hispanic, low-SES high school. The current study also examined the complex relationships between adolescent substance use, mental health problems, and involvement in school-based extracurricular activities, among this ethnically diverse sample. Results included that a significant proportion of adolescents in the sample fell in the "at-risk" category for a clinical diagnosis of depression and/or anxiety disorder. Further, those students who reported smoking cigarettes and using marijuana were more likely to endorse feelings/thoughts related to school avoidance. Results also indicated that the more adolescents reported being involved in prosocial/academically oriented school-based extracurricular activities and/or special interest clubs, the less likely they were to report smoking cigarettes. Finally, involvement in athletics protected students with social anxiety from using cigarettes. Implications of these findings for future research as well as practice are also discussed.

Chapter One

Introduction

Statement of the Problem

Substance use during the high school years is of particular concern because it has been linked to numerous negative outcomes, including adolescents' poor academic functioning and educational attainment (Diego, Field, & Sanders, 2003; Engberg & Morral, 2006; King, Iacono, & McGue, 2006), physical health (The National Survey on Drug Use and Health, 2008), socio-emotional functioning (The National Survey on Drug Use and Health, 2008), and later dependency to substances (Diego, et al., 2003; Johnston, O'Malley, Bachman, & Schulenberg, 2007). A National Institute on Drug Abuse report indicated that about three quarters of students (72%) have consumed alcohol before twelfth grade and approximately half of youth in the United States (46%) have tried cigarettes before the end of high school (Johnston et al., 2007). Substance use generally starts during early adolescence (Diego et al., 2003; Kandel, Yamagushi, & Chen, 1992; The National Survey on Drug Use and Health, 2008). Moreover, various factors have also been found to influence not only substance use but also the choice of substance; these factors include the youth's gender, age, ethnic/racial background, as well as socio-economic status (SES; Amaro et al., 2001; Bettes et al., 1990; Johnston et al., 2007; Luthar et al., 2005; Parker et al., 2000; Piko, 2006; Wagner et al., 2007; Wallace et al., 2003).

Mental health problems, more specifically depression and anxiety, are also of concern during adolescence. Depression and anxiety are two of the most common and prevalent internalizing disorders during adolescence (Albano et al., 2003; Costello et al., 2005; Huberty, 2008; Rushton et al., 2002). Current estimates suggest that as many as 15-20% of children and youth have depressive or anxiety problems that warrant direct intervention (Huberty, 2008). Prevalence rates of depression and depressive symptomalogy among children and adolescents range widely, from 1% to 18% (Costello, Egger, & Angold, 2005). Prevalence rates of anxiety among youth have also been found to be significant, ranging from 2% to 33% (Costello, Egger, & Angold, 2005). The current study focuses on generalized anxiety disorder (GAD) and social anxiety in particular, as they are among the most prevalent anxiety disorders during adolescence (Costello, Egger, & Angold, 2005). Although not a diagnosable anxiety disorder, school refusal/avoidance is also a focus of the current study as it has been found to be a symptom in multiple anxiety disorders and is associated with risky behaviors such as school failure and substance use (Kearney, 2008; Mattis & Ollendick, 2003). Such internalizing disorders have also been found to adversely impact adolescents' socio-emotional and academic functioning (Evans, Van Velsor, & Schumacher, 2002; McCarthy, Downes, & Sherman, 2008). As with substance use during adolescence, prevalence rates of depression and anxiety, as well as the severity and expression of the symptoms, are also influenced by demographic characteristics such as gender, age, ethnic/racial background, and SES (Angold et al., 1999; Cooley, 2004; Costello et al., 2006; Lewinsohn et al., 1998; Manassis et al., 2004; Roberts et al., 1997; Rushton et al., 2002; The National Survey on Drug Use and Health, 2008).

Links between substance use (e.g., tobacco, alcohol, marijuana) and internalizing disorders such as depression and anxiety have been found in several studies (Comeau, Stewart, & Loba, 2001; Diego et al., 2003; King et al., 2004; Kaplow, Curran, Angold, & Costello, 2001; Poulin, Hand, Boudreau, & Santor, 2005; Vogel, Hurford, Smith, & Cole, 2003). However the relationship between substance use and internalizing disorders, such as depression and anxiety, is not fully understood as the direction of the relationship is not certain (Grant, Stinson, Dawson, Chou, Dufour, Compton, Pickering, & Kaplan, 2004). Regardless, preventative efforts are warranted as youth with internalizing disorders and/or substance use problems have been found to experience academic difficulties (Albano et al., 2003; Aloise-Young & Chavez, 2002; Bhatia et al., 2007; Engberg & Morral, 2006; Evans et al., 2002; Farmer, 2002; Kessler et al., 1995; Van Ameringen et al., 2003).

Protective factors such as involvement in school-based extracurricular activities, which are characterized by structure and supervision while at the same time allowing youth to socialize and express their identity, positively impact educational outcomes and reduce the likelihood of substance use during adolescence (Bohnert et al., 2007; Darling, 2005; Eccles et al., 1999; Fredricks et al., 2006; Peck et al., 2008). To date, the relationships between students' involvement in school-based extracurricular activities, their mental health problems, and their substance use has not been extensively studied. In the one published study that has included these variables in the same project, Darling (2005) examined links between adolescent participation in school-based extracurricular activity, substance use, depression, and attitudes towards school. She found that extracurricular activity involvement predicted less tobacco and illicit drug use, but was

not related to depression nor alcohol use in the primarily Caucasian sample. Although Darling established activity involvement as a buffer against the adverse effect of stressful life events, this author (nor authors of any other published study) did not conceptualize or test school involvement as a possible moderator in the relationships between depression and substance use or between anxiety and substance use. Such research with depression (or anxiety) as the predictor and substance use as the outcome is needed in order to determine if activity involvement serves as a protective factor, especially among students particularly at risk, such as students from low SES backgrounds. It is imperative for school psychologists to identify factors, such as activity involvement, that would potentially help prevent or alleviate substance use during high school, particularly among students with symptoms of mental health problems. School psychologists and other school based mental health providers have the opportunity to participate in preventative efforts as they are in the schools and can provide services on a consistent basis.

Definition of Key Terms

Substance use. This study focuses on adolescents, for whom it is illegal to consume substances (e.g., alcohol and cigarettes) that are not unlawful for adults. Substance use in this study includes several illicit substances (i.e., alcohol, cigarettes, and marijuana). In the majority of studies, substances are often categorized into distinct groups. This study also examined substance use by categorizing substances into three types: Alcohol, Cigarettes, and Marijuana.

Depression. In the current study, prevalence rates of depressive symptomalogy are discussed, as well as level of risk for actual diagnoses of depression. Depressive symptomalogy is different from Major Depressive Episode and presents depression on a

continuum. Even when a clinical diagnosis is not met, high scores on self-report measures of depression may indicate impaired functioning and a greater likelihood of developing later mental health disorders. Adolescents experiencing sub-syndromal depressive symptoms can benefit from early preventative efforts as these symptoms still warrant treatment.

Anxiety. This study also discusses rates of anxiety symptomalogy among adolescents and specifically looked at Generalized Anxiety Disorder (GAD), social anxiety, and school refusal/avoidance. Symptoms were also conceptualized on a continuum in addition to level of risk for actual clinical diagnoses. Higher scores on self-report measures of anxiety may be indicative of the presence of a later development of clinically diagnosed anxiety disorders.

Involvement in school-based extracurricular activities. Numerous studies have investigated adolescents' involvement in school-based extracurricular activities (Bohnert & Garber, 2007; Darling, 2005; Eccles & Barber, 1999; Fredricks & Eccles, 2006; Peck, Roeser, Zarett, & Eccles, 2008). Such involvement has been identified by Darling (2005) as providing for adolescents, a highly structured environment in which they can not only express their identity but also develop a strong social network while being supervised by adults and monitored for delinquent behaviors. In the current study, school involvement is defined as participation in different types of school-based extracurricular activities such as athletics (e.g., basketball, gymnastics), performing arts (e.g., music, dance), academics (e.g., language, academic clubs), and social clubs/hobbies (e.g., hobby clubs, social clubs). Such activities should be differentiated from unsupervised activities or after-school activities not affiliated with the schools (e.g., community sports team).

Purpose of the Current Study

This study examined the rate of substance use among adolescents (9^{th} to 12^{th} grade) in a predominantly low SES high school, attended by primarily Hispanic students, in the state of Florida. Furthermore, the percentage of adolescents in the sample who experienced elevated anxiety and depressive symptomalogy was also examined. Given that the use of substances and the presence of mental problems have been found to be common during adolescence, the current study expands on the aforementioned research by providing prevalence rates of substance use as well as anxiety and depression symptomalogy in a low SES and primarily Hispanic student sample. This study also specifically examined the relationship(s) between substance use, anxiety, and depressive symptomalogy.

This study also contributes to the current literature by determining the extent to which involvement in school-based extracurricular activities (e.g., athletics, performing arts, and special interests clubs) serves as a protective factor against substance use for adolescents who are experiencing anxiety and/or depressive symptomalogy. In other words, the current study attempted to determine if school involvement operates as a moderator in the relationship between mental health problems and substance use, such that involvement in school-related activities buffers students experiencing mental health problems from abusing substances. Very few studies have examined the relationships between mental health problems and substance use among adolescents while also looking at engagement in school-based extracurricular activities. The current study looked at the dynamics between all these variables, while taking into considerations students' demographic characteristics (e.g., gender, age, ethnic/racial background, SES).

Identifying specific aspects of school involvement that serve as protective factors against substance use assists school psychologists in the development and implementation of effective prevention programs.

Research Questions

In sum, the research questions examined in the following study include:

1. Among students attending a predominantly low-SES high school, what is the rate of adolescent substance use with respect to the following substances:
    a. Alcohol (e.g., liquor, beer, and wine)
    b. Cigarettes
    c. Marijuana?
2. Among students attending a predominantly low-SES high school, what is the percentage of students who have/are experiencing clinical levels of the following mental health problems:
    a. Depression
    b. Anxiety
        i. General Anxiety Disorder
        ii. Social Anxiety Disorder
        iii. Significant school avoidance?
3. What are the relationships between substance use and mental health problems such as anxiety disorders and depression among high school students?
4. Is school involvement a moderator in the relationship between mental health problems and substance use, such that high levels of school involvement protect students who experience mental health problems from abusing substances?

Limitations

The current study analyzed an archival dataset that includes data from 10.3% of eligible students at the participating high school. Due to the convenience sampling method used to obtain the data, as well as the requirement for active parent consent and active student assent to participate, the students who did participate in the study could differ significantly from students whose parents declined participation. In the current study, the participants were from a predominantly low SES high school and predominantly Hispanic. As a result, the findings of the study might not generalize to a higher SES high school or to other ethnic groups. Furthermore, the sample size for this study is fairly small (139 participants). The small sample size limits statistical power, as well as the likelihood that the participants' scores on the measured variables will be representative of the overall population.

Another limitation is that all the information in the archival dataset came from only one source, adolescents' self-report. Additional rater biases might occur due to normal mood changes that youth experience during adolescence. Also, the assessment instrument students used to report current depressive symptomalogy involves moods in only the past two weeks and not past levels of symptomalogy which might also limit the results of this study. Regarding school involvement, this study does not provide in-depth information about every possible extracurricular activity in which students were involved; instead, information is available regarding adolescents' involvement in broad categories of activities (e.g., performing arts).

Contributions to the Literature

The current study adds to the literature on substance use, anxiety, and depressive

symptomalogy, as well as student involvement in school-based extracurricular activities, by comprehensively examining the interrelationships among all four variables. A greater understanding of the relationship between mental health problems and substance use, as well as the relationship between school involvement in extracurricular activities and substance use, adds to the literature by providing more detailed information on these topics specific to students attending a predominantly low-SES high school with a significant Hispanic student population. Findings relevant to involvement in particular school-related activities as a buffer against substance use is crucial to the development of effective school-based preventive programs for youth who are at-risk for engaging in substance use. Preventing substance is essential due to the many deleterious effects of substance use on students' short-term and long-term educational outcomes.

Chapter Two

Review of the Literature

The following literature review begins with a definition of substance use disorders as well as the prevalence of substance use during adolescence. The relationships between demographic variables, namely socio-economic status (SES), ethnicity, and gender, and adolescent substance use are also discussed. Next, two mental health problems, specifically adolescent depressive disorders and anxiety disorders, are defined. The prevalence of specific anxiety disorders (e.g., generalized anxiety, social anxiety, and significant school avoidance) is also reviewed in part to provide a rationale for how the specific anxiety disorders to be examined in the current study were selected as foci. Then, the links between mental health problems and substance use among high school students are presented. Finally, implications for school psychologists are discussed by presenting the relationships between mental health problems, substance use, and academic achievement, and explaining the role of school involvement in extracurricular activities as a potential protective factor in students' outcomes.

Overview of Substance Use

Substance use during adolescence is a major concern in the United States. Trends in substance use among youth have been examined via the Monitoring the Future Study (MFS), a large-scale data collection effort that has been conducted annually since 1975. The MFS examines current prevalence rates of substance use among 8^{th}, 10^{th}, and 12^{th} grade students in the United States. In 2006, nearly 50, 000 students from over 403

secondary schools nationwide participated in the MFS. According to the 2006 MFS results, approximately three quarters of students (72%) have consumed alcohol before twelfth grade, approximately half of American youth (46%) have tried cigarettes before the end of high school, and almost one quarter of twelfth grade students (22%) are current cigarette smokers (Johnston, O'Malley, Bachman, & Schulenberg, 2007). Trends in substance use have also been examined by the Substance Abuse and Mental Health Services Administration (SAMHSA). SAMHSA sponsors an annual survey on substance use and health issues and approximately 67, 500 people are interviewed each year. In this annual report, a section is devoted to youth between the ages of 12 and 17 years. In the results from the 2007 National Survey on Drug Use and Health (NSDUH; 2008), the current rate of illicit (e.g., marijuana, ecstasy, cocaine, LSD, and prescription-type drugs used nonmedically) drug use in the United States among youth is 9.5%, which is relatively stable compared to the 2006 rate (9.8%). As for alcohol, youths' binge drinking rates in 2007 were approximately 10%. Youth substance use has been a major problem in the United States for many years and has negative impacts on various aspects of one's life such as socio-emotional functioning, health, and academic performance (Diego, Field, & Sanders, 2003).

Substance abuse disorders are defined by the Diagnostic and Statistical Manual-IV (DSM-IV-TR, American Psychiatric Association, 2000) as:

> "a maladaptive pattern of substance use, leading to clinically significant impairment or distress, as manifested by three (or more) of the following, occurring within a twelve-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; neglect of children or household), (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), (3) recurrent substance-related legal problems (e.g., arrests for substance-related disorderly conduct), and (4) continued substance use despite having persistent or recurrent social or interpersonal problems caused or exacerbated by the effects of the substance (e.g., arguments with spouse about consequences of intoxication, physical fights); (p.199).

In this study, the term "substance use" is used and is described as situations in which an individual is currently using and/or has used substances in the past twelve months, but does not necessarily meet the criteria for a substance use disorder.

Substance use is usually initiated in adolescence and typically begins with the use of substances such as alcohol and tobacco, then followed by marijuana and other illegal substances (Diego et al., 2003; Kandel, Yamagushi, & Chen, 1992; The National Survey on Drug Use and Health, 2008). A considerable number of adolescents who use substances also report some problems associated with the use of these substances such as going to school and playing sports while under the influence (Zoccolillo, Vitaro, & Tremblay, 1999). Zoccolillo et al. (1999) surveyed adolescents (879 boys and 929 girls) in Canada on problems related to their use of alcohol and illegal drugs and found that of illegal drug users, 94% of boys and 85% of girls reported at least one problem related to the use of drugs.

Prevalence of Substance Use in Adolescence

According to the most recent MFS national survey of adolescent drug use, in 2006, the annual prevalence rate of any alcohol use in grades 8, 10, and 12 was 31.8%, 56.3%, and 66.4% of respondents, respectively (Johnston et al., 2007). Alcohol use remains considerably widespread among today's adolescents and has been consumed by almost three quarters of students by the end of high school. In terms of tobacco use among high school students, almost half of young Americans (47%) have tried cigarettes by twelfth grade and 22% of twelve grade students are current smokers. As for eight grade students, 25% have tried cigarettes (Johnston et al., 2007).

In 2006, the annual prevalence rate of any use of illicit drug in grades 8, 10, and 12 was 13.2%, 28.1%, and 35.9%, respectively. Even though there was a slight decline in the use of certain drugs in 2006, these declines were not found to be statistically significant, suggesting that the use of illicit drugs still merits concern (Johnston et al., 2007). A slight increase in the use of marijuana and heroin among twelve grade students was observed in 2006, as were increases in the use of inhalants and cocaine among tenth grade students, and the use of LSD and ecstasy among eight to twelve grade students (Johnston et al., 2007).

Relationship between Substance Use and Demographic Characteristics

It is important to consider demographic characteristics as well as differences between subgroups when examining the prevalence rate of substance use among high school students, as certain demographic variables are associated with the rate and choice of substance use. Key studies that examined the links between adolescent substance use and students' socio-economic status, gender, and ethnicity/race are reviewed next.

Socio-economic status (SES). In the MFS (2007), very small differences were found between substance use among high school students and the average educational level of the students' parents, which is used as a measure of SES. Furthermore, minimal differences have been found between other measures of SES, such as family income, and adolescent substance use (Parker, Calhoun, & Weaver, 2000). However, it has been suggested that SES can increase the risk of adolescent substance use in cases of extreme poverty level and when behavior problems are noticeable (Hawkins, Catalano, & Miller, 1992; Mash & Barkley, 2003). It should also be noted that the relationship between adolescent substance use and SES can vary depending on the substance. An increase in the use of cocaine, because of the growth in the prevalence of crack cocaine, was associated with lower-SES populations in the 1980s (Mash & Barkley, 2003). This trend is currently less noticeable but still illustrates how such demographic variables can influence the use of particular substances among adolescents.

Luthar and Ansary (2005) examined whether engaging in various problem behaviors, including substance use, would have an impact on academic school performance and whether these links would vary in relation to SES. They surveyed 488 tenth grade students from various communities in the North East. Among these students, 264 were from an affluent suburban high school (higher SES) and 224 were from an inner-city school (lower SES). The schools were chosen to represent both ends of the SES continuum, based on family income and level of education. To measure substance use, the authors used a grid which was adapted from the MFS (Johnston, O'Malley, & Bachman, 1984). The researchers found that substance use, especially cigarette smoking, was higher among adolescents from the higher SES suburban school, and that substance

use had a significant negative relation to academic grades only among the students in the higher SES school (Luthar & Ansary, 2005).

Race/ethnicity. In the MFS, significant relationships were found between adolescents' race/ethnicity and their rate of substance use (Johnston et al., 2007). Among eighth, tenth, and twelfth grade African-American students, significantly lower rates of use of any illicit drugs, alcohol, and cigarettes are found when compared to Caucasian students, especially use of cigarettes. Hispanic students reported higher rates of crack, heroin, and methamphetamine use in grade twelve. In general, their rates of substance use were higher than African American students but lower than Caucasian students in twelfth grade. However, in eighth grade, Hispanic youth reported higher rates of drug use (e.g., crack, heroin) than African American and Caucasian students. Various explanations have been offered as to why Hispanic students' rate of substance use decreases by twelfth grade, including that this trend may be due to the high school dropout rate of Hispanic students and/or due to the fact that other ethnic groups initiate substance use later in adolescence (Johnston et al., 2007). In the results from the 2007 National Survey on Drug Use and Health (NSDUH; 2008), the rate of alcohol use in the past month for youth between the ages of 12 and 20 was lowest among Asian youth (16.8%), followed by African American youth (18.3%), Hispanic youth (24.7%), American Indian and Alaska Native youth (28.3%), and highest among Caucasian youth (32%).

Wallace, Bachman, O' Malley, Schulenberg, Cooper, and Johnston (2003) combined data from 1996 to 2000 drawn from the MFS to conduct an investigation of ethnic differences in substance use among adolescent girls. The authors focused their attention on adolescents who responded that they used alcohol, tobacco, and/or a variety

of illicit drugs (e.g., marijuana, cocaine, and stimulants) in their lifetime, in the last thirty days, or on a daily basis. Wallace and colleagues (2003) found that substance use was particularly high among Native American adolescent girls, relatively lower among Caucasian, African-American, and Hispanic girls, and was the lowest among Asian girls. The authors also pointed out that this pattern was very similar to the one observed for boys.

When looking at substance use and ethnic differences, it is also important to look at variations between subgroups of the same race, as well as potential differences in the type of substances with which adolescents experiment. Bettes, Dusenbury, Kerner, James-Ortiz, and Botvin (1990) determined differences exist, in terms of tobacco and alcohol consumption, between two Hispanic groups (Dominican and Puerto Rican), Caucasian, and African-American adolescents. The authors surveyed 2,125 seventh grade students in various New York City public and parochial schools. All participants were asked to report, on a 9-point scale, their rates of cigarette as well as alcohol consumption (1= never to 9=daily). No significant differences emerged between ethnic groups in terms of cigarette use. However, Dominican students had the highest rate of alcohol consumption (M = 1.81) when compared to Puerto Rican students (M = 1.65), Caucasian students (M = 1.67) and African-American students (M = 1.58).

Gender. Johnston et al. (2007) have also found gender differences in the use of substances during adolescence. In general, females report lower rates of illicit drug use and report using fewer types of drugs than males. Males also have higher rates of heavy drinking, whereas differences in the use of cigarettes are less apparent (Johnston et al., 2007). It should be noted, however, that rates of substance use in relation to gender varies

according to age and grade level. In younger grades, differences between genders are less apparent and become more noticeable by the end of high school, which may reflect a developmental phenomenon (Mash & Barkley, 2003).

Wallace et al. (2003) found similar gender differences. Specifically, among eighth grade adolescents, the rate of substance use between males and females was comparable, however gender differences were noticeable among the twelfth grade participants. During twelfth grade, marijuana and alcohol use were more prevalent among males than females. It should also be noted that within the past decade, the gender gap in substance use among twelve grade students has narrowed (Wallace et al., 2003).

In regards to gender differences in the likelihood of developing chemical dependence, Wagner and Anthony (2007) found that males were more likely to develop dependence on marijuana and alcohol than females. However, there were no gender differences with respect to the risk of becoming cocaine dependent. To arrive at these conclusions, the authors analyzed data from participants ages 15 to 44 years in the National Comorbidity Survey which was collected between 1990 and 1992. Data were gathered through structured interviews, using the Diagnostic and Statistical Manual of Mental Disorders, Revised Third Edition criteria to assess drug dependence.

In addition to differences in prevalence rates and substance dependence, reasons why people may choose to engage in substance use varies by gender. For instance, females report using alcohol and cigarettes to reduce anxiety (Amaro, Blake, Schwartz, & Flinchbaugh, 2001). This issue is discussed in further detail when looking at the relationships between substance use and anxiety disorders. Motives for why adolescents engage in substance were also discussed by Piko (2006). A total of 634 middle and high

school students between the ages of 11 and 19 years participated in this study with approximately equal number of males (50.6%) and females (49.4%). The students completed a questionnaire which included questions on smoking and drinking, social influences and social motives. The researcher found that males scored significantly higher than females on social motives for drinking. Adolescent boys were also more influenced by other friends' behaviors in terms of drinking and smoking.

In sum, substance use generally starts during the early adolescent years and is partly associated with demographic characteristics. Adolescence is a time of transitions whether they are physical, psychological, or social which can lead to various stressful life events (Maag & Irvin, 2005). Depression and anxiety during adolescence are also challenges that warrant attention as they usually emerge during this developmental period. The following sections define depression and anxiety as well as discuss prevalence rates and the impact these mental health problems can have on youth.

Mental Health Problems during Adolescence

Depression and anxiety are two of the most common psychological problems that children and adolescents can experience (Huberty, 2008). Current estimates suggest that as many as 15-20% of children and youth have depressive or anxiety problems that warrant direct intervention. According to Huberty (2008), "untreated or chronic anxiety or depression during the formative years can result in problems that persist into adulthood, affecting personal and occupational functioning" (p.1473). Internalizing disorders such as depression and anxiety can have negative consequences besides the immediate symptoms and impairment. Such internalizing disorders have been found to affect children and adolescents' self-esteem, academic performance, social relationships,

and substance use behavior, as well as elevate risk for developing more severe mental health problems and attempting or completing suicide (Merrell, 2008).

Overview of Depression

According to the Diagnostic and Statistical Manual of Mental Disorders-IV (DSM-IV-TR, American Psychiatric Association, 2000), in order to receive a diagnosis of Major Depressive Episode:

> Five (or more) of the following symptoms have been present during the same 2-week period and represent a change from previous functioning; at least one of the symptoms is either (1) depressed mood or (2) loss of interest or pleasure: (a) depressed mood most of the day, nearly every day, as indicated by either subjective report (e.g., feels sad or empty) or observation made by others (e.g., appears tearful); (b) markedly diminished interest or pleasure in all, or almost all, activities most of the day, nearly every day (as indicated by either subjective account or observation made by others); (c) significant weight loss when not dieting or weight gain (e.g., a change of more than 5% of body weight in a month), or decrease or increase in appetite nearly every day; (d) insomnia or hypersomnia nearly every day; (e) psychomotor agitation or retardation nearly every day (observable by others, not merely subjective feelings of restlessness or being slowed down); (f) fatigue or loss of energy nearly every day; (g) feelings of worthlessness or excessive or inappropriate guilt (which may be delusional) nearly every day (not merely self-reproach or guilt about being sick); (h) diminished ability to think or concentrate, or indecisiveness, nearly every day (either by subjective account or as observed by others); and (i) recurrent thoughts

of death (not just fear of dying), recurrent suicidal ideation without a specific plan, or a suicide attempt or a specific plan for committing suicide (p.356).

For this study, the author will examine rates of depressive symptomalogy among high school students and not actual clinical rates of depression. Depressive symptomalogy conceptualizes depression on a continuum and is different from Major Depressive Episode which requires a clinical diagnosis. It is also important to note that even if diagnostic criteria for depression are not met, sub-syndromal depressive symptoms can greatly impact an adolescent's life (Hammen & Rudolph, 2003). These authors further explain that high self-report scores may also indicate impaired functioning and the possibility of the later development of clinically diagnosed disorders. Yet, according to Evans, Van Velsor, and Schumacher (2002), depression may be one of the psychological disorders that is the most overlooked during adolescence. Underidentification and undertreatment are very common during childhood and adolescence (Bhatia & Bathia, 2007; Mufson & Pollack Dorta, 2003). Depressive symptoms have also been associated with various risk factors (e.g., suicide, substance use, and decline in school performance) for youth and affect various aspects of life including peer relationships, family relationships, and educational experiences (Bhatia & Bhatia, 2007; Evans et al., 2002).

Prevalence of Depression during Adolescence

According to epidemiological studies, the prevalence of depressive symptomalogy and depression in children and adolescents ranges between 1.6% and 8.9% (Angold & Costello, 2001). In 2007, approximately 8% of the population between the ages of 12 and 17 experienced a Major Depressive Episode (MDE) and 5.5% of these

youth experienced MDE with severe impairment in one or more of the following areas: chores at home, school, close relationship with families and their social life (results from the 2007 NSDUH, 2008). Depressed mood and individual symptoms of depression are even more common during adolescence (Rushton, Forcier, & Schectman, 2002). Rushton et al. (2002) analyzed the National Longitudinal Study of Adolescent Health data set, collected from 13, 568 adolescents in grades seven through twelve. The Center for Epidemiologic Studies- Depression (CES-D: Radloff, 1977) scale was used as the primary measure of depressive symptomalogy. The authors found that approximately 30% of the adolescent sample reported depressive symptomalogy and almost 10% indicated moderate to severe depressive symptoms. In the National Comorbidity Survey, the lifetime prevalence of major depression among fifteen to eighteen year olds was 14% with an additional 11% reporting minor depression (Kessler, Avenevoli, & Merikangas, 2001; Kessler & Walters, 1998).

Like substance use disorder, rates of depression among adolescents vary with gender, SES, and ethnicity/race. In terms of gender differences, higher rates of depressive diagnoses and symptoms are typically found among females (NSDUH, 2008; Rushton, Forcier, & Schectman, 2002; The National Survey on Drug Use and Health, 2008). In 2007, the rate of MDE was considerably higher among adolescent females (11.9%) than males (4.6%; NSDUH, 2008). Gender differences specifically emerge during the adolescent years. According to Angold, Costello, Erkanli, and Worthman (1999) depressive disorders are more than twice as common in girls as in boys by the age of fourteen. The authors explain that these differences can partly be attributed to differences in coping styles and/or hormonal changes during puberty. A meta-analysis that looked at

26 studies of youth younger than age 18, found that the overall prevalence estimates of depression based on model predictions averaged over studies were higher for adolescent girls (5.9%) than for adolescent boys (4.6%; Costello, Erkanli, & Angold, 2006).

Roberts, Roberts, and Chen (1997) examined gender and ethnocultural differences in the prevalence of adolescent depression. The authors surveyed 5,423 middle school students ranging from 10 to 17 years of age and measured depression using the DSM Scale for Depression through questionnaires. They found higher rates of prevalence among girls with a female: male ratio of 1.4. In terms of ethnic differences, Mexican American girls reported significantly higher rates of major depression (Roberts et al., 1997). No significant interactions between ethnic group and SES emerged.

In sum, the prevalence of depressive symptomalogy and depression in youth between the ages of 5 to 17 years ranges between 1% and 18% (Costello, Egger, & Angold, 2005). Rates of depression vary according to gender, with females experiencing higher rates of depression and more severe symptoms. Even when youth do not meet diagnostic criteria for depression, depressive symptomatology can greatly impact an adolescent's life and normal functioning (e.g., peer and family relationships, academic performance). Other mental health conditions warranting attention during adolescence include anxiety disorders. Several anxiety disorders that are particularly salient during the adolescent years are discussed in the following sections.

Overview of Anxiety Disorders

According to the National Mental Health Information Center (2003), anxiety disorders are among the most common mental health problems to occur during childhood and adolescence, as about 13% of children and adolescents (ages 9 to 17) experience

some type of anxiety disorder. In the United States, studies examining rates of anxiety disorders in youth estimated the prevalence to be between 10 and 20% (Albano, Chorpita, & Barlow, 2003; Costello & Angold, 1995). Notably, anxiety disorders are highly comorbid with other mental health conditions such as depression; additionally, the comorbidity among various anxiety disorders is particularly high for females (Bittner, Egger, Erkanli, Costello, Foley, & Angold, 2007; Lewinsohn, Zinbarg, Seeley, Lewinsohn, & Sack, 1997).

Regarding demographic characteristics associated with anxiety disorders, anxiety disorders are more common in adolescent females than in males (Lewinsohn, Gotlib, Lewinsohn, Seeley, & Allen, 1998; Manassis, Avery, Butalia, & Mendlowitz, 2004). This difference is noticeable after puberty; boys and girls may be almost equally affected during early childhood (Manassis et al., 2004). A different conclusion was drawn by Lewinsohn and colleagues (1998). In this longitudinal study, data indicated that by the age of 6 years, twice as many girls as boys had experienced an anxiety disorder.

Of note, little research has looked at childhood and adolescent anxiety disorders and the impact of culture, including the role of ethnicity or race. However, Cooley and Boyce (2004) suggest that "cultural self-constructs among multiethnic youth may influence the expression and severity of anxiety symptomatology as well as their choice of coping strategies" (p. 213).

According to the Diagnostic and Statistical Manual of Mental Disorders-IV (DSM-IV-TR, American Psychiatric Association, 2000), children and adolescents can be diagnosed with any of ten anxiety disorders: Separation anxiety disorder, panic disorder, agoraphobia, generalized anxiety disorder, social anxiety, specific phobia, obsessive-

compulsive disorder, posttraumatic stress disorder, acute stress disorder, and anxiety disorder NOS. This study focused on generalized anxiety disorder and social anxiety as they are among the most prevalent anxiety disorders during adolescence (Costello, Egger, & Angold, 2005). Although simple phobia is the most prevalent of anxiety disorders among youth, it is a very broad category that is difficult to measure. Thus, rates of simple phobia were not examined in the current study. Although school avoidance and/or refusal is a not a specific disorder in the DSM-IV-TR, it was also selected for focus in the current study as it is a symptom in multiple anxiety disorders and associated with risky behaviors such as school failure and substance use (Kearney, 2008; Mattis, & Ollendick, 2003). In sum, the current study specifically examined generalized anxiety disorder, social anxiety, and school refusal.

Generalized anxiety disorder (GAD). GAD typically has an onset in childhood or adolescence and a lifetime prevalence rate of 5% (DSM-IV-TR, American Psychiatric Association, 2000). Rates of GAD may increase with age (Hersen, Thomas, Segal, Andrasik, & Ammerman, 2005). GAD is defined in the DSM-IV-TR as:

> Excessive anxiety and worry (apprehensive expectation), occurring more days than not for at least 6 months, about a number of events or activities (such as work or school performance). The person finds it difficult to control the worry, and the anxiety and worry are associated with three (or more) of the following six symptoms (with at least some symptoms present for more days than not for the past 6 months): (a) restlessness or feeling keyed up or on edge, (b) being easily fatigued, (c) difficulty concentrating or mind going blank, (d) irritability, (e) muscle tension, and (f) sleep disturbance (difficulty falling or staying asleep, or

restless unsatisfying sleep) (p. 476).

In order to meet diagnostic criteria for GAD it is also required that "the anxiety, worry, or physical symptoms cause clinically significant distress or impairment in social, occupational, or other important areas of functioning" (p.476).

In youth with GAD, anxiety is often focused on school performance and sport activities even when these individuals or their performance are not being judged or evaluated by others (DSM-IV-TR, APA, 2000). Furthermore, these children and adolescents tend to doubt themselves and redo assignments due to perfectionist tendencies and extreme dissatisfaction with performance.

In the current study, rates of anxiety symptomalogy among high school students were examined, in addition to risk levels for clinical diagnoses of GAD. Symptoms of GAD range the full continuum, while GAD requires a clinical diagnosis and conceptualizes the experience of GAD on a dichotomy.

Social anxiety. Social anxiety generally has an onset during mid-adolescence and a lifetime prevalence ranging from 3% to 13% (DSM-IV-TR, American Psychiatric Association, 2000). Costello et al. (2005) summarized the results of prevalence studies of mental health disorders in youth (ages 5 to 17) published since 1993; prevalence estimates for social anxiety were between 1% and 12%. Social anxiety is defined in the DSM-IV-TR as:

> (a) A marked and persistent fear of one or more social or performance situations in which the person is exposed to unfamiliar people or to possible scrutiny by others. The individual fears that he or she will act in a way (or show anxiety symptoms) that will be humiliating or embarrassing. In children, there must be

> evidence of the capacity for age-appropriate social relationships with familiar people and the anxiety must occur in peer settings, not just in interactions with adults. (b) Exposure to the feared social situation almost invariably provokes anxiety, which may take the form of a situationally bound or situationally predisposed Panic Attack. In children, the anxiety may be expressed by crying, tantrums, freezing, or shrinking from social situations with unfamiliar people. (c) The person recognizes that the fear is excessive or unreasonable. (d) The feared social or performance situations are avoided or else are endured with intense anxiety or distress. (e) The avoidance, anxious anticipation, or distress in the feared social or performance situation(s) interferes significantly with the person's normal routine, occupational (academic) functioning, or social activities or relationships, or there is marked distress about having the phobia (p. 456).

School refusal/ avoidance. According to Kearney (2008), school avoidance behavior can consist of various behaviors such as extended absences from school, periodic absences from school or missed classes, chronic tardiness, and intense fear or anxiety about school that leads to future nonattendance. School avoidance has manifested as a symptom of various mental health disorders in several studies. For instance, Kearney and Albano (2004) examined a clinical sample of 143 youth between the ages of 5 and 17 years who demonstrated school avoidance behaviors. The authors found that the most common primary diagnoses among these youth were separation anxiety (22.4%), generalized anxiety (10.5%), oppositional defiant disorder (8.4%), major depression (4.9%), specific phobia (4.2%), and social anxiety (3.5%).

As school avoidance is not a formal psychiatric diagnosis, it is undecided how this

behavior should be defined or classified (Kearney, 2008). Kearney and Albano (2004) identified four functions or reasons why children and adolescents might refuse to attend school. The first involves avoidance of school-related stimuli that provoke general anxiety and depression, a function often associated with GAD. The second function involves escape from aversive social and evaluative situations in the school environment such as exams or athletic performance. This function generally applies to adolescents in middle or high school and is commonly associated with GAD and social anxiety. The third function involves pursuing attention from significant others such as parents. This function is less pertinent to adolescents as it is linked to separation anxiety disorder. The final function is most prevalent in older children and adolescents who refuse to go to school in order to engage in more appealing activities such as substance use or spending time with friends. According to Kearney (2008), this fourth function is most often linked to externalizing disorders such as conduct disorder. In addition to these four primary functions, environmental risk factors such as poverty, school climate, and parental involvement, have been found to affect school avoidance behavior (Kearney, 2008).

In sum, anxiety disorders are quite prevalent with rates between 10 and 20% in youth (Albano, Chorpita, & Barlow, 2003; Costello & Angold, 1995). Generalized anxiety disorder and social anxiety are among the most prevalent of anxiety disorders during the adolescent years. School refusal, also known as school avoidance, is also notable as it has manifested as a symptom of multiple mental health disorders including anxiety. Regarding the role of demographic variables, gender is a significant factor as more females than males are diagnosed with anxiety disorders during adolescence. Little empirical research to date has looked at the impact of culture and ethnicity on the

prevalence rates of anxiety disorders among youth. Thus far, the prevalence of substance use and mental health disorders during youth, specifically depression and anxiety, has been discussed as well as the role of demographic variables within the occurrence of these disorders. In the following section, the links between mental health problems and substance use among high school students are reviewed.

Links between Mental Health Problems and Substance Use among Adolescents

Epidemiological studies consistently report high rates of comorbid mental health problems amongst adolescents with substance use disorders (SUD; Armstrong & Costello, 2002; Kandel et al., 1999; Rohde et al., 1996). Multiple studies have identified clear links between substance use and externalizing behavior problems such as conduct disorder, oppositional defiant disorder, and attention deficit hyperactivity disorder (Armstrong & Costello, 2002; Fergusson, Horwood, & Ridder 2007; King, Iacono, & McGue, 2004; Lillehoj, Trudeau, Spoth, & Madon, 2005; Young, Friedman, Miyake, Willcutt, Corley, Haberstick, & Hewitt, 2009). However, links between substance use and internalizing problems are less clear (King et al., 2004). In 2007, among youth between the ages of 12 and 17 who had experienced MDE in the past year, approximately 35% used illicit drugs during the same period when compared to 17% for youth who had not experienced MDE during the past year. This trend was also noticeable for rates of daily cigarette use and heavy alcohol use during the past month. Youth who had been diagnosed with MDE had higher rates of use (4.8% and 3.8%, respectively) when compared with youth who had not experienced MDE (2.3% and 2.2%, respectively; NSDUH, 2008). Some investigators have found that internalizing disorders such as depression and anxiety, particularly in females, are related to substance use (Chassin,

Pitts, DeLucia, &Todd, 1999; King et al., 2004). Notably, the behaviors and symptoms underlying substance use disorder, mood disorders (e.g., major depressive disorder), and anxiety disorders may contribute to each other, which has implications for understanding the development of these disorders as well as finding appropriate interventions (Valentiner, Mounts, & Deacon, 2004). The anxiety and mood disorders that are most co-morbid with substance use are major depressive disorder and social anxiety (Valentiner et al., 2004). However, the relationship between substance use and symptoms of most internalizing disorders including anxiety and depression is complicated because, as explained by Merrell (2008) "the problems may be both causes and effects of each other" (p.31).

Kaplow, Curran, Angold, and Costello (2001) utilized data from a subsample of children (*N*= 936) who participated in the Great Smoky Mountains Study of Youth. These youth were initially interviewed at ages 9, 11, and 13 years, and followed for four years. The Child and Adolescent Psychiatric Assessment (CAPA) was used in this study to assess substance use and psychiatric disorders (e.g., depression, generalized anxiety, and separation anxiety). No immediate relation was found between overall anxiety symptomalogy and the initiation of alcohol use. However, children with elevated levels of earlier generalized anxiety symptomalogy or depressive symptomalogy during the initial interviews were significantly more likely to initiate alcohol use later on.

Some studies have specifically looked at the relationship between cigarette smoking and mental health problems. Chang, Sherritt, and Knight (2005) studied 486 adolescents between the ages of 14 and 18 years; approximately two-thirds of the sample

were females. The researchers administered a 10-item questionnaire about participants' use of cigarettes, and other tobacco products, as well as the Adolescent Diagnostic Interview, which assesses substance use disorder and psychiatric symptoms (e.g., depression and anxiety) in the previous year. Current cigarette smoking was associated with significantly increased odds of having mental health symptoms. More specifically, girls smoking cigarettes reported more symptoms of depression and mania.

The relationship between depression and cigarette smoking was also examined by Vogel, Hurford, Smith, and Cole (2003) in a study of 98 adolescents ages 16 to 19 years. Approximately half of the sample (20 males and 20 females) smoked between one cigarette daily to a pack or more per day. The remaining 58 youth did not smoke. In order to measure the severity of depressive symptomalogy, the Multiscore Depression Inventory (MDI) was administered. Adolescents who received high scores on the total MDI were more likely to smoke, particularly adolescents who scored high on the subscales of helplessness and social introversion.

Regarding anxiety, Rohde et al. (1996) found a trend for increased alcohol use in girls who were diagnosed as having an anxiety disorders. Comeau, Stewart, and Loba (2001) also found that trait anxiety among adolescents, which the authors defined as the general tendency to experience anxiety symptomalogy, was a significant predictor of coping motives for cigarette smoking and alcohol use. On the other hand, a stronger relationship between substance use and externalizing behaviors (e.g., ADHD and conduct disorder) in males has been noted in the literature (Poulin, Hand, Boudreau, & Santor, 2005).

Regarding links between psychopathology and use of illicit drugs, Diego et al. (2003) studied 89 high school seniors and found that adolescents with high self-ratings of depressive symptomalogy measured via the CES-D (Radloff, 1977) were more likely to smoke cigarettes, drink alcohol, and smoke marijuana, but not more likely to use cocaine. This association between drug use and mental health problems is also found in other countries. For instance, Poulin et al. (2005) surveyed 12, 771 Canadian students with an average age of 15.1 years during 2002 and 2003. Depressive symptoms (measured via the CES-D) in males were associated with increased cannabis use but not alcohol or tobacco use, whereas depression was associated with elevated use of all three substances for females.

Some research has attempted to examine the factors that underlie psychopathology and the various reasons why these factors are associated with substance use. For instance, Comeau, Stewart, and Loba (2001) surveyed 508 adolescents from five secondary (junior and senior high) public schools. A total of 312 adolescents (61.4 % of the sample) reported using alcohol, 192 (37.8%) reported smoking cigarettes, and 154 (30.3%) reported using cannabis in the last year. Personality risk factors of trait anxiety and anxiety sensitivity were associated with alcohol, cigarette, and cannabis use; specifically, youth with these characteristics used substances in order to cope or conform.

Taken together, these studies have demonstrated that adolescent substance use often co-occurs with mental health problems, including depression and either GAD, social anxiety, or anxious personality traits. These studies demonstrate that comorbidity issues need to be considered when trying to understand the behaviors that adolescents are exhibiting and the emotions they are experiencing. More longitudinal research is needed

to understand the relationship between substance use and mental health problems such as anxiety and depression, as it is difficult to determine which problem behavior occurs first and whether these internalizing disorders are a cause or consequence of using substances. Furthermore, studies looking at a variety of substances (e.g., tobacco, alcohol, marijuana, cocaine, and ecstasy) are needed. The majority of studies have focused on one or two substances such as alcohol or tobacco. However, looking at a variety of substances and their relationship with internalizing disorders would allow comparisons between categories of substances (e.g., tobacco, alcohol, and marijuana). Additionally, more research is needed to examine links between substance use and mental health problems among low-SES high school students.

Relevance of Students' Substance Use and Mental Health to their Educational Functioning and School Services

Substance use problems and internalizing problems are not only associated with immediate symptoms such as difficulties in functioning and distress, but also long-term consequences with regard to increased psychopathology and substance use. Furthermore, many of these mental health disorders or symptomalogy usually onset during late childhood and adolescence. The school setting offers a natural and logical place to provide help and support to those at risk for developing mental health problems. School psychologists and other mental health professionals are uniquely prepared to help with mental health-related prevention and intervention efforts in the schools (Evans, Van Velsor, & Schumacher, 2002; Herman, Merrell, Reinke, & Tucker, 2004). In the following sections, links between students' mental health problems and academic achievement/performance, relationships between substance use and academic

achievement, as well as the role of school involvement as a possible protective factor in students' outcomes are discussed.

Links between mental health problems and academic achievement. According to Evans Van Velsor, and Schumacher (2002) "depression may be one of the most overlooked and under-treated psychological disorders of adolescence" (p. 211). In a survey of 1400 mental health professionals working in public high schools, depression and substance abuse issues were cited as the most serious challenges. Because adolescents with depression often demonstrate errors in information processing, Evans and colleagues (2002) purport that depression interferes with students' ability to concentrate and think quickly which causes school performance to decline. Depressed students' loss of interest in activities, disengagement from peers, as well as school refusal and absences have the potential to adversely impact their academic achievement (Bhatia et al., 2007). In a qualitative study on adolescents' experience of depression, in-depth interviews were conducted with five depressed adolescents between the ages of 13 and 17 years (Farmer, 2002). A major theme that was discussed by these adolescents was the deterioration in academic performance. They explained that this decline in performance was due to difficulties in concentration and comprehension. The constant fatigue as well as the lack of motivation also made it difficult to complete schoolwork. Furthermore, these adolescents expressed a loss in academic confidence and feelings of failure even though they had above average capabilities before their depression (Farmer, 2002).

Fergusson and Woodward (2002) examined adolescents between the ages of 14 and 16 with depression and the potential adverse psychosocial and educational impact that depression had during later adolescence and early adulthood. The data utilized in this

study were gathered as part of a longitudinal study entitled the Christchurch Health and Development Study. A total of 1265 children born in New Zealand participated in this 21-year longitudinal study. The data from the subsample of 964 youth without missing data were analyzed for this study. Between ages 14 and 16, depression was assessed using the self-report and parent versions of the Diagnostic Interview Schedule for Children. At ages 18 and 21, depression, anxiety, and alcohol abuse was measured using items from the Composite International Diagnostic Interview. Educational achievement was assessed using three indicators regarding the age when adolescents withdraw from school, their involvement in tertiary education, and enrollment in a university level or similar program. This allowed the researchers to obtain information on participants' high school dropout rate and higher education pursuit. At age 21, adolescents that were earlier diagnosed with depression had higher rates of school dropout and a reduced likelihood of enrolling in a university level program or another form of tertiary education. More specifically, of the participants who were diagnosed with depression between the ages of 14 and 16, approximately 26% reported leaving school prematurely as opposed to 17% for participants who were not diagnosed with depression. Furthermore, only 22% of participants with depression reported enrolling in a university as opposed to 32% for non-depressed participants.

It has also been demonstrated in the literature that adolescent anxiety negatively impacts academic performance and social functioning (Kessler, Foster, Saunders, & Stang, 1995; Van Ameringen, Mancini, & Farvolden, 2003). Students with anxiety disorders are more likely to doubt their academic competence which triggers continuous checking rituals and erasing when working on assignments, thus interfering with their ability to finish

assignments by deadlines (Albano et al., 2003). The time these students spend academically engaged is also affected, as the anxiety they experience in the classroom triggers overwhelming thoughts of worry which impede their concentration (Albano et al., 2003). Adolescents with anxiety disorders, especially social anxiety, are at greater risk for academic underachievement and dropping out of school (Kessler, et al., 1995).

Van Ameringen and his colleagues conducted a retrospective study that examined the percentage of individuals that left school prematurely, the reasons why these individuals dropped out of school when they were adolescents, and the degree to which anxiety disorders affected their school functioning as well as their decision to leave school. A total of 201 patients from an anxiety disorders clinic, between the ages of 18 and 65 years, completed a questionnaire that contained questions regarding their highest high school grade completed and reasons why they decided to leave school prematurely. Additionally, each participant was assessed using a structured clinical interview (SCID-DSM-IV; First, Spitzer, Gibbon, & Williams, 1995) and self-report questionnaires such as the Beck Depression Inventory (BDI; Beck, Ward, Mendelson, Mock, Erbaugh, 1961) and the State-Trait Anxiety Inventory (STAI; Spielberger, Gorsuch, & Lushene, 1970). Approximately 62% of participants had a primary diagnosis of panic disorder/agoraphobia, 24% had social anxiety, and 16% were diagnosed with OCD. Approximately half of the participants that were diagnosed with anxiety reported leaving school prematurely. Of the patients who reported dropping out of school, 22% reported feeling too nervous in school and in class. Furthermore, a third of the sample reported staying at home for an extended period of time due to their worries and feelings of anxiety. This study demonstrates the detrimental impact that anxiety problems can have on students' education. However limitations inherent to this

retrospective design include that participants were asked to recall information from high school.

In another study by Woodward and Fergusson (2001), the authors examined the relationship between anxiety disorders during adolescence (ages 14 to 16) and young adults' later risk for mental health, educational, and social outcomes. The authors analyzed the same data set presented in Woodward and Fergusson (2002). Between the age of 14 and 16 years, anxiety was assessed using the self-report and parent version of the Diagnostic Interview Schedule for Children; diagnoses were based on the DSM-III-R criteria for anxiety disorders. At ages 18 and 21, anxiety and alcohol abuse were measured using items from the Composite International Diagnostic Interview. Educational outcomes were measured as in Woodward and Fergusson (2002). The authors found significant linear relationships between the number of diagnosed anxiety disorders between the ages of 14 and 16 and the pursuit of higher education (ages 18 to 21). Of adolescents who were not diagnosed with an anxiety disorder between the ages of 14 and 16, approximately 34% of them enrolled in a university level program; compared to 26% of adolescents diagnosed with 1 anxiety disorder, 19% with 2 anxiety disorders, and only 13% of adolescents with 3 or more anxiety disorders. Furthermore, associations between earlier anxiety disorder (ages 14 to 16) and later development of mental health disorders (e.g., anxiety and depression) and illicit drug dependence in young adulthood were noted in this study.

Taken together, these studies demonstrate not only the short-term negative impact that internalizing disorders such as depression and anxiety have on adolescents' academic achievement and educational outcomes, but also the long-term consequences that these psychological problems can have on young adults' pursuit of higher education. Substance

use has also been found to have deleterious impact on the academic achievement and school functioning of youth.

Links between substance use and academic achievement. Diego and colleagues (2003) examined the relationships between adolescent substance use, academic performance, popularity, and depression among 89 high school seniors. This study was conducted in a primarily middle SES high school in Florida. As for substance use, students were asked to answer on a scale from 1 (*never*) to 4 (*regularly*) how often they used cigarettes, alcohol, marijuana, and cocaine in the past year. Academic performance was measured using students' self-report of their grade point average (GPA). The researchers found that adolescents who engaged in substance use were more likely to have a lower GPA.

Substance use has also been associated with lower school attendance (Engberg & Morral, 2006). The researchers used data gathered for the Persistent Effects of Treatment Study-Adolescent (PETS-A) and used a subsample of 1, 084 adolescents between the ages of 12 and 19 years. PETS-A is a longitudinal study that examined the psychosocial outcomes of youth admitted to a substance abuse treatment. Participants were first assessed prior to entering treatment (baseline) and 3, 6, 9, and 12 months follow-up assessments were conducted after baseline. A structured clinical interview, the Global Appraisal of Individual Needs, was administered to all participants. This interview gathers information on factors such as substance use, physical health, and mental health. To assess school status, a single question was asked to participants: which of the following statements best describes your present work or school situation? Answers to this question indicated whether or not the adolescent was currently in school at the time

of each assessment interval. Findings suggest that reductions in the frequency of alcohol, stimulants, and other drug use were associated with an increase in the likelihood of school attendance. Interestingly, a reduction in the use of marijuana was not enough to significantly and positively impact school attendance. However, the secession of marijuana use was associated with an increase likelihood of attending school.

In addition to adverse effects on academic performance and school attendance, adolescents who engage in substance are more likely to quit school before high school graduation (Aloise-Young & Chavez, 2002). Aloise-Young and Chavez (2002) examined the reasons why adolescents decide to drop out of school. A total of 1, 812 youth between the ages of 13 and 21 participated in this study. Approximately half of the participants were males (53%), half were school dropouts, and 63% were Mexican American youth. Substance use was measured using the Clinical Drug Assessment Scale from the American Drug and Alcohol Survey (ADAS; Oetting, Beauvais, & Edwards, 1990). Frequency and intensity of alcohol, marijuana, and cocaine use was assessed in the ADAS. Regarding reasons for leaving school, participants were given a list of various reasons for dropping out of school and asked to rate these reasons. Some of these reasons included factors such as school bonding, family, friends, grades, and substance use. Approximately 30% of participants reported that their use of substances was a significant contributor to their decision of dropping out of school.

Taken together, these studies demonstrate that the use of substances during adolescence has detrimental effects on youths' educational functioning, and these negative effects have been found to be both short-term (e.g., lower GPA, poor school attendance) and long-term (e.g., higher likelihood of dropping out of school, reduced likelihood of

pursuit of higher education). Furthermore, these studies demonstrate a need for school psychologists and other school-based mental health providers to develop prevention and intervention programs that address internalizing disorders and substance use in order to help students achieve their highest academic potential and integrate them in the school. Kessler et al. (1995) reported that in the United States, persons with psychiatric disorders account for 14.2% of high school dropouts which further shows that these students need to be proactively involved in the school experience, and in particular need to feel connected to their school, peers, teachers, and school-based mental health providers. Engaging in school-based extracurricular activities might be one way that students at risk for experiencing mental health problems might feel more connected to their school and peers. As is discussed in the following section, participation in such activities might also help serve as a buffer against substance use among students with internalizing disorders.

Role of school involvement as a protective factor in students' outcomes.

Extracurricular activities and academic performance have been identified as protective factors that reduce the likelihood of substance use during adolescence (Diego, Field, & Sanders, 2003; Sutherland & Shepherd, 2001). On the other hand, adolescents who are not committed to school and who have weak academic records are more likely to use alcohol and drugs, both concurrently and in the future (Bogart, Collins, Ellickson, & Klein, 2006; Bryant, Schulenberg, O'Malley, Bachman, & Johnston, 2003). School-based extracurricular activities provide a highly structured environment for adolescents in which they can express their identity and develop a social network while being monitored for deviant or delinquent behaviors (Darling, 2005). Thus, school involvement in the current study is defined as participation in school-based extracurricular activities such as

sports, performance and fine arts, and academically oriented activities (e.g., student government, language). Mahoney and Stattin (2000) defined highly structured activities as consisting of "regular participation schedules, rule-guided engagement, direction by one or more adult activity leaders, an emphasis on skill development that is continually increasing in complexity and challenge, activity performance that requires sustained active attention, and clear performance feedback" (p. 114-115). School-based extracurricular activities meet the criteria for a highly structured leisure environment. Such school-based extracurricular activities are differentiated from unsupervised activities outside of school or activities that are not performed on a regular basis.

A growing body of research suggests that adolescents' involvement in school-based extracurricular activities is associated with fewer adjustment problems and may protect against psychopathology and substance use (Bohnert & Garber, 2007; Eccles & Barber, 1999; Fredricks & Eccles, 2006). Bohnert and Garber (2007) examined whether higher levels of organized activity involvement predicted lower levels of psychopathology, as well as which type of activity involvement predicted lower levels of symptomalogy. A total of 198 adolescents participated in this study. They were first assessed in sixth grade and further assessed annually through twelfth grade. At the time of the first assessment participants were, on average age, twelve years old; the majority of the sample (82%) was Caucasian. A semi-structured interview was conducted using the Schedule for Affective Disorders and Schizophrenia for School-Age Children-Present and Lifetime Version (K-SADS-PL; Kaufman et al. 1997) to gather information on substance use and psychiatric disorders. The Child Behavior Checklist (CBCL; Achenbach, 1991) was also administered to participants' mothers to further assess

internalizing and externalizing symptomalogy. To assess adolescents' involvement in school-related and community-based activities, the Adolescent Activity Involvement Inventory (AAII) was developed by the authors and administered to participants' mothers. This checklist asked mothers to indicate in which activities youth were involved during sixth through twelfth grade, with regard to seven extracurricular activities categories (sports, performance/fine arts, prosocial, academic clubs, school involvement such as cheerleading, press, and leadership such as student government). The authors found that involvement in organized activities was associated with lower levels of externalizing disorders, less tobacco use and fewer diagnoses of substance use disorder in twelfth grade. However, no relationship between involvement in organized activities and lower levels of internalizing symptoms was indicated.

Peck, Roeser, Zarrett, and Eccles (2008) examined how extracurricular activity involvement contributes to what they referred to as "educational resilience". In this longitudinal study, ninth grade participants (N = 1, 060) were asked to complete a 1-hour interview and a questionnaire. At the end of eleventh grade, the participants (N = 1, 057) were again individually interviewed and completed a questionnaire. One-year follow up (19 years old) and 3-year follow ups (21 years old) were conducted after the expected high school graduation date of participants. Approximately half (49%) of the participants were female and more than half (60%) were African American. The authors examined how the total amount of time that vulnerable youth (i.e., students at risk for dropping out of the educational system due to their levels of emotional distress, lack of motivation, poverty, and lower levels of parental education) spent in positive extracurricular activities, and how specific patterns of extracurricular activity involvement during late

adolescence, contribute to educational attainments. Activity involvement was assessed using a measure developed by Eccles and Barber (1999) which asked, in terms of frequency, engagement in extracurricular activities in the past year such as school athletic teams, school clubs, community club, volunteer services, spending time with friends, and watching television. The authors found that vulnerable adolescents who were involved weekly in activities such as sports and other school clubs had greater educational resilience and higher rates of later college enrollment whereas engaging in activities such as watching television and hanging out with friends were less likely to lead to educational resilience.

Darling (2005) examined whether involvement in school-based extracurricular activities was associated with students' substance use, depression, school grades, academic goals, and positive attitudes towards school. The data used for this study came from a 3-year longitudinal study of 3, 761 adolescents from six high schools in California that were diverse in terms of school size, socioeconomic background, and ethnicity of students (although the majority of the sample was Caucasian). To assess participation in school-based extracurricular activities, students were asked to report during the first two years of the project what was the single most important school-based activity in which they were involved during the year. During years 1 and 2, students were classified as participants if they named a valid school-based extracurricular activity. During the third year of the project, students were given a list of 21 school-based extracurricular activities and asked to report their levels of participation for each. During year 3, students were classified as participants if they were engaged in at least one of the school-based activities listed. Regarding depression, a short version (8 items) of the CES-D scale was

used to measure depressive symptomalogy. To assess substance use, adolescents reported, on a 4-point scale, how often since the beginning of the school they had used alcohol, used cigarettes or chewing tobacco, smoked marijuana, and/or used a drug other than marijuana. Finally, students' academic achievement and aspirations were measured using three indicators: self-report of their school grades, attitudes towards school using a 6-item scale developed for the study, and academic goals using one question: "Considering your situation, what is the highest level that you really expect to reach in school?" Results indicated that students who were involved in school-based extracurricular activities were less likely to use substances other than alcohol (e.g., tobacco, marijuana, other illegal drugs). Important to this study, Caucasian students were the most likely to engage in school-based extracurricular activities (60%), while Hispanic-American students were the least likely to participate in such activities (39%). Furthermore, involvement in such highly structured activities was associated with more positive academic outcomes (e.g., better performance in school, more positive attitudes towards school, and the tendency to remain in school longer), and buffered students who experienced stressful life events from developing problematic outcomes (e.g., marijuana and hard drug use, reduced academic goals). However, there was no significant relationship between adolescents' involvement in school-based extracurricular activities and depression. Limitations of this study include the failure to examine if involvement in structured activities serves as a moderator in the relationship between depressive symptomalogy and substance use. Moreover, the researchers used a modified 8-item version of the CES-D scale which might have affected the validity and reliability of the measure.

In sum, research has demonstrated that adolescents' participation in extracurricular activities in the schools is linked to lower substance use, as well as more positive academic outcomes and fewer externalizing problems. However, the relationship between involvement in such activities and mental health problems has not been extensively studied. In particular, not much research has looked at the relationships between adolescent substance use, internalizing disorders (i.e., anxiety and depression), and engagement in school-based extracurricular activities among low-SES students.

Conclusions

Substance use by adolescents adversely impacts various aspects of their lives such as their academic outcomes and educational attainment (Diego et al., 2003; Engberg & Morral, 2006; King et al., 2006), health (The National Survey on Drug Use and Health, 2008), and socio-emotional functioning (The National Survey on Drug Use and Health, 2008). Furthermore, the prevalence of substance use during adolescence is very high; almost 75% of adolescents consume alcohol before twelfth grade, approximately half of American youth have tried cigarettes before the end of high school, and approximately 35% of twelfth grade students have used illicit drugs (Johnston et al., 2007). Substance use is usually initiated during early adolescence and generally begins with substances such as tobacco and alcohol, followed by illegal drugs such as marijuana (Diego et al., 2003; Kandel, Yamagushi, & Chen, 1992; The National Survey on Drug Use and Health, 2008). Demographic variables such as gender, SES, and ethnicity/race can influence the rate of substance use as well as the choice of substance used (Amaro et al., 2001; Bettes et al., 1990; Johnston et al., 2007; Luthar et al., 2005; Parker et al., 2000; Piko, 2006; Wagner et al., 2007; Wallace et al., 2003).

Furthermore, it has been demonstrated in the literature that many adolescents experience psychological problems, with depression and anxiety being two of the most common internalizing disorders (Albano et al., 2003; Costello et al., 2005; Huberty, 2008; Rushton et al., 2002). Current estimates suggest that approximately 15-20% of youth have levels of anxiety and depressive symptomalogy that warrant intervention (Huberty, 2008). The prevalence of depression and depressive symptomalogy in youth ranges from 1% and 18% (Costello, Egger, Angold, 2005). As for anxiety, prevalence rates range widely, from 2% to 33% of children and adolescents (Costello, Egger, & Angold, 2005). Internalizing disorders such as depression and anxiety adversely affect important aspects of youths' lives such as their self-esteem, substance use behavior, academic performance, and social interactions (Merrell, 2008). In addition to depression, the current study examined the specific anxiety disorders of GAD and social anxiety due to their high prevalence during adolescence (Costello et al., 2005). School refusal is also an important focus of the current study as it is a symptom in multiple anxiety disorders, including GAD, social anxiety, and specific phobia. Of importance, demographics characteristics such as gender and SES have been found to impact not only the rates of prevalence but also the expression and the severity of anxiety and depressive symptomalogy (Angold et al., 1999; Cooley, 2004; Costello et al., 2006; Lewinsohn et al., 1998; Manassis et al., 2004; Roberts et al., 1997; Rushton et al., 2002; The National Survey on Drug Use and Health, 2008).

Additionally, several studies have identified links between internalizing mental health disorders and substance use (e.g., alcohol, cigarette, and marijuana) during adolescence. However, it is unclear which problem behavior occurs first or whether the

relationship is bidirectional. Preventing and ameliorating these mental health problems is important in part due to the deleterious academic outcomes of youth with internalizing disorders and/or substance use histories (Albano et al., 2003; Bhatia et al., 2007; Evans et al., 2002; Farmer, 2002; Kessler et al., 1995; Van Ameringen et al., 2003). School psychologists and other school-based mental health providers have the opportunity to participate in efforts to prevent and treat problems such as substance use, anxiety, and depression. Several researchers have found that adolescents who are involved in school-based extracurricular activities, that are characterized by structure and supervision while at the same time allowing youth to socialize and express their identity, are less likely to use substances and demonstrate externalizing behavior problems. Involvement in such activities has also been associated with better educational outcomes (Bohnert et al., 2007; Darling, 2005; Eccles et al., 1999; Fredricks et al., 2006; Peck et al., 2008). Links with internalizing forms of psychopathology, such as depression and anxiety, are less clear and in need of further study.

Purpose of the Current Study

Given that research has demonstrated that the use of substances and the presence of mental health problems, such as depression and anxiety, are common during adolescence, it would be valuable to identify prevalence rates of substance use (e.g., alcohol, cigarettes, and marijuana) as well as prevalence rates of anxiety and depressive symptomalogy in a low SES population with a primarily Hispanic student population. Thus, the current study examined the use of substances, as well as levels of internalizing symptoms of depression and anxiety, among students in a predominately low-SES high school, attended primarily by Hispanic students. The current study also examined the

links between anxiety and depressive symptomalogy and substance use among this population. Thus the specific relationships that exist between mental health problems and substance use among a predominantly Hispanic and economically disadvantaged high school student population were examined in order to determine if correlations similar to the ones identified in the literature would be found. In other words, these links were examined in order to determine if findings from previous studies generalize to this specific population of high school students.

To date, research on the relationship between mental health problems, involvement of adolescents in school-based extracurricular activity, and substance use among adolescents has been limited. Furthermore, when looking at the relationship between substance use and internalizing disorders such as depression and anxiety, the majority of studies have focused on only one or two specific substances (i.e., tobacco or alcohol). As a result, research has not comprehensively examined substance use, mental health disorders, and engagement in school-based activities to determine if for adolescents experiencing mental health problems, engagement in school-based extracurricular activities (e.g., athletics, music, dance, student government, and social clubs) serves as a protective factor for substance use. The current study purposefully examined the relationships between all these variables. Specifically, the current study determined if school involvement moderates the relationship between mental health issues and substance use, such that involvement in school-related activities buffers students experiencing mental health issues from using substances. A moderator variable is defined as a variable that has an impact on the relationship between another independent variable (e.g., depression) and the dependent variable (e.g., substance use),

so that the nature of the impact of the independent variable on the dependent variable fluctuates or changes based on the level of the moderator (e.g., involvement in school-based extracurricular activities). In other words, this variable has an impact on the strength or direction of the relationship between an independent variable and the dependent variable (Baron & Kenny, 1986; Holmbeck, 1997). Information regarding the effect of involvement in school-based extracurricular activities on the relationship between mental health problems and substance use is crucial to develop and implement effective preventive programs for youth.

Chapter Three

Method

This chapter begins with a discussion of the participants involved in this study, as well as the methods used to select participants. The procedures for data collection are then discussed, including a review of the measures used to collect data. Finally, the variables that are examined in this study, as well as an overview of analysis procedures used, are presented.

Overview of Setting

Participants included in the dataset that was analyzed in the current study were adolescents enrolled in grades nine through twelve at a local high school. The high school that participated in this study is a public school in a large school district. This particular school was selected for participation for the following reasons: considerable ethnic diversity of the student population, including a large number of Hispanic youth, (b) high number of students who are economically disadvantaged, and (c) ongoing facilitative relationship between the university research team and the school; in particular, the primary investigator of the larger study had close ties with the high school and was able to influence study design in such a way that the research yielded meaningful information for the participating high school.

The dataset analyzed in the current study was yielded from a larger study investigating the rate of substance use (e.g., alcohol, tobacco, marijuana, and other illicit drugs) of high school students in relation to various factors that can impact students'

education such as their perception of relationships with classmates and close friends, their participation in school-related extracurricular activities and organizations (e.g., dance, athletics, student government, music, language clubs, and honor societies), and their mental health. Thus, the author of this study conducted a secondary analysis of an archival dataset. Of note, the author was an instrumental member of the research team that designed the study and collected the data.

The local high school that participated in the larger study is considered to be a predominantly low SES school, with approximately 60% of the students receiving free or reduced lunch and 75% of students qualifying as economically disadvantaged (Hillsborough County Public Schools 2008-2009 School Improvement Plan, 2008). This high school population is also predominantly Hispanic, with 65% of students classified as such. Approximately 18 % of the student population is Caucasian and 10% is African American. There are 1780 students enrolled at this Title I school (Hillsborough County Public Schools 2008-2009 School Improvement Plan, 2008). The total graduation rate for the 2008-2009 year in this school was 57.5%, considerably lower than the rate of 76.3% for the school district and 69.8% for the state average (Florida Differentiated Accountability Program 2008-2009 School Improvement Plan, 2008).

Selection of Participants

Certain groups of students were intentionally excluded during data collection. In particular, English Language Learners who were not enrolled in an English course were excluded due their potential limited proficiency in the English language which might affect their ability to comprehend and complete the survey. Students exclusively served in self-contained special education classrooms were also excluded due to a higher

incidence of reading difficulties and higher risk of experiencing socio-emotional/ behavioral problems while completing the self-report questionnaire. To ensure that only students who fit the criteria for participation were included in this study, parental consent forms were delivered only to students enrolled in English courses. Only students who returned the informed consent form with the signature of a parent or a legal guardian were allowed to participate in this study. Students were not paid for their participation. However, incentives were offered to increase the participation rate at the school. Specifically, students were informed that names of students who returned signed parent consent forms would be entered in a raffle to win one of four fifty-dollar gift cards redeemable at Best Buy. A total of 139 high school students who returned the signed parent consent forms and signed the child assent form participated in the current study. This equates to a 10.3% response rate of student participation within the sample targeted for participation (N = 1353). The demographic characteristics of the sample along with the demographic characteristics of the entire school population are presented in Table 1.

Table 1

Descriptive Statistics for Sample (n = 138) and School Population (n = 1780)

Variable	Sample %	School Population %
Gender		
Male	25.8	48
Female	74.2	52
Ethnicity		
Hispanic	51.5	65
Caucasian	25	17.64
African-American	9.1	9.55
Asian	6.8	1.74
Multiracial	7.6	5.79
Grade		
9^{th}	31.3	31
10^{th}	21.4	27.9
11^{th}	22.1	22.7
12^{th}	25.2	18.4
Economically Disadvantaged		
Yes	68.9	75.06
No	31.1	24.94

Note. Students meeting the economically disadvantaged category were determined by having students indicate whether or not they received free or reduced lunch.

Procedures

Approval to conduct the larger study was obtained from the University of South Florida (USF) Institutional Review Board (IRB) in August of 2008. Approval from the IRB ensures that all the necessary safety measures are followed to protect participants' rights. Approval was also obtained from the school district as well as the local high school in which the study was conducted. A faculty member of the school psychology

program at the University of South Florida was the primary investigator (PI) of the larger study and supervised the data collection process.

Prior to data collection, a small pilot study with students attending the high school was also conducted to explore readability issues, time needed to complete the measures, and the clarity of the survey as well as specific self-report measures. The first pilot study involved approximately 20 students enrolled in an honors psychology class. Students did not encounter difficulties filling out the questionnaire and had no questions regarding readability. Time of completion was approximately 20-30 minutes. A second pilot study was conducted due to concerns about the representation of students in the first pilot study. The second pilot testing was conducted with 56 students from a general education English class. Similar to the first pilot study, no questions regarding readability were reported by participants and surveys took approximately 25 to 30 minutes to complete. All surveys completed during the two pilot studies were filed in a cabinet and data were not recorded.

Prior to data collection, the PI of this larger study distributed letters that described the study within an informed consent form to all students who met the inclusion criteria. Students whose parents' native language was Spanish were distributed the information and informed consent forms in both English and Spanish. Active parental consent was a requirement and parents were required to sign and return the consent form in which the potential risks and benefits associated with participation in this study were explained. The parental consent form is included in Appendix A.

Data collection took place in October of 2008; the PI and four members of the research team (including the author of this document) were involved in this process. The

PI compiled a list of all students who had returned signed parental consent forms prior to data collection. Hall passes were printed for all eligible participants which gave them permission to leave their classroom to participate in the study. The PI called the participating students by classroom to a large conference room located in the school building. Students completed the surveys in a small group format and data were collected on several dates during a one week period. The researchers were careful to leave sufficient space between each student to provide adequate privacy, as the surveys were anonymous.

Prior to handing out the surveys, risks and benefits associated with participating in the study were explained to each participant and the student assent form was read aloud to each participant. At this time, students were allowed to ask the researchers any questions they had about the study and their involvement. Then, participants were required to complete the student assent form which outlined ethical considerations such as their right to decide whether they wanted to participate in the study or not and their right to withdraw from the study at any point in time during the course of data collection. All signed student assent forms were collected and kept in a box separate from surveys in order to maintain the confidentiality of survey answers as well as students' identities. After the student assent forms were signed, surveys packets were handed out to all students. In order to control for order effects, all survey measures included in packets were counterbalanced using versions "A" through "D". The student assent form is included in Appendix B.

The PI and research assistants circled the room during the administration of surveys; participants were reminded to ask questions if any items were unclear or

ambiguous. As participants returned the completed surveys, a member of the research team looked quickly for accidently skipped or unanswered sections. However, the members of the research team were careful not to analyze the content of the survey in order to respects the participants' privacy. Members of the research team signed the pass that had given students permission to leave their classroom to participate in the study, and students were asked to return directly to their classroom. Students were calm and cooperative throughout the data collection process. Data were entered during the month of October 2008 and members of the research team randomly checked 15% of the data (N = 21) for errors. Approximately 99.9% of data had been entered correctly initially; the few errors were corrected immediately.

Measures

Demographics questionnaire. Students completed a demographics questionnaire in order for the researchers to gather information about the personal characteristics of the students in this study. Participants reported their gender, ethnicity, age, grade, estimated GPA, and whether or not they receive free or reduced lunch. The specific form used to collect this information is included in Appendix C.

Teen Alcohol and Drug Use Scale (TADUS; Harbor, 2008). In order to measure how often participants used various substances, participants completed an 18-item self-report questionnaire assessing the frequency of adolescents' alcohol and substance use. The TADUS is included in Appendix D. Item 18 was open-ended and provided participants the opportunity to note the use of any other substances that were not included in the questionnaire. This questionnaire was developed by the PI of the larger study, and members of his graduate research team. This measure was developed to include a more

comprehensive list of substances; however the measure was based on the one used in the Monitoring the Future study which is conducted annually (Johnston et al., 2007). The TADUS consists of a list of substances (e.g., cigarettes, beer, liquor, marijuana, cocaine, crack) that participants indicate they have used during the past year. Responses can range from 1 (*zero occasions*) to 7 (*40 or more occasions*). The metric of occasions was chosen as it was the one used for the Monitoring the Future study which has been shown to have sound psychometric properties (Johnston et al., 2007). For the purpose of this study, substances were classified into three distinct categories: alcohol, cigarettes, and marijuana. Alcohol use included the sum total of items involving (a) wine, wine coolers, or malt beverages (e.g., Smirnoff), (b) beer, and (c) liquor (e.g., vodka, rum, whiskey). Studies were conducted to assess the reliability of the TADUS and the reliability was established using Cronbach alpha coefficients. The reliability test was based on the data gathered during the pilot study and the coefficient for the entire scale was .82. In the current study, Cronbach alpha for the alcohol composite was satisfactory ($\alpha = .77$).

Center for Epidemiological Studies Depression Scale (CES-D; Radloff, 1977). The CES-D is a 20 item self-report survey that was developed for use in studies of the epidemiology of depression. The CES-D is included in Appendix E. It was designed to measure depressive symptomatology in the general population and it is not intended to provide a clinical diagnosis of depression. Individuals completing this self-report questionnaire are asked to indicate on a 4-point scale, with responses ranging from 0 (*rarely or none of the time)* to 3 (*most or all of the time*), the frequency with which they experienced various behaviors and emotions during the past week (e.g., “I have trouble keeping my mind on what I was doing”, “I thought my life had been a failure” and “I felt

lonely"). Four of the items on the CES-D are worded positively to also assess positive affect (e.g., "I felt hopeful about the future" and "I was happy"); these items break the pattern of responses and are reversed scored. Total scores can range from 0 to 60 with higher scores indicating the presence of more frequent depressive symptoms. Scores of 16 or higher are identified as at-risk for a clinical diagnosis of depression. If a total of four items or more are missing, the CES-D scale should not be used (Radloff, 1977).

The CES-D has high internal consistency with a coefficient alpha of .85 (Radloff, 1977). The internal consistency for the CES-D in the current simple was also high and almost identical to Radloff's (1977), with a coefficient alpha of .86. In prior research (Radloff, 1977), test-retest reliability correlation was the highest (.67) across a 4-week interval and lowest (.49) across a 12-month interval. Higher correlations were not expected as the scale is designed to measure current levels of depressive symptomalogy (during the past week). However, it should be noted that, in general, higher correlations were observed in participants that had shorter test-retest intervals (2 to 8 weeks) than the ones that had longer test-retest intervals (3 to 12 months).

Factor analyses were conducted to assess the construct validity of the CES-D in both adult and adolescent samples (Phillips, Shadish, Murray, Kubik, Lytle, & Birnbaum, 2006; Radloff, 1977). The CES-D was found to measure four facets of depression: depressed affect (e.g., lonely, blues, sad), positive affect (e.g., hopeful, happy, enjoy), somatic and activity level (e.g., bothered, effort, appetite, sleep), and interpersonal (e.g., unfriendly, dislike). Studies assessing construct validity of the CES-D across race/ethnicity were also conducted (Posner, Stewart, Marin, & Perez-Stable,

2001). Posner and colleagues found the four-factor model proposed by Radloff provided an adequate fit to the data for Latino women but not for Latino men.

Evidence for the criterion validity of this measure is provided through its positive correlation with other instruments measuring depressive symptomalogy (e.g., Bradburn Negative Affect, and Bradburn Balance; Radloff, 1977). Evidence for convergent validity is also provided due to its positive correlation with the Children's Depression Inventory (r = .58) in a study in which a total of 1207 students in grades 4 through 12 participated (Doerfler, Felner, Rowlison, Raley, & Evans, 1988). Even though the CES-D's convergent validity has not been thoroughly examined and compared to more recent measures such as the Beck Depression Inventory-2nd Edition, the Children's Depression Inventory, or the Reynolds Adolescent Depression Scale-2nd Edition, the CES-D has been used innumerous studies examining depression symptomalogy among adolescents. With regards to factorial validity, each item on the CES-D is correlated more highly with the CES-D total score than with the Rosenberg Self-Esteem scales, or the Spielberger's State-Trait Anxiety Inventory total scores (Orme, Reis, & Herz, 1986).

Screen for Child Anxiety Related Disorders (SCARED; Birmaher, Khetarpal, Cully, Brent, & McKenzie, 1997). The SCARED is a 41 item self-report survey that was developed to measure general anxiety symptomalogy among youth (Birmaher et al., 1997). This self-report measure was designed to screen for five different anxiety disorders: generalized anxiety disorder, separation anxiety disorder, panic disorder, social anxiety, and school avoidance. Individuals completing this self-report questionnaire are asked to indicate on a 3-point scale, with responses ranging from 0 (*not true or hardly ever true*) to 2 (*very true or often true*), the degree to which they experienced various

behaviors and emotions during the last 3 months (e.g., “I worry about things working out for me”, “I feel nervous with people I don’t know well, and “I am scared to go to school”). The SCARED is included in Appendix F.

For the purposes of this study, a total of 20 items measuring three of the five factors (generalized anxiety disorders, social anxiety disorders, and significant school avoidance) were administered. For the nine items measuring generalized anxiety symptomalogy, scores can range from 0 to 18, with a score of 9 or above indicating a student is at-risk for a clinical diagnosis of generalized anxiety disorder. For the seven items measuring social anxiety, scores can range from 0 to 14, with a score of 8 or above indicating a student is at-risk for a clinical diagnosis of social anxiety disorder. Finally, a total of four items are used to identify students who are at risk for experiencing significant school avoidance. Scores can range from 0 to 8 with scores of 3 or higher indicating a significant risk for experiencing significant school avoidance. However, a specific number of missing items allowed for each factor or the total scale to be considered valid was not indicated by the authors of the scale.

The developers of the SCARED initially presented the psychometric properties of the 38-item original scale in 1997. Construct validity was assessed and the SCARED yielded five factors: somatic/panic, general anxiety, separation anxiety, social anxiety, and school avoidance (Birmaher, Khetarpal, Cully, Brent, & McKenzie, 1997). The construct validity of the SCARED was also examined in another study using an ethnically diverse sample; the five-factor structure identified by Birmaher et al. (1997, 1999) was found to be the best fit for this sample (Hale, Raaijmakers, Muris, & Meeus, 2005).

In addition, the SCARED demonstrated good criterion validity as the total score was positively correlated with other scales measuring anxiety symptomalogy such as the MASC (r = .61) and the RCMAS (r = .65; Boyd, Ginsburg, Lambert, Cooley & Campbell, 2003). Discriminant validity, both within the five anxiety disorders and between anxiety disorders and other psychiatric disorders (disruptive disorders and depression), was also demonstrated (Birmaher et al., 1997). However the social factor did not discriminate well between patients with social anxiety and other anxiety disorders. A replication study was conducted using a new clinical sample of youth to assess the psychometric properties of a modified 41-item version of the SCARED in which 3 items were added to the social anxiety subscale to increase the discriminant validity (Birmaher, Brent, Chiappetta, Bridge, Monga, & Baugher, 1999).

In terms of reliability, the 41-item total SCARED scale has high internal consistency (coefficient alpha= .90). For each of the five factors, the revised version of the SCARED also demonstrated good internal consistency with coefficients ranging from .78 to .87 (Birmaher et al., 1999). Test-retest reliability across a 4-day to 15-week interval, with a median of 5 weeks, was also high ranging between .70 and .90 for the five individual factors and .86 for the total score (Birmaher et al., 1997). The internal consistency and test-retest reliability of the 41-item version of the SCARED was also assessed in an African-American adolescent sample, in which a total of 35% of the student population lived below the poverty level (Boyd et al., 2003). In this sample, the SCARED yielded borderline to excellent internal consistency with a coefficient alpha of .89 for the total scale and coefficient alphas ranging between .56 (School Avoidance) and .80 (Generalized Anxiety and Social Anxiety) for each of the three subscales used in the

current study. The internal consistency for the generalized anxiety and social anxiety subscales in the current sample were comparable to the coefficient alphas obtained in previous studies looking at the psychometric properties of the SCARED. Coefficient alpha for the generalized anxiety subscale was .82, and .80 for the social anxiety subscale. In the current sample the internal consistency for the school avoidance subscale was poor (.38), and lower than the values obtained in previous research (Birmaher et al., 1997; Boyd et al., 2003). In prior research, test-retest reliability over a period of six months for the total score was .47 (Boyd et al., 2003). Test-retest reliability for each of the three subscales used in the study conducted by Boyd and colleagues (2003) was .36 (School Avoidance), .47 (Social Anxiety), and .48 (Generalized Anxiety). In general, support for the reliability of the school avoidance subscale appears weakest.

Participation in School-Related Activities Questionnaire (PSRAQ; Harbor, 2008). A total of fourteen items on the survey asked questions concerning students' involvement in school- related activities and organizations (e.g., dance, music, athletics, drama, student government). Item 14 was open-ended and provided participants the opportunity to note any other involvement in school-related activities that were not included in the questionnaire. The PSRAQ is included in Appendix G. Responses range from 0 (*never*) to 5 (*three or more times a week*). This scale was also developed by the PI of the larger study and other members of the research group. Because the measure is new, its reliability and validity have not been previously examined. In order to evaluate the internal consistency reliability of the PSRAQ, Cronbach alpha coefficients were calculated for each cluster created for use in the current study.

Consistent with prior research (e.g., Bohnert & Garber, 2007; Darling, 2005; Peck, Roeser, Zarrett, & Eccles, 2008), clusters representing mean involvement in various types of activities were analyzed in the current study. To determine which of the items on the PSRAQ constitute each cluster, an exploratory factor analysis (EFA) was conducted using 12 items from the PSRAQ. The two items that were excluded were items 14 ("other") and item 3 which assessed involvement in athletic activities; consistent with prior research (e.g., Bohnert & Garber, 2007; Darling, 2005), athletic involvement was purposefully analyzed separately (i.e., a 1-item indicator).

The results of the EFA suggested the presence of four factors, each with eigenvalues exceeding 1.0. However, only two items loaded sufficiently (i.e., factor loadings at or above .30) on the fourth factor (eigenvalue = 1.09, % of variance = 9.14); thus, this factor was not retained for further analyses. Of the two items that loaded on this fourth factor, one (school publications) loaded sufficiently on another factor, and the second (ROTC) did not relate to any other item. Therefore, the low-frequency activity of ROTC was excluded from further analysis.

Factor one (eigenvalue = 2.92, % of variance = 24.35) consisted of four items that involved prosocial and academically-oriented activities. The internal consistency for the four items (i.e., community service, student government, language, and academic clubs) on this factor, referred to as prosocial/academically-oriented activities throughout the remainder of the study, was .62. Factor two (eigenvalue = 1.50, % of variance = 12.47) consisted of four items that involved special interests activities. The internal consistency for the four items (i.e., school publications, business/career, social clubs, and hobby clubs) on this factor, referred to as special interests clubs throughout the remainder of the

study, was .53. Factor three (eigenvalue = 1.28, % of variance = 10.63) consisted of three items that involved performing arts activities. The internal consistency for the three items (i.e., music, drama, and dance) on this factor, referred to as performing arts throughout the remainder of the study, was .58.

In sum, for the purpose of this study, school involvement was classified into four distinct categories: athletic activities, performing arts (i.e., music, drama, and dance), prosocial/academically oriented activities (i.e., academic clubs, language, student government, and community service), and special interests clubs (i.e., school publication, hobby clubs, social clubs, and business/career).

Variables

The measures discussed previously were employed as indicators of the variables relevant to this study. Some of the variables such as rate of substance use and mental health problems are bidirectional and can be conceptualized as either independent or dependent variables. However, this study examined substance use as an outcome variable.

Independent. Several independent variables were studied. The first set of variables involve information on demographic characteristics of the participants, more specifically, gender (0= Male; 1= Female), socioeconomic status (1= receiving free/reduced lunch; 2= not receiving free/reduced lunch), and ethnicity/race (1= African American/Black; 2= Asian/Pacific Islander; 3= Hispanic; 4= Other [e.g., Native American, multi-racial], and 5= White). The second set of independent variables involve adolescents' report of mental health problems, in particular, anxiety and depressive symptomalogy. Scores were

analyzed in their continuous and dichotomous forms, using the aforementioned cut-off scores for the latter.

Dependent. The main dependent variable in this study was adolescents' rate of substance use, in particular alcohol, cigarette, and marijuana.

Moderator. This study tested a moderator variable which is school involvement (i.e., school based extracurricular activities). School involvement could serve as a protective factor in the relation between substance use and mental health issues, namely depression and anxiety. This study sought to investigate if involvement in school-based extracurricular activities such as athletics, performing arts, and special interest clubs helped protect students who experience mental health problems from abusing substances. Scores of school involvement were analyzed in their continuous forms.

Overview of Analyses

A series of statistical analyses were conducted to answer the four research questions. Descriptive analyses were conducted for questions one and two, correlational analyses for question three, and predictive analyses for question four.

Question 1:

Among students attending a predominantly low-SES high school, what is the rate of adolescent substance use with respect to the following substances:

a. *Alcohol (e.g., liquor, beer, and wine)*
b. *Cigarettes*
c. *Marijuana?*

Descriptive analyses. Frequencies were obtained for all the substance use

variables of interest. For cigarette, alcohol use, an marijuana use, frequency distribution data were presented using the following items such as “In the past 12 months, on how many occasions have you smoked cigarettes”, “In the past 12 months, on how many occasions have you consumed liquor/beer/wine or wine coolers or malt beverages”, as well as “In the past 12 months, on how many occasions have you consumed marijuana”: 1 (zero occasions), 2 (one to two occasions), 3 (three to five occasions), 4 (six to nine occasions), 5 (10 to 19 occasions), 6 (20 to 39 occasions), and 7 (40 or more occasions).

Question 2:

Among students attending a predominantly low-SES high school, what is the percentage of students who have/are experiencing clinical levels of the following mental health problems:

a. Depression

b. Anxiety

i. General Anxiety Disorder

ii. Social Anxiety Disorder

iii. Significant school avoidance?

Descriptive analyses. Frequency distributions were produced for rates of anxiety and depressive symptomalogy among the sample. For depressive symptomalogy, frequency distribution data were presented in two forms: first, a distribution among each score within the complete range of scores, and second, a distribution when using the data dichotomized into two categories “at-risk” and “not at-risk” for a clinical diagnosis of depression (as defined by the aforementioned cut scores). Each question allowed the respondent to answer 0 *(less than 1 day)*, 1 *(1-2 days)*, 2 *(3-4 days)*, or 3 *(5-7 days)*. For

anxiety symptomalogy, frequency distribution data were also presented in two forms: first, a distribution among each score within the complete range of scores, and second, distribution when using dichotomized variables into two categories "at-risk" and "not at-risk" for a clinical diagnosis on Generalized Anxiety Disorder, Social Anxiety Disorder, and Significant School Avoidance (as defined by the aforementioned cut scores). Each question allowed participants to answer 0 (*not true or hardly ever true*), 1 (*somewhat true or sometimes true*), or 2 (*very true or often true*).

Question 3:

What are the relationships between substance use and mental health problems such as anxiety disorders and depression among high school students?

Correlational analyses. In order to determine the relationship (if any) between adolescents experiencing anxiety and depressive symptoms and their engagement in substance use (as defined as 3 variables: alcohol, cigarette, and marijuana) Pearson product moment correlations were calculated. Correlation analyses in the current study employed one dichotomous variable (i.e., substance use) and one continuous variable (i.e., symptoms of depression or anxiety disorder). When one variable is dichotomous and the other variable is continuous, a Pearson correlation is equivalent to a point biserial correlation. The coefficient can range from -1 to +1 with coefficients closer to -1 indicating a negative relationship between the two variables and coefficients closer to +1 indicating a positive relationship, and finally a coefficient equal to or close to 0 indicating no linear relationships between the two variables of interest.

Question 4:

Is school involvement a moderator in the relationship between mental health problems and substance use, such that high levels of school involvement protect students who experience mental health problems from abusing substances?

Correlational analyses. To first determine the presence of bivariate relationships between school-based extracurricular activity involvement and students' substance use, Pearson correlations were calculated between involvement in each of the four types of activities (i.e., students' mean scores on the items within a given cluster) and each of the three substance categories (with student data retained in its continuous form).

Logistic regression analyses. The dependent variables in the present study (alcohol use, cigarette use, and marijuana use) were eventually coded as categorical variables (used vs. not used), and therefore logistic regression analysis was used to test the relationships between substance use, mental health problems, and involvement in school-based extracurricular activities. For each outcome variable, the demographics variables of gender, grade, SES, and ethnicity were entered first and served as control variables. Then, one of the four mental health problems variables was entered (i.e., depression, generalized anxiety disorder, social anxiety disorder, and school avoidance) as well as one of the four potential moderator variables (i.e., prosocial/academically oriented activities, performing arts, special interests clubs, and athletics). The interaction of the two variables that were entered in the previous steps (e.g., depression and prosocial/academically oriented activities) was then added into the model. This process was repeated using each two-variable combination of mental health problems and involvement in school-based extracurricular activities. The analyses of interaction terms

were used to determine if there were significant interactions between different levels of the independent variables (e.g., depression*prosocial/ academically oriented activities).

Chapter Four

Results

Overview

This chapter begins with a discussion of the treatment of the data. Then, prevalence rates of substance use among students in 9th to 12th grade in a predominantly low SES high school are provided. Frequencies were obtained for all three variables of interest: alcohol (i.e., wine, beer, and liquor), cigarettes, and marijuana. Additionally, the frequency and percentage of students who were at risk for experiencing clinical levels of depression, generalized anxiety disorder, social anxiety disorder, as well as school avoidance, are provided. Frequency distributions are presented in two forms: distribution for each score within the complete range of scores and a distribution using the data in dichotomous form (at-risk vs. not at risk) based on clinical cut-point scores. Next, correlations between symptoms of anxiety and depression, student use of substances, and students' school-based extracurricular activity involvement are presented. Finally, results from logistic regression analyses conducted to examine the extent to which involvement in school-based extra-curricular activities is a moderator of the relationship between mental health problems and the engagement in substance use are presented.

Treatment of the Data

Graduate student members of the research team involved in the data collection for the larger study entered the data into SPSS and randomly checked approximately 15% of the entire dataset for accuracy. Approximately 99.9% of the data had been correctly

entered initially with the few mistakes being corrected immediately. Furthermore, the dataset was also reviewed for scores that fell outside the possible range of scores. This analysis was conducted by reviewing descriptive statistics for all variables of interest. CES-D data for 1 of the 139 participants could not be used because more than four items were incomplete. Thus, the final sample retained for all data analyses consisted of 138 participants.

Descriptive Analyses

Frequency distributions were calculated to determine specific rates of substance use in the sample within the past year. The frequency distribution for substance use was obtained for data retained both in continuous form and in dichotomized form (i.e., use or no use in the past twelve months). Based on the infrequent use of most of the substances that were included in the TADUS (e.g., ecstasy, cocaine, and heroin) as discussed by Snodgrass (2009), data were collapsed by combining substances into three clusters: alcohol (i.e., wine/wine coolers/malt beverages, beer, and liquor), cigarettes, and marijuana. The remaining 12 categories of substances were therefore not analyzed. The internal consistency reliability for the 3-item alcohol cluster was .77 in the current sample. The internal consistency reliability for marijuana and cigarettes was not calculated as both of these clusters included only one item. Table 2 displays the frequency of substance use (i.e., alcohol, cigarettes, and marijuana) with data presented in continuous form. Frequencies are provided for each of the seven different response choices that were provided to participants with choices ranging from 1 (zero occasions) to 7 (40 or more occasions).

Table 2
Frequency of Substance Use on a Continuum (n = 138)

Number of Times Used in the Last 12 Months	*Cigarettes*	*Marijuana*	*Alcohol*		
			Wine	*Beer*	*Liquor*
0	115	111	75	91	84
1-2	9	8	31	25	19
3-5	2	6	13	7	11
6-9	4	1	7	4	3
10-19	1	3	5	6	7
20-39	1	3	4	1	8
40 +	6	6	3	3	5
Missing Data	0	0	0	1	1
Total	138	138	138	138	138

The majority of participants reported engaging in substance use on zero occasions. It should be noted that 83.3% of the students in the sample reported not smoking a cigarette in the past year. Comparably, 80.4% of students in the sample reported not using marijuana in the past year. As for alcohol, the substance that was reported being used the least was beer, with 66% of participants reporting never having consumed a beer within the past 12 months. A wine/wine cooler was the alcoholic beverage most often consumed by the sample, with 46% of participants reporting having consumed wine and/or wine coolers within the past year. Notably, there was limited variability among frequency of use reported (e.g., reporting use of the substance 1 to 2 times or 6 to 9 times); most participants who reported any use in the past year indicated they used the substance only 1-2 times.

Due to the limited variability of responses, the frequency of substance use was

also dichotomized into two categories: use on zero occasions, and use on any occasion (1 or more) in the past year. This resulted in two categories of data indicating that the substance had been used within the past year, or had not been used within the past year. Table 3 displays frequency of substance use by category (i.e., alcohol, cigarettes, and marijuana) within the sample with the frequencies of substance use dichotomized into two response categories (yes and no).

Table 3
Frequency of Substance Use in its Dichotomous Form (n=138)

	Yes		No	
Substance Use Category	N	%	N	%
Alcohol	76	55.1	62	44.9
Cigarettes	23	16.7	115	83.3
Marijuana	27	19.6	111	80.4

Note. The dichotomous form was determined by categorizing all students who reported using substances at least once or more into one group (i.e., Yes) and all students indicating never using substances into a second group (i.e., No).

Alcohol was the most frequently used substance by participants, with 55.1% of the sample acknowledging having consumed some form of alcohol (Wine/Wine Coolers/Malt Beverages, Beer, and Liquor) at least 1 to 2 times within the previous year. As mentioned earlier, only 16.7% and 19.6% of the sample reported having consumed cigarettes or marijuana, respectively, at least 1 to 2 times within the previous year.

Frequency distributions were also constructed to determine specific rates of anxiety and depressive symptomalogy among the sample. The frequency distribution for depressive and anxiety symptomalogy was obtained with data presented both in continuous and dichotomized form. Table 4 displays the frequency distribution of depressive symptomalogy for each score within the complete range of scores.

Table 4

Frequency of Depressive Symptomalogy within Complete Range of Scores (n = 138)

Score	*n*	%
0	1	0.7
1	1	0.7
2	1	0.7
3	4	2.9
5	6	4.3
6	4	2.9
7	5	3.6
8	7	5.1
9	6	4.3
10	4	2.9
11	4	2.9
12	7	5.1
13	2	1.4
14	1	0.7
15	7	5.1
16	4	2.9
17	6	4.3
18	3	2.2
19	4	2.9
20	5	3.6
21	9	6.5
22	7	5.1
23	5	3.6
24	3	2.2
25	4	2.9
26	4	2.9
28	5	3.6
29	3	2.2
30	3	2.2
31	1	0.7
32	4	2.9
34	2	1.4
35	1	0.7
36	2	1.4
37	1	0.7
40	1	0.7
42	1	0.7

Note. Data obtained from the CES-D are presented on a continuum depicting the distribution among each score within the complete range of scores.

In this sample of adolescents, total depressive symptomalogy scores ranged from 0 to 42. Each of the 20 items on the CES-D asked participants to indicate on a 4-point scale with responses ranging from 0 (less than 1 day) to 3 (5-7 days), the frequency with which they experience such emotions, thoughts, and behaviors during the past week. Total scores could range from 0 to 60 with higher scores suggesting the presence of more frequent depressive symptoms and the endorsement of more symptoms associated with depression. Total depression scores were employed in analyses that examine the correlation between depressive symptomalogy and substance use. Regarding the distribution of the depression total score index, the mean score was 17.59 (*SD* = 9.36), median score was 17, and the mode 21. Frequencies of total scores were fairly evenly distributed with a relatively distinct peak (skew = 0.29, kurtosis = -0.62).

For anxiety symptomalogy, the frequency distribution was also analyzed by examining the composite scales in continuous forms. Table 5 displays the frequency distributions of total scores for the three anxiety subscales (i.e., generalized anxiety, social anxiety, and school avoidance).

Table 5

Frequency of Anxiety Symptomalogy Within the Complete Range of Scores (n = 138)

	Generalized Anxiety		Social Anxiety		School Avoidance	
Score	*n*	%	*n*	%	*n*	%
0	4	2.9	9	6.5	13	9.4
1	6	4.3	10	7.2	30	21.7
2	12	8.7	11	8.0	42	30.4
3	8	5.8	12	8.7	26	18.8
4	11	8.0	14	10.1	14	10.1
5	14	10.1	19	13.8	8	5.8
6	5	3.6	17	12.3	4	2.9
7	8	5.8	13	9.4	0	0.0
8	6	4.3	8	5.8	1	0.7
9	15	10.9	10	7.2		
10	14	10.1	2	1.4		
11	14	10.1	5	3.6		
12	7	5.1	5	3.6		
13	6	4.3	2	1.4		
14	2	1.4	1	0.7		
15	2	1.4				
16	2	1.4				
17	2	1.4				
Total	138	100	138	100	138	100

Note. Data obtained from the SCARED are presented on a continuum depicting the distribution among each score within the complete range of scores for each of the three factors (i.e., Generalized Anxiety Disorder, Social Anxiety Disorder, and Significant School Avoidance).

In the current sample of adolescents, total generalized anxiety symptomalogy scores ranged from 0 to 17. Each of the nine items on this subscale asked participants to indicate on a 3-point scale with responses ranging from 0 (not true or hardly ever true) to 2 (very true or often true), the degree to which they agreed with or experienced various emotions, thoughts, and behaviors in the last three months. Total scores could range from 0 to 18, with higher scores suggesting more frequent and severe symptoms of generalized anxiety. Frequencies of total scores were fairly evenly distributed, however, two peaks

were somewhat noticeable (skew = 0.10, kurtosis = -0.84). Specifically, most common total scores for generalized anxiety symptomalogy fell between 2 and 5, as well as 9 and 11, with a median score of 8, a mean of 7.37 (*SD* = 4.17), and a mode of 9. As for total social anxiety symptomalogy (7 items), scores ranged from 0 to 14. The most frequent total scores for social anxiety symptomalogy fell between 4 and 7 with a median score of 5, a mean of 5.37 (*SD* = 3.32), and a mode of 5. Frequencies of total scores were fairly evenly distributed, with the exception of a few relatively high scores (skew = 0.39, kurtosis = -0.37). Total school avoidance symptomalogy (4 items) scores ranged from 0 to 8. The majority of total school avoidance scores fell between 0 and 4, with a median score of 2, a mean of 2.32 (*SD* = 1.53), and a mode of 2. The distribution was somewhat positively skewed, with relatively few high scores (skew = 0.78, kurtosis = 0.76).

In order to examine what percentage of the sample was identified as at-risk of developing depression or an anxiety disorder, the data were also dichotomized ("at-risk vs. "not at-risk") based on cut-point scores suggested by the authors of both measures. Table 6 displays frequencies of participants "at-risk" or "not at-risk" for a clinical diagnosis of depression, generalized anxiety disorder, social anxiety disorder, and/or significant school avoidance.

Table 6
Frequency of Anxiety and Depressive Symptomalogy According to Cut-Point Scores (n = 138)

	Yes At-Risk Category		No Low-Risk Category	
	N	%	N	%
Depression	78	56.5	60	43.5
Generalized Anxiety	64	46.4	74	53.6
Social Anxiety	33	23.9	105	76.1
School Avoidance	53	38.4	85	61.6

Note. Data were categorized into two categories for all four mental health problems based on whether or not participants met the aforementioned cut-point scores to be considered "at-risk" for a clinical diagnosis

With regards to depression and generalized anxiety disorder, approximately half of the participants fell within the "at-risk" category for a clinical diagnosis with 56.5% and 46.4% of adolescents, respectively, falling in that category. Regarding school avoidance, 38.4% of the participants fell in the at-risk category. Finally, 23.9% of participants fell in the "at-risk" category for a clinical diagnosis of social anxiety disorder.

Correlational Analyses

To examine the relationships between anxiety or depressive symptoms and engagement in substance use (i.e., alcohol, cigarettes, and marijuana), Pearson correlation coefficients were calculated. Independent variables (i.e., depression, generalized anxiety, social anxiety, and school avoidance) were treated as continuous variables, whereas for the dependent variables (i.e., alcohol, cigarettes, and marijuana use) data were dichotomized ("used" versus "not used") for the reasons previously explained. Correlation coefficients are presented in Table 7.

Table 7
Correlation between Mental Health Symptomalogy and Substance Use (n = 138)

	Alcohol	Cigarettes	Marijuana
1. Depression	.11	.14	.11
2. Generalized Anxiety	.02	.00	.04
3. Social Anxiety	-.13	-.06	-.12
4. School Avoidance	.06	.17*	.17*

Note. For all three substances analyses were conducted using data dichotomized into two categories (use or no use) due to the limited variability in student responses. However, data were kept in its continuous form for all four mental health problems.

*$p < .05$

Only a few correlations were statistically significant. As predicted, school avoidance was positively correlated with use of cigarettes ($r = .17$, $p < .05$) and marijuana ($r = .17$, $p < .05$). This indicates that higher scores on the school avoidance measure correlate with use of cigarettes and marijuana. Symptoms of depression, generalized anxiety, and social anxiety were not related to alcohol consumption, cigarette use, or marijuana use.

To determine the relationship between school-based extracurricular activities and self-reported use of alcohol, cigarettes, and marijuana, Pearson correlation coefficients were calculated. Again, the dichotomized form of the dependent variable, substance use, was used for correlation analyses. Measures of engagement in school-based extracurricular activities were treated as continuous variables. Correlation coefficients are presented in Table 8.

Table 8
Correlation between Participation in School-Based Extracurricular Activities and Substance Use (n = 138)

	Alcohol	Cigarettes	Marijuana
1. Prosocial/Academic Clubs	-.08	-.24**	-.15
2. Special Interests Clubs	.07	-.19*	-.06
3. Performing Arts Clubs	.06	-.01	.01
4. Athletics Clubs	.06	-.09	-.16

Note. Substance use data dichotomized into two categories (use or no use) were used for the analyses and categories of school-based extracurricular involvement were scaled using data into continuous form.

*p<.05. **p<.01.

All significant correlations occurred in the expected directions. Specifically, cigarette use had a significant, inverse relationship with involvement in prosocial/ academic clubs (r = -.24, p <.01). This indicates that the more adolescents are involved in prosocial/academically oriented school-based extracurricular activities, the less likely they are to report smoking cigarettes. Cigarette use was also significantly negatively correlated with involvement in special interest clubs (r = -.19, p <.05). This also indicates that the more adolescents are involved in special interest clubs at school, the less likely they are to smoke cigarettes. It should be noted that none of the four school-based extracurricular activity clusters was significantly related to adolescents' alcohol or marijuana use. However, it should be highlighted that there was a trend toward a significant result with regards to the correlation between marijuana use and involvement in athletics (r = -.16, p = .07).

Predictive Analyses

To examine the relationships between the TADUS (i.e., alcohol, cigarettes, and marijuana), PSRAQ (i.e., Prosocial/Academic, special interests, performing arts, and athletics), CES-D total score, and the total score for three of the subscales on the

SCARED (i.e., generalized anxiety disorder, social anxiety disorder, and school avoidance), Pearson correlation coefficients were calculated. Intercorrelations are presented in Table 9.

Table 9

Intercorrelations between Substance Clusters on TADUS, School Involvement Clusters, SCARED, and CES-D scores

Item	1	2	3	4	5	6	7	8	9	10	11
1. Alcohol Use	1										
2. Cigarette Use	.37**	1									
3. Marijuana Use	.41**	.56**	1								
4. Depression	.11	.14	.11	1							
5. Generalized Anxiety	.02	.00	.04	.56**	1						
6. Social Anxiety	-.13	-.06	-.12	.42**	.52**	1					
7. School Avoidance	.06	.17*	.17*	.48**	.41**	.33**	1				
8. Prosocial/Academic Clubs	-.08	.24**	-.15	-.14	.02	-.01	-.12	1			
9. Special Interest Clubs	.07	-.19*	-.06	-.15	-.09	-.14	-.09	.41**	1		
10. Performing Arts Clubs	.06	-.01	.01	-.01	.09	-.05	-.17*	.26**	.21*	1	
11. Athletics	-.06	-.09	-.16	-.14	-.08	-.21*	-.18*	.28**	.38**	.15	1

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

Independent variables were assessed for multicollinearity, prior to conducting the logistic regression analyses. Multicollinearity occurs when strong correlations exist between independent variables. When the independent variables are significantly alike, it becomes difficult to determine which of the independent variables is producing the effect on the dependent variable. The existence of multicollinearity is undesirable, as it can lead to inaccurate regression coefficients and can therefore result in erroneous conclusions regarding the relationships between the independent and dependent variables (Ying, Peng, Lee, & Ingersoll, 2002). Correlations between independent variables ranged from -. 21 to .56, and were in general not strong enough to indicate the presence of multicollinearity according to guidelines set forth by Myers (1990). Within the anxiety subscales, correlations ranged from .33 to .52, which also fail to indicate multicollinearity. These subscales appear to measure distinct constructs and such results confirm the need to analyze each of the three anxiety subscales separately. Regarding types of extracurricular activities, correlations between the four clusters (determined using factor analysis) ranged from .15 to .41. These correlations also confirm the need to analyze each of these school-based extracurricular activities clusters separately. The highest correlation between two independent variables was the correlation between depressive symptomalogy and generalized anxiety disorder with a coefficient of .56.

To test the relationships between substance use (i.e., alcohol, cigarettes, and marijuana), each of the four mental health problems, and involvement in school-based extracurricular activities, data were subjected to a series of logistic regression analyses. For each outcome variable, the demographics variables of gender, grade, SES, and ethnicity were entered first and served as control variables. Then, one of the four mental

health problems variables was entered (i.e., depression, generalized anxiety disorder, social anxiety disorder, and school avoidance) as well as one of the four potential moderator variables (i.e., prosocial/academically oriented activities, performing arts, special interests clubs, and athletics). The interaction of the two variables that were entered in the previous steps (e.g., depression and prosocial/academically oriented activities) was then added into the model. This process was repeated using each two-variable combination of mental health problems and involvement in school-based extracurricular activities. Logistic regression analyses were conducted for each of the three substances (i.e., alcohol, cigarettes, and marijuana) to determine which of the two-variable combinations of mental health problems and involvement in school-based extracurricular activities, if any, are most predictive of whether or not high school students use substances. The results pertinent to the interaction terms are presented in detail in Table 10 (criterion: alcohol use), Table 11 (criterion: cigarette use), and Table 12 (criterion: marijuana use). Notably, significant differences obtained in the logistic regression analyses should be interpreted with caution given the large number of comparisons that were made, which increases the possibility of making a Type I error.

For the dependent variable alcohol use, when all seven covariates, main effects, and each two-variable combinations (e.g., depression*prosocial/ academically oriented activities, school avoidance*athletic activities, generalized anxiety*performing arts, social anxiety*special interest clubs, etc.) were considered together in separate models, none of the sixteen interaction terms was statistically significantly ($p > .05$). The results indicated that students with varying levels of anxiety disorders and depression were similarly likely to use alcohol regardless of the extent of their participation in any of the

four types of extracurricular activities. It should also be noted that when each independent variable was considered independently, none of the focal independent variables or potential moderators significantly predicted alcohol use. Thus, alcohol was unrelated to either students' levels of mental health problems or simple involvement in extracurricular activities. These findings are consistent with the null results yielded in the bivariate correlational analyses that suggested no relationships between students' alcohol use and either mental health or involvement in extracurricular activities. Tables 13 through 16 contain the results of the main effects of the logistic regressions for all the independent variables in predicting alcohol use.

For the dependent variable of cigarette use, when all covariates, main effects, and two-variable combinations were considered together in separate models, one of the sixteen interaction terms was statistically significant ($p < .05$). This interaction involved social anxiety x athletics ($X^2 = 3.99$, $df = 1$, $p < .05$). Follow-up examinations of odds ratios predicting cigarette use under different conditions (low vs. high) of athletic activity involvement and social anxiety indicated that high athletic activity involvement served to buffer students with high social anxiety from using cigarettes. Specifically, students with high athletic activity were less likely to smoke cigarettes regardless if their level of social anxiety was low (odds ratio = -.12) or high (odds ratio = -.52). On the other hand, for students with low levels of involvement in athletic involvement, the likelihood of using cigarettes was quite high for students with low levels of social anxiety (odds ratio = 3.51) and also elevated, albeit to a less extent, for students with high social anxiety (odds ratio = 1.41) In sum, athletic involvement served as a protective factor for students with social anxiety, as students with high levels of social anxiety were less likely to use

cigarettes only in the event that they reported high participation in athletic extracurricular activities.

In addition to the significant interaction term, there were several significant main effects for cigarette use. Tables 17 through 20 contain the results of the main effects of the logistic regressions for all the independent variables in predicting cigarette use. As can be seen in Table 17, involvement in prosocial/academic clubs had a statistically significant effect on cigarette use in each of the models in which it was paired with one of the four mental health problems (i.e., depression, generalized anxiety, social anxiety, and school avoidance). In each of these four cases, involvement in prosocial/academic clubs decreased the odds of using cigarettes, a main effect consistent with the aforementioned inverse bivariate correlation between prosocial/academic clubs and cigarette use. In all four models, students who indicated higher levels of involvement were less likely than other participants to report the use of cigarettes. Specifically, in the model containing all covariates, depression, and involvement in prosocial/academically oriented activities, students who indicated higher levels of involvement were less likely (odds ratio = .75) than other participants to report the use of cigarettes ($X^2 = 6.54$, $df = 1$, $N = 137$, $p < .05$). In the model containing generalized anxiety, students who indicated higher levels of involvement in prosocial/academically oriented activities were less likely (odds ratio = .75) than other participants to report the use of cigarettes ($X^2 = 6.86$, $df = 1$, $N = 137$, $p < .05$). In the model containing social anxiety, students who indicated higher levels of involvement were also less likely (odds ratio = .75) than other participants to report the use of cigarettes ($X^2 = 6.81$, $df = 1$, $N = 137$, $p < .05$). Lastly, in the model containing school avoidance, students who indicated higher levels of involvement were less likely

(odds ratio = .75) than other participants to report the use of cigarettes (X^2 = 6.53, *df* = 1, *N* = 137, *p* < .05).

As can be seen in Table 18, involvement in special interests clubs also had a statistically significant effect on cigarette use in each of the models in which it was paired with one of the four mental health problems (i.e., depression, generalized anxiety, social anxiety, and school avoidance). In each of these four cases, involvement in special interest clubs decreased the odds of using cigarettes, a main effect consistent with the aforementioned inverse bivariate correlation between involvement in special interest clubs and cigarette use. In the model containing all covariates, depression, and involvement in special interest clubs, students who indicated higher levels of involvement were less likely (odds ratio = .83) than other participants to report the use of cigarettes (X^2 = 3.99, *df* = 1, *N* = 137, *p* < .05). In the model containing generalized anxiety, students who indicated higher levels of involvement in special interest clubs were less likely (odds ratio = .83) than other participants to report the use of cigarettes (X^2 = 4.54, *df* = 1, *N* = 137, *p* < .05). In the model containing social anxiety, students who indicated higher levels of involvement were also less likely (odds ratio = .82) than other participants to report the use of cigarettes (X^2 = 4.80, *df* = 1, *N* = 137, *p* < .05). Lastly, in the model containing school avoidance, students who indicated higher levels of involvement were less likely (odds ratio = .82) than other participants to report the use of cigarettes (X^2 = 4.33, *df* = 1, *N* = 137, *p* < .05).

For the criterion variable marijuana use, when all predictor variables were considered together in a model, none of the sixteen interaction s were statistically significant. The results indicated that the predictors, as a set, did not reliably distinguish

between participants who reported using marijuana and those who did not. However, one of the independent variables significantly predicted whether or not participants reported using marijuana, indicating a main effect of involvement in a particular type of school-based extracurricular activity on student marijuana use. Tables 21 through 24 contain the results of the main effects of the logistic regressions for all the independent variables in predicting marijuana use. As can be seen in Table 24, involvement in athletics was statistically significant in the prediction model containing all seven covariates, social anxiety, and athletics ($X^2 = 4.83$, $df = 1$, $N = 133$, $p < .05$). Specifically, students who indicated high levels of involvement in athletics were less likely (odds ratio = .72) to report the use of marijuana than other participants. This finding is consistent with the bivariate correlational analyses obtained earlier in this paper, that suggested a trend ($p = .07$) for an inverse relationship between athletics involvement and marijuana use, even though that correlation was not significant at the .05 level.

Chapter Five

Discussion

Study Summary

The current study examined the rates of substance use among ninth to twelfth grade students in a predominantly Hispanic and low SES high school located in Florida. This study also examined the percentage of adolescents in this population who are experiencing anxiety and depressive symptomalogy. Furthermore, this study determined the relationship(s) between several substances used, anxiety, and depressive symptomalogy. The current study also contributed to current literature by determining the types of school-based extracurricular activities that co-occur with use of specific substances. Finally, this study looked at the unique interactions between each of the four mental health problems discussed and each of the four categories of school-based activities and determined if any of these interactions significantly predicted the extracurricular activity conditions under which high school students with varying levels of mental health problems are more or less likely to use alcohol, cigarettes, and marijuana.

In this chapter, the results of the current study are summarized and notable findings are highlighted Similarities and differences between findings in the literature and findings in the current study are discussed. Furthermore, the implications of the results for school psychologists and other mental health professionals as well as the importance of addressing issues pertinent to substance use, mental health, and student involvement in

extra-curricular activities, are addressed. Lastly, this chapter identifies the limitations of the current study, and offers directions for future research.

Findings Regarding Frequency of Substance Use among High School Students

The majority of participants in the current study reported not using drugs, in the past year. Several substances (e.g., crack, cocaine, heroin) listed in the TADUS were virtually never endorsed by participants. In contrast, the three most commonly used substances by youth within the last year were alcohol, cigarettes, and marijuana. This finding is consistent with the results from the MFS study in which these three substances were also identified as the main substances used by adolescents (Johnston et al., 2007).

It should be noted that alcohol was the most used substance among this sample of 9^{th} to 12^{th} grade students, with over half of the participants (55.1%) reporting having consumed wine/wine cooler, beer, and/or liquor in the past twelve months. The most used type of alcohol was wine/wine coolers, with almost half of the sample (45.7%) having consumed it. In this sample, very few of the students who reported drinking in the past year did not consume wine/wine coolers and instead consumed beer and/or liquor. Marijuana and cigarettes were not as frequently being used in the past year, with only 19.6% and 16.7% of the students in the sample reporting having used these substances at least once. Previous research examining rates of substance use among adolescents also noted that alcohol remains the most commonly used substance and is considerably widespread among current adolescents. The prevalence rate of alcohol use in the current study is comparable to the annual prevalence rate of alcohol use (56.3%) among 10^{th} grade students in the MFS national survey of adolescent substance use (Johnston et al., 2007). In that study, almost three quarters of students had consumed alcohol before the

end of twelfth grade. Numbers obtained in the current study provide a snapshot of use in a one-year period rather than during the entire high school experience.

Regarding cigarettes, the rate of cigarette use in the current study was somewhat lower than the prevalence of students who reported smoking cigarettes in the MFS study by twelfth grade (specifically, 46%). Even though the rates of cigarette use in the current study and in the MFS study are not directly comparable because the questions asked in both surveys were not the same, it should be noted that one quarter of eight grade students reported having tried cigarettes (Johnston et al., 2007). The use rate in the current study may be lower than the rate of cigarette use in national studies due to the specific profile of students in the current study. Specifically, 60% of participants in this study were Hispanic. The literature on trends in substance use tends to show that Hispanic students have lower rates of cigarette use as compared to Caucasian students (Johnston et al., 2007; NSDUH, 2008). Another reason for the disparate rates may pertain to features of the current study's design. Specifically, active parental consent as well as child assent was also required for participation. The use of only students with active parental consent might have resulted in the participation of a subgroup of high school students that are very different from high school students nationwide and even in that particular school (as suggested by the low participation rate of 10.3%). Thus, the current sample might not optimally represent the larger high school student population.

Another commonly endorsed substance in the current sample was marijuana, with 19.6% of the participants reporting having used marijuana within the past year. This rate is pretty comparable to the rate of marijuana use (15.5%) reported by eight and tenth grade students within the past year in the national study conducted by Johnston et al.

(2007). In the MFS, 22.6% of 8th and 10th grade students reported using marijuana at some point during their lifetime. Similarly, the Youth Risk Behavior Survey (YRBS), which is another source of data that provides annual trends in the use of substances among students in 9th through 12th grade, reported that 19.7% of youth used marijuana in 2007. Also noteworthy, the majority of people who used illicit substances for the first time within the past 12 months reported using marijuana as their first drug (Johnston et al., 2007). Marijuana has been described as a gateway drug in numerous studies and current numbers demonstrate that many high school students use marijuana. Furthermore, approximately half of the youth aged 12 to 17years in the sample from the MFS reported that it would be "fairly easy" or "very easy" to obtain marijuana if they wanted to consume some (Johnston et al., 2007).

Findings Regarding Depressive Symptomalogy among High School Students

As reported in previous research that examined the prevalence of mental health problems among youth, depression and anxiety are two of the most common psychological problems that children and adolescents experience (Huberty, 2008). Recent estimates suggest that as many as 15-20% of children and youth have depressive or anxiety problems that warrant direct intervention (Huberty, 2008). In the current study a total of 78 participants, which represents 56.5% of the sample, were considered at risk for depression. However, this number should be interpreted with caution, as the CES-D has been used in numerous studies and found to over-identify the number of individuals who are at risk for depression due to its low cutoff score of 16 (Doerfler, Felner, Rowlison, Raley, & Evans, 1988; Roberts, Lewinsohn, & Seeley, 1991; Rushton et al., 2002). In fact, Roberts et al. (1991) recommend using a cutoff score of 24 for the CES-D when

screening for adolescent depression. While taking into consideration the over-identification of adolescents at risk for depression, it is still important to note that even if diagnostic criteria for depression are not met, sub-syndromal depressive symptoms are capable of significantly impacting an adolescent's life (Hammen & Rudolph, 2003). According to Costello et al. (2005), the prevalence of depressive symptomalogy and depression in youth between the ages of 5 to 17 years ranges between 1% and 18%. In a study that collected data using the CES-D from 13, 568 adolescents in grades seven through twelve, the authors found that approximately 30% of the sample reported depressive symptomalogy, when a cut point score of 24 was used (Rushton et al., 2002). This prevalence rate, even though not as high as the one obtained in the current study due to the use of different cut-point scores, emphasizes the need to address and prevent depression, as it is very common during adolescence and has been shown to negatively affect many aspects of one's life. Specifically, numerous studies have identified short and long-term adverse impacts of depression on school functioning, family and peer relationships, and substance use (Bhatia et al., 2007; Evans et al., 2002).

Findings Regarding Anxiety Symptomalogy among High School Students

Within the category of anxiety disorders, the percent of participants who were considered "at-risk" for a clinical disorder of generalized anxiety, social anxiety, and school avoidance were examined. Total scores looking at the continuum of scores were also taken into consideration to look more closely at the severity of sub-syndromal symptoms. Approximately half of the participants in the current study fell within the "at-risk" category for a clinical diagnosis of one of the three anxiety disorders examined. Previous studies examining rates of any anxiety disorders in youth have estimated that

the prevalence rate falls between 10 and 20% (Albano, Chorpita, & Barlow, 2003; Costello & Angold, 1995). This number is significant considering that these youth meet full criteria for a clinical disorder. The high proportion of students in the current study who fell in the "at-risk" category for an anxiety disorder underscores that there is a need to address anxiety in adolescents.

Youth who experience numerous or significant symptoms of generalized anxiety disorder are often overly-focused on school performance and sport activities even when they or their performance is not being evaluated by others (DSM-IV-TR, APA, 2000). Such preoccupation, even if not sufficiently elevated to meet criteria for a diagnosis, might still negatively impact their schooling as well as functioning in other important areas of life. In the current sample, 46.4% of students with a mean score of 7.37 (*SD* = 4.17), fell in the "at-risk" category for generalized anxiety. When compared to a study conducted in China by Linyan, Kai, Fang, and Xueping (2007), students' mean score on the SCARED generalized anxiety subscale in the current sample was higher than the mean score of adolescent students between the ages of 13 and 16 years (*M* =4.33, *SD* = 3.49). A lower mean was also observed in a sample of African-American high school students (*M* = 5.70, *SD* = 3.97) from an economically disadvantaged community (Boyd et al., 2003). However, the mean score in the current sample was lower than the mean score of a sample of students between the ages of fourteen to eighteen (*M* = 12.77, *SD* = 3.68) in the Netherlands (Hale, Raaijmakers, Muris, & Meeus, 2005). These differences in mean scores might be due to differences in culture, values, circumstances and way of life; these hypotheses that were also discussed by Crocetti, Hale, Fermani, Raaijmakers, and Meeus (2009).

With regards to social anxiety disorder, the percent of students in the current study who fell in the "at-risk" category (23.9%) was not as high as for depression and generalized anxiety disorder. Approximately one fourth of participants fell within the "at-risk" range for a clinical disorder of social anxiety disorder. The high rate of social anxiety is consistent with previous studies that indicated that social anxiety disorder is one of the most prevalent anxiety disorders during adolescence (Costello et al., 2005; Kessler, Berglund, Demler, Jin, Merikangas, & Walters, 2005; National Mental Health Information Center, 2003). National prevalence rates of social anxiety vary greatly with a lifetime prevalence ranging from 1% to 12% in youth ages 5 to 17 years (Costello et al., 2005; DSM-IV-TR, APA, 2000). It should also be noted that the median age of onset identified for social anxiety is at the age of 13, which is the approximate age when young adolescents are finishing middle school and entering high school (Kessler et al., 2005). Kessler and colleagues found that the prevalence rate of social anxiety was highest during adolescence and early adulthood. When compared to other studies examining the mean score of adolescent students on the SCARED social anxiety subscale, the mean score of 5.37 (*SD* = 3.32) of students in the current sample was comparable to the mean score of 5.56 (*SD* = 3.44) obtained in a sample of African-American students attending a low-SES high school (Boyd et al., 2003) and somewhat higher than the mean obtained in a sample of Chinese adolescent students (mean score 4.10, *SD* = 3.22; Linyan et al., 2007). Prevalence rates of students exceeding the cut point for the at-risk range could not be compared, as they were not discussed in previous published studies. These similarities and differences in mean scores might again be due to similarities or differences in culture, values, and circumstances. It should be noted that more similarities were found

between the current sample and the sample of African-American high school students in a economically disadvantaged community.

Although not formally classified as an anxiety disorder, school avoidance has been discussed in the literature as a manifestation of symptom of various mental health disorders, particularly, anxiety disorders (Kearney & Albano, 2004; Kearny, 2008). The percentage of participants who fell in the "at-risk" range for significant school avoidance (38.4 %) was fairly high, possibly because the cut-point score identified as being "at-risk" appears to be fairly low (i.e., raw score of 3 among scores that can range from 0 to 8). The avoidance of school-related stimuli that provoke general anxiety and depression as well as the escape from aversive social and evaluative situations in the school environment have been found to be related to GAD, social anxiety, and depression (Kearney & Albano, 2004). Because generalized anxiety disorder and depressive symptomalogy were rather prevalent in the current study, this may also explain why the percentage of students considered "at-risk" for significant school avoidance might also be fairly high. When compared to others studies examining the mean score of adolescent students on the SCARED school avoidance subscale, the mean score of students in the current sample (M = 2.32, SD = 1.53) was again comparable to the mean score of students in the African-American sample (M = 1.90, SD = .79), but higher than the mean score of adolescent students in the Chinese sample (M = 0.98, SD = 1.34; Boyd et al., 2003; Linyan et al., 2007). However, current mean scores on the school avoidance subscale were much lower than the mean score of 6.14 (SD = 2.15) in the sample of adolescent students in the Netherlands (Hale et al., 2005). A discussion of differences

between percentages of students who fell in the "at-risk" category for significant school avoidance is not possible, as specific rates were not discussed in previous studies.

Notable Findings Regarding Interrelationships between Variables

The current study identified a few significant relationships between mental health problems and substance use, specifically with regards to school avoidance and the use of cigarettes and marijuana. In particular, symptoms and behaviors associated with school avoidance co-occurred with cigarette and marijuana use. Even though previous research has demonstrated that adolescent substance use often co-occurs with mental health problems, particularly depression and either GAD, social anxiety, or anxious personality traits (Armstrong et al., 2002; Chang et al., 2005; Comeau et al., 2001; Kaplow et al., 2001; Poulin et al., 2005), studies have not specifically looked at the relationship between significant school avoidance/ school refusal and substance use. In the current study, substance use was inversely correlated with school avoidance but not with social anxiety, generalized anxiety, or depressive symptomalogy. The links found between cigarette and marijuana use and students refusing to attend school might be related to untreated mental health symptoms (e.g., generalized anxiety, depression) but also associated with other variables not discussed or analyzed in the current study (e.g., externalizing disorders). This last hypothesis is in line with the notion that adolescent students sometimes refuse to go to school in order to engage in more appealing activities such as substance use. Kearney (2008) explained that there are several functions or reasons why children and adolescents might refuse to attend school and according to his research, such a function is most often linked to externalizing disorders (e.g., oppositional defiant disorder).

Contrary to some findings (Chang et al., 2005; Chassin et al., 1999; Diego et al.,

2003; King et al., 2004, Valentiner et al.,Vogel et al., 2003), no significant relationship was found between any of the three substances and depression, generalized anxiety, or social anxiety. It should be noted, however, that it has been explained in the literature that the links between substance use and internalizing disorders are less clear (King et al., 2004). Numerous studies have identified clear links between substance use and externalizing disorders, and a positive relationship between substance use and internalizing problems has been found to be more significant in females than in male adolescents (Chassin et al., 1999; Chang et al., 2003; Diego et al., 2003; King et al., 2004; Rhode et al., 1996). One of the hypotheses for the gender difference involves the higher prevalence rate of internalizing disorders among females (Brady & Randall, 1999). However, some of the reasons why similar findings might not have been obtained in the current study which consisted of a predominantly female sample could be due to unique features of the current sample in relation to samples used in previous studies. The small sample size in this study as well as the large number of Hispanic students might have contributed to current findings. One hypothesis is that the females in this sample, which was largely Hispanic, might have a different way of dealing with the symptoms associated with internalizing mental health disorders, such as seeking options (e.g., family support) other than using substances.

With regards to the relationship between school-based extracurricular activities and self-reported substance use, a couple of significant correlations were found. Specifically, a moderate, negative relationship was indicated between cigarette smoking and involvement in prosocial/academic activities (i.e., community service, student government, language, and academic clubs), as well as special interests clubs (i.e., school

publications, business/career, social clubs, and hobby clubs). Previous research has demonstrated that adolescents who are involved in school-based extracurricular activities, that are characterized by structure and supervision while at the same time allowing youth to socialize and express their identity, are less likely to use substances (Bohnert et al., 2007; Darling, 2005; Eccles et al., 1999; Fredricks et al., 2006; Peck et al., 2008). Darling (2005) examined involvement in school-based extracurricular and found that students who were involved in school-based extracurricular activities were less likely to use substances other than alcohol (e.g., tobacco, marijuana, other illegal drugs). These findings are similar to the ones from the current study, in which a significant negative relationship was noted between use of cigarettes and marijuana, and involvement in certain structured and supervised school-based extracurricular activities. Furthermore, Bohnert and Garber (2007) also found that involvement in organized activities during high school was associated with lower levels of tobacco use. However, no relationships were found between alcohol use and involvement in school-based extracurricular activities. In general, involvement in prosocial/academic activities was the strongest correlate of lower substance use. Also important to note, in Darling's study, Caucasian students were the most likely to engage in school-based extracurricular activities while Hispanic-American students were the least likely to participate in such activities (2005). The majority of participants in the current study identified themselves as Hispanic. Thus, the current study extends the literature by showing that the positive relationship between involvement in school-based extracurricular activities and reduced cigarette use also applies to samples of youth that include minority ethnic and racial groups.

No significant bivariate correlations were found between use of marijuana or

alcohol and any of the extracurricular school-based activities. Even though there was no statistically significant correlations between marijuana and involvement in prosocial/academic clubs or athletics clubs, the relationships occurred in the expected direction (and the inverse relationship between athletic involvement and marijuana use emerged as a significant main effect in logistic regressions conducted to test for interactions between specific variables), suggesting that the more adolescents are involved in both these activities, the less likely they may be to use marijuana. Such preliminary results augment the literature, as the relationship between involvement in school-based extracurricular activities and substance use has not been extensively studied. Specifically, previous studies did not examine specific types of extracurricular activities. In the study by Bohnert and colleague (2007), although the authors identified seven distinct categories of activities (i.e., sports, performance/fine arts, prosocial, and academic clubs, school involvement, press, and leadership), the authors analyzed the mean number of activities in which adolescents were involved in each year, thus using an overall index of activity involvement. Less emphasis was placed on identifying involvement in specific school-based activities that are associated with lower substance use, but a significant negative relationship was found between involvement in three of the categories of activities (i.e., sports, performance arts, and prosocial clubs) and tobacco use. The authors did not analyze alcohol or marijuana use in their study. Furthermore, Darling (2005) in her study failed to find a significant relationship between adolescents who participated in extracurricular activities and alcohol use. The author noted a significant negative correlation between involvement in extracurricular activities and cigarette as well as marijuana use. However, the relationship between specific school-

based extracurricular activities and substance was not analyzed in depth. The lack of detailed information regarding the variety of experiences adolescents have across different extracurricular activities was noted as the primary limitation of that study. Darling noted that information regarding various activities would provide a more detailed portrait and a better understanding of the type of activities that are most likely to facilitate positive development and better adolescent adjustment. The current study fills such a gap in the literature and suggests that prosocial/academic and special interest clubs may be particularly adaptive with regard to prevention of cigarette use, and athletics involvement may help in reducing the risk for marijuana use. Further study with larger sample sizes that would increase power to detect even small (but clinically significant) relationships are needed to test these preliminary conclusions.

The current study was the first to examine involvement in school-based extracurricular activities as a moderator in the relationship between internalizing mental health problems and substance use among high school students. Thus, findings from this line of inquiry cannot be fully compared to findings in prior research. However, it should be noted that Darling (2005) and Bohnert and Garber (2007) looked at the bivariate relationship between involvement in extracurricular activities in high school and internalizing problems (e.g., mood and anxiety disorders), and both studies concluded that the relation between both variables was marginal. Both studies noted a nonsignificant trend for higher involvement in extracurricular activities to be associated with lower levels of depression as well as mood and anxiety disorders in general. The current study suggests that a link between internalizing forms of psychopathology and extracurricular activity involvement likely ranges from non-existent (for instance, in the case of

depression and generalized anxiety) to weak and inverse (specifically, in the case of school avoidance and social anxiety when examined in relation to involvement in athletics and performing arts clubs). However, preliminary findings in the current study suggest that high levels of athletic involvement serve as a protective factor against cigarette use for those students with a specific form of anxiety- social anxiety. Among students with high social anxiety who were not engaged in athletic activities, the likelihood of cigarette use was elevated. In sum, these findings suggest that athletics may serve as a moderator in the relationship between social anxiety and cigarette use.

Implications for School Psychologists and other Mental Health Professionals

As previously stated, alcohol was the most used substance among this sample of 9th to 12th grade students, with over half of the participants (55.1%) reporting having consumed wine/wine cooler, beer, and/or liquor in the past twelve months. The rate of cigarette use in the current study was somewhat lower than the prevalence of 12th grade students who reported smoking cigarettes in the MFS (specifically, 46%). However, the prevalence rate still warrants attention as 16.7% of participants reported smoking cigarettes within the past year. Another commonly endorsed substance in the current sample was marijuana, with 19.6% of the participants reporting having used marijuana within the past year.

Substance use during adolescence is associated with numerous undesirable as well as negative consequences, including decreased academic functioning and lower educational attainment (Diego et al., 2003; Engberg et al., 2006; King et al., 2006), diminished socio-emotional functioning (The National Survey on Drug Use and Health, 2008; Johnston et al., 2007), and later dependency on substances and the development of

substance use disorders (Dewit, Adlaf, & Offord, 2000; Diego et al., 2003; Johnston et al., 2007). With regards to the negative impact of substance abuse on education, substance abuse in youth is commonly followed by lower expectations, poor performance in school, a drop in grades, higher rates of truancy, higher rates of drop out, as well as lowered aspirations to pursue a higher education (Dewey, 1999; Ellickson, McGuigan, Adams, Bell, & Hays, 1996; Hays & Ellickson, 1996). The current study extends this list of negative educational outcome to include school avoidance. Such relationships confirm the need for school psychologists and other mental health professionals to help prevent the use of substances in high school and thus the many consequences associated with it.

Several groups, organizations and government funded programs have developed prevention education programs on substance use and abuse for youth as young as elementary school. One such drug prevention program and non-profit public benefit organization, Narconon, recruited fourteen schools from two states (Oklahoma and Hawaii) to conduct a study on the effectiveness of its drug education curriculum program for high students (Lennox & Cecchini, 2008). Schools were assigned to a control group or another group in which the program was delivered. Baseline data, as well as data at a one-month and six-month follow up were collected and pretest levels of substance use were controlled for between the two groups. The Narconon drug education curriculum includes eight sessions that each address specific topics such as "Drugs and the Body," "Alcohol, Drugs, and the Media," and "Goals and the Emotional Scale." Included in this curriculum are interactive activities, a family and community component, take-home assignments, and social influence skills. At the six-month follow-up, students who participated in the program were less likely to use substances, more likely to perceive

risks associated with substance use, had more positive attitudes and stronger commitment to a drug free lifestyle than students in the control group. This program was shown to empower youth to make their own decisions and draw their own conclusions, correct common but false message regarding substance use and its effects, improve interpersonal skills which, the authors explain, may result in a shift in the perception of risks as well as attitudes about substance use (Lennox & Cecchini, 2008). Programs such as this one help change adolescents' perceptions, attitudes, and behaviors towards substances. Such efforts are important as various organizations and government agencies find a need to develop effective substance use prevention programs in schools.

Even though the links between substance use and symptoms of mental health problems were small in the current study, the high prevalence rates of depression and some anxiety disorders demonstrate a need to screen adolescents for internalizing mental health disorders. Even though such problems are very common in school-age students, they often remain under the radar. Such youth who need help often fail to receive the necessary help due to a lack of systematic procedures to identify those at risk of developing internalizing disorders (e.g., depression, anxiety). In the current system, even with the new approach to problem-solving and using a response to intervention model, mental health problems are not as easily identifiable as academic and externalizing behavior problems. There currently considerable emphasis on prevention and early intervention with regards to students' academic and behavior progress; however, socio-emotional aspects of students' lives are relatively ignored. By catching and addressing early signs of depressive and anxiety symptomalogy, mental health professionals and other school employees have the potential to prevent more serious problems, as well as

have more chances of having a positive impact on students' academic achievement and behavior. The results from this study can assist in informing school psychologists about specific school-based extracurricular activities that may protect students from developing maladaptive behaviors such as substance abuse or school avoidance. At a school-wide level or Tier I level, prevention efforts and interventions that target the advantages and importance of structured and constructive activities that are supervised but yet allow students to express their individuality and uniqueness as well as provide them with opportunities to develop talents and pursue interests, might deter certain students from engaging in substance use. Involvement in such activities might also provide students with a safe place where they can blossom and express themselves in a constructive way, while still accessing support and structure.

These recommendations that involve improving and expanding school mental health programs, are in line with the conclusions advanced in the document entitled *Achieving the Promise: Transforming Mental Health Care in America* that was published in 2003 by the President's New Freedom Commissions on Mental Health. This document cited research indicating that youth with emotional disturbances have the highest rate of school failure with 50% of these students dropping out of high school in comparison with 30% of all students who have a disability (United States Department of Education Office of Special Education Programs, 2003). As explained by the President's New Freedom Commissions on Mental Health (2003), early detection and prevention of mental health problems, as well as delivering mental health services and supports early, are important to avoid long-term or permanent negative consequences. An effective way of addressing the issue is to create a partnership between schools and mental health providers. School-

based mental health programs can attend to the needs and concerns of all children, which can help ensure academic achievement as well as their overall functioning in and outside of school. The commission noted that efforts to address mental health problems in the schools need to include collaboration between parents and local mental health providers, early screenings and assessment, prevention efforts, as well as effective interventions. The Columbia University TeenScreen program was discussed as an example of a model program that focuses on identification and early intervention. The TeenScreen program involves several steps: obtaining parental consent and child assent, administering several screening instruments, then students who are found "at-risk" are interviewed by a clinician to determine if further evaluation is warranted, and finally students who are identified as needing additional services are assigned a case manager who will ensure the implementation of appropriate intervention (Columbia University TeenScreen Program, 2005). This program, even though intensive and comprehensive, illustrates a more systematic, proactive, and effective way of identifying students at risk for and/or having mental health problems. *Achieving the Promise: Transforming Mental Health Care in America* (2003) also discusses the need to address the co-occurrence of mental health disorders and substance use, as this co-occurrence worsens during adulthood if it remains untreated (Substance Abuse and Mental Health Services Administration, 2002).

Limitations of the Current Study

Several precautions were taken during the design of the study and data collection process to reduce potential threats to validity. The remaining threats to validity inherent to the design of the study and features of the sample are delineated next.

Internal validity. Internal validity is the degree to which a study is confound-free (Goodwin, 2006). In the current study, some extraneous factors could not be controlled for and thus reduce the current study's internal validity. Such factors include students' attitudes towards substance use and mental health, the influence of the family and their beliefs, and possible protective factors (e.g., the support of the family and parent involvement, involvement of students in other structured activities that are not school-based, religious beliefs). Those factors were not examined systematically in the current study and might have significantly impacted participants' self-disclosure of substance use and mental health problems, as well as impacted their actual behaviors and beliefs in unknown ways. Such problems are common to studies with non-experimental designs, as multiple factors more distal from the research questions cannot be controlled.

Ecological validity. Ecological validity is the extent to which findings from one study can be generalized to other populations and across settings. When ecological validity is affected, it can lead to erroneous conclusions if results are generalized to populations in different settings without taking into account unique characteristics of the sample. In the current study, all participants were current students at a primarily low SES high school located in Florida with a large population of Hispanic students. The results obtained in this study may not generalize to other populations or across settings due to the many unique characteristics of the current sample. As a result, the findings of the study may not generalize to a higher SES high school or to other ethnic groups.

Population validity. Population validity refers to the ability to generalize the results of a sample to a population. Due to the use of a convenience sampling method to collect data at a pre-selected high school, as well as the requirement for active parent

consent and active student assent to participate in the current study, the students in the current sample may differ significantly from students in the overall population. The unique characteristics of students who chose to participate in the study and whose parents allowed participation may differ from students who refused to participate and/or failed to return the consent forms, as well as whose parents declined participation. This problem is also referred to as sampling bias. Due to the target population being studied (i.e., adolescents), as well as the sensitive subject areas (i.e., substance use, depression, anxiety), active parental consent is almost always required by the Institutional Review Board (IRB) and the Ethics Review Boards (ERB). Passive consent procedures would improve the likelihood of obtaining random sample of adolescents which would also improve the probability of obtaining a representative sample (Baker, Yardley, & McCaul, 2001). It has been discussed and documented in previous research (Baker et al., 2001; Beck, Collins, Overholser, & Terry, 1984; Weinberger, Tublin, Ford, & Feldman, 1990; White, Hill, & Effendi, 2004) that studies requiring active parental consent have a higher rate of sampling bias and a lower sample size as a result of the underrepresentation of certain populations (e.g., students at risk for engaging in problem behaviors such as substance use, students who are not satisfied, students with parents that might be less educated). Baker and colleagues stated that "adolescents with the highest risk profiles are those least likely to obtain parental consent" and that by requiring active parental consent when studying adolescents "researchers run the risk of losing the very subjects that are the targets of their research or interventions" (p. 608). Furthermore, as stated previously, active parental consent may have led to a lower sample size. The sample size for the study is fairly small (138 participants) with a low response rate (10.3%). The sample size

may limit the likelihood that the participants' scores on the measured variable are representative of the overall population at the participating school.

In addition to a sampling bias or nonresponse bias, which makes it more difficult and risky to draw conclusion about a population, a social desirability bias may have also affected the results. Since a survey method was use in the current study, students may have responded to survey questions based on how they think they should answer or what is expected and their answers may not reflect what they truly feel and their true behaviors (Goodwin, 2006). This limitation should be noted even though surveys were anonymous, as surveys were completed in the school setting and around a few other students, with adults present in the room. Ensuring participants' complete anonymity may help reduce the social desirability bias, but it may have not eliminated the problem. Another limitation is that all the information in the archival dataset came from only one source, adolescents' self-report, which might result in source bias. Moreover, biases might occur due to normal mood changes that youth experience during adolescence. The instruments used to assess current and/or recent anxiety and depressive symptomalogy may have also limited the findings as past levels of symptomalogy were not assessed and might have influenced substance use in the past year.

Another important limitation to consider is the possibility for Type I errors. The large number of comparisons that were made, including the use of numerous variables in the logistic regression models, increased the possibility of making a Type I error. A Type I error occurs when the null hypothesis is rejected when it is in fact true, and no significant differences actually exist between the two groups (e.g., substance user vs. no use of substances). Significant differences obtained in the current study between students

who reported using substances and those who did not should be interpreted with caution pending independent replication of findings.

Directions for Future Research

The current study attempted to comprehensively examine the interrelationships between adolescent substance use, anxiety, and depression, as well as student involvement in school-based extracurricular activities. The current study is among the first to examine school avoidance as a form of anxiety, as well as one of the few studies to examine various categories of school-based extracurricular activities and their unique contributions to student outcomes. A greater understanding of the relationship between mental health problems, substance use, and school involvement in extracurricular activities adds to the literature by providing more detailed information on these topics specific to students attending a predominantly low-SES high school with a large Hispanic student population. Future replications of this study with larger samples that are more representative of typical U.S. students are needed, in part to confirm the existence of relationships suggested by the current study as well as to address threats to validity. Future research efforts should focus on limiting non-response or sampling biases, for instance by sending follow-up reminders and/or distributing consent forms multiple times to students who do not initially return parent consent forms. Future research should also consider the use of a longitudinal, prospective design to limit errors and biases inherent to reliance on self-report data of past behaviors, attitudes, feelings, and moods.

Efforts made towards preventing substance use and internalizing problems such as depression and anxiety among high school students are essential due to the numerous deleterious effects these psychological conditions have on students' short-term and long-

term educational outcomes. Replication of this study will add to the existing literature base and may strengthen the rationale for the need to develop effective school-based preventive programs for youth who are at-risk of using/abusing substances and/or at risk of developing mental health problems.

Final Thoughts

Results of the current study suggest a substantial percentage of students serving a predominantly Hispanic and low-SES school experience clinical levels of anxiety disorders and depression, as well as substance use (particularly alcohol use). Such findings should be conveyed to educators of such populations in part to raise their awareness of the mental health needs of their students. Current findings support important links between students' report of school avoidance and use of cigarettes and marijuana, underscoring the relationship between forms of anxiety and student substance use. Furthermore, inverse links between cigarette use and involvement in particular school-based extracurricular activities (i.e., prosocial/academic clubs and special interest clubs) were noted. These results may provide a further rationale for efforts to encourage availability and use of school-based activities that are structured.

References

Albano, A. M., Chorpita, B. F., & Barlow, D. H. (2003). Childhood mood disorders. In Mash, E. J. & Barkley, R. A. *Child psychopathology* (pp. 279-329). New York: The Guilford Press.

Aloise-Young, P., & Chavez, E. (2002). Not all school dropouts are the same: Ethnic differences in the relation between reason for leaving school and adolescent substance use. *Psychology in the Schools, 39,* 539-547.

Amaro, H., Blake, S. M., Schwartz, P. M., & Flinchbaugh, L. J. (2001). A review of substance abuse prevention interventions for young adolescent girls. *The Journal of Early Adolescence, 21,* 294-324.

American Psychiatric Association (2000). *Diagnostic and Statistical Manual of Mental Disorders*, Fourth Edition, Text Revision. Washington, DC, American Psychiatric Association.

Angold, A., & Costello, E. J. (2001). The epidemiology of depression in children and adolescents. In I. M. Goodyer (Ed.), *The depressed child and adolescent* (pp. 143-178). New York: Cambridge University Press.

Angold, A., Costello, E. J., Erkanli, A., & Worthman, C. M. (1999). Pubertal changes in hormone levels and depression in girls. *Psychological Medicine, 29,* 1043-1053.

Armstrong, T. D., & Costello, E. J. (2002). Community studies on adolescent substance use, abuse, or dependence and psychiatric comorbidity. *Journal of Consulting and Clinical Psychology, 70,* 1224–1239.

Baker, J. R., Yardley, J. K., & McCaul, K. (2001). Characteristics of responding-, nonresponding-, and refusing-parents in an adolescent lifestyle choice study. *Evaluation Review, 25*, 605-618.

Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychology research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology, 51*, 1173-1182.

Beck, S., Collins, L., Overholser, J., & Terry, K. (1984). A comparison of children who receive and who do not receive permission to participate in research. *Journal of Abnormal Child Psychology, 12*, 573-580.

Bettes, A. B., Dusenbury, L., Kerner, J., James-Ortiz, S., & Botvin, G. J. (1990). Ethnicity and psychosocial factors in alcohol and tobacco use in adolescence. *Child Development, 61*, 557-565.

Bhatia, S. K., & Bhatia, S. C. (2007). Childhood and adolescent depression. *American Family Physician, 75*, 73-80.

Birmaher, B., Khetarpal, S., Cully, M., Brent, D., & McKenzie, N. S. (1997). The screen for child anxiety related emotional disorders (SCARED): Scale construction and psychometric characteristics. *Journal of the American Academy of Child & Adolescent Psychiatry, 36*, 545-553.

Birmaher, B., Brent, D. A., Chiappetta, L., Bridge, J., Monga, S, & Baugher, M (1999). Psychometric properties of the screen for child anxiety related emotional disorders (SCARED): A replication study. *Journal of the American Academy of Child & Adolescent Psychiatry, 38*, 1230-1236.

Bittner, A., Egger. H. L., Erkanli, A., Costello, E. J., Foley, D. L. & Angold, A. (2007).

What do childhood anxiety disorders predict? *Journal of Child and Psychiatry, 48,* 1174-1183.

Bogart, Collins, Ellickson, & Klein, (2006). Adolescent predictors of generalized health risk in young adulthood: A 10-year longitudinal assessment. *Journal of Drug Issues, 36,* 571-596.

Bohnert, A. M. & Garber, J. (2007). Prospective relations between organized activity participation and psychopathology during adolescence. *Journal of Abnormal Child Psychology, 35,* 1021-1033.

Boyd, R. C., Ginsburg, G. S., Lambert, S. F., Cooley, M. R., & Campbell, K. D. (2003). Screen for child anxiety related emotional disorders (SCARED): Psychometric properties in an African-American parochial high school sample. *Journal of the American Academy of Child & Adolescent Psychiatry, 42,* 1188-1196.

Brady, K. T., & Randall, C. L. (1999). Gender differences in substance use disorders. *Psychiatric Clinics of North America, 22,* 241-252.

Bryant, A. L., Schulenberg, J. E. O'Malley, P. M., Bachman, J. G., & Johnston, L. D. (2003). How academic achievement, attitudes, and behaviors relate to the course of substance use during adolescence: A 6-year, multiwave national longitudinal study. *Journal of Research on Adolescence, 13,* 361-397.

Chang, G., Sherritt, L., & Knight, J. R. (2005). Adolescent cigarette smoking and mental health symptoms. *Journal of Adolescent Health, 36,* 517-522.

Chassin, L., Pitts, S.C., DeLucia, C., & Todd, M. (1999). A longitudinal study of children of alcoholics: Predicting young adult substance use disorders, anxiety, and depression. *Journal of Abnormal Psychology, 108,* 106-119.

Children's mental health facts: Children and adolescents with anxiety disorders (2003). Retrieved on May 22, 2009 from http://mentalhealth.samhsa.gov/publications/Allpubs/CA-0007/default.asp.

Columbia University TeenScreen Program (2005). Retrieved on May 25, 2010 from http://www.sprc.org/featured_resources/bpr/ebpp_PDF/Columbia-teenscreen.pdf.

Comeau, N., Stewart, S. H., Loba, P. (2001). The relations of trait anxiety, anxiety sensitivity, and sensation seeking to adolescents' motivations for alcohol, cigarette, and marijuana use. *Addictive Behaviors, 26,* 803-825.

Cooley, M. R., & Boyce, C. A. (2004). An introduction to assessing anxiety in child and adolescent multiethnic populations: Challenges and opportunities for enhancing knowledge and practice. *Journal of Clinical Child and Adolescent Psychology, 33*, 210-215.

Costello, E. J., & Angold, A. (1995). Epidemiology. In March, J.S., editor. *Anxiety Disorders in Children and Adolescents*. (pp. 109–124) New York: Guilford.

Costello, E.J., Egger, H. L., & Angold, A. (2004). Developmental epidemiology of anxiety disorders. In T.H. Ollendick & J.S. March (Eds.), *Phobic and anxiety disorders in children and adolescents (*pp. 61-91). New York: Oxford University Press.

Costello, E. J., Egger, H. L., & Angold, A. (2005). 10-year research update review: The epidemiology of child and adolescent psychiatric disorders: I. Methods and Public Health Burden. *Journal of the American Academy of Child & Adolescent Psychiatry, 44*, 972-986.

Costello, E. J., Erkanli, A., & Angold, A. (2006). Is there an epidemic of child or

adolescent depression? *Journal of Child Psychology and Psychiatry, 47*, 1263-1271.

Crocetti, E., Hale, W. W., Fermani, A., Raaijmakers, Q., & Meeus, W. (2009). Psychometric properties of the Screen for Child Anxiety Related Emotional Disorders (SCARED) in the general Italian adolescent population: A validation and a comparison between Italy and the Netherlands. *Journal of Anxiety Disorders, 23*, 824-829.

Darling, N. (2005). Participation in extracurricular activities and adolescent adjustment: Cross-sectional and longitudinal findings. *Journal of Youth and Adolescence, 34*, 493-505.

Dewey, J. D. (1999). Reviewing the relationship between school factors and substance use for elementary, middle, and high school students. *Journal of Primary Prevention, 19*, 177-225.

Diego, M. A., Field, T. M., & Sanders, C. E. (2003). Academic performance, popularity, and depression predict adolescent substance use. *Adolescence, 38,* 35-42.

Eccles, J. S., & Barber, B. L. (1999). Student council, volunteering, basketball, or marching band: What kind of organized involvement matters? *Journal of Adolescent Research, 14,* 10-43.

Ellickson, P.L, McGuigan, K.A., Adams, V., Bell, R.M., & Hays, R.D. (1996). Teenagers and alcohol misuse in the United States: By any definition, it's a big problem. *Addiction, 91*, 489-503.

Engberg, J., & Morral, A. R. (2006). Reducing substance use improves adolescents' school attendance. *Addiction, 101*, 1741-1751.

Evans, J. R., Van Velsor, P., & Schumacher, J. E. (2002). Addressing adolescent depression: A role for school counselors. *Profession School Counseling, 5,* 211-219.

Farmer, T. J. (2002). The experience of major depression: Adolescents' perspectives. *Issues in Mental Health Nursing, 23,* 567-585.

Fergusson, D. M., Horwood, L. J., & Ridder, E. M. (2007). Conduct and attentional problems in childhood and adolescence and later substance use, abuse, and dependence: Results of a 25-year longitudinal study. *Drug and Alcohol Dependence, 88,* 14-26.

Florida Differentiated Accountability Program 2008-2009 School Improvement Plan. Retrieved on May 18, 2009 from http://www.flbsi.org/0809_sip_template/Public/print.aspx?uid=292421.

Fredricks, J. A., & Eccles, J. S. (2006). Is extracurricular participation associated with beneficial outcomes? Concurrent and longitudinal relations. *Developmental Psychology, 42*, 698-713.

Goodwin, C. J. (2006). *Research in Psychology: Methods and Design, 4th Edition.* Hoboken, NJ: John Wiley & Sons, Inc.

Hale, W. W., Raaijmakers, Q., Muris, P., & Meeus, W. (2005). Psychometric properties of the screen for child related emotional disorders (SCARED) in the general adolescent population. *Journal of the American Academy of Child & Adolescent Psychiatry, 44,* 283-290.

Hammen, C., & Rudolph, K. D. (2003). Childhood mood disorders. In Mash, E. J. & Barkley, R. A. *Child Psychopathology* (pp. 233-278). New York: The Guilford

Press.

Harbor, R. (2008). *The Teen Alcohol and Drug Use Scale*. Unpublished measure, University of South Florida

Harbor, R. (2008). *Participation in School-Related Activities Questionnaire*. Unpublished Measure, University of South Florida

Hawkins, Catalano, & Miller, 1992). Risk and protective factors for alcohol and other drug problems in adolescence and early adulthood: Implications for substance abuse prevention. *Psychological Bulletin, 112,* 64-105.

Hays, R.D. & Ellickson, P.L. (1996). Associations between drug use and deviant behavior in teenagers. *Addictive Behaviors, 21*, 291-302.

Herman, K. C., Merrell, K. W., Reinke, W. M., & Tucker, C. M. (2004). The role of school psychology in preventing depression. *Psychology in the schools, 41*, 763-774.

Hillsborough County Public Schools: School Improvement Plan 2008-2009. Retrieved on May 18, 2009 from http://www.sdhc.k12.fl.us/SIPReports/20082009/ SIPReport.asp? SiteNumber=2421.

Holmbeck, G. H. (1997). Toward terminological, conceptual, and statistical clarity in the study of mediators and moderators: Examples from the child-clinical and pediatric psychology literatures. *Journal of Consulting and Clinical Psychology*, *65*, 599-610.

Huberty, T. J. (2008). Best practices in school-based interventions for anxiety and depression. In Thomas, A. & Grimes, J. *Best Practices in School Psychology V* (pp. 1473-1486). Bethesda: The National Association of School Psychologists.

Johnston, L.D., O'Malley, P. M., Bachman, J. G. & Schulenberg, J. E. (2007). *Monitoring the future national results on adolescent drug use: Overview of key findings, 2006*. (NIH Publication No. 07-6202). Bethesda, MD: National Institute on Drug Abuse.

Kandel, D. B., Yamagushi, K., & Chen, K. (1992). Stages of progression in drug involvement from adolescence to adulthood: further evidence for the gateway theory. *Journal of Studies on Alcohol, 53*, 447-457.

Kaplow, J. B., Curran, P. J., Angold, A., & Costello, E. J. (2001). The prospective relation between dimensions of anxiety and the initiation of adolescent alcohol use. *Journal of Clinical Child Psychology, 30,* 316-326.

Kearney, C. A. (2008). School absenteeism and school refusal behavior in youth: A contemporary review. *Clinical Psychology Review, 28*, 451-471.

Kearney, C. A., & Albano, A. M. (2004). The functional profiles of school refusal behavior: Diagnostic aspects. *Behavior Modification, 28*, 147-161.

Kessler, R. C., Berglund, P., Demler, O., Jin, R., Merikangas, K. R., and Walters, E. E. (2005). Lifetime prevalence and age-of-onset distributions of DSM-IV disorders in the national comorbidity survey replication. *Archives of General Psychiatry, 62*, 593-602.

Kessler, R. C., Avenevoli, S., & Merikangas, K. R. (2001). Mood disorders in children and adolescents: an epidemiologic perspective . *Biological Psychiatry, 49,* 1002-1014.

Kessler, R. C., Foster, M. P. H., Saunders, W. B., & Stang, P. E. (1995). Social consequences of psychiatric disorders I: educational attainment. *American*

Journal of Psychiatry, *152,* 1026-1032.

Kessler, R. C., & Walters, E. E. (1998). Epidemiology of DSM-III-R major depression and minor depression among adolescents and young adults in the National Comorbidity Survey. *Depression and Anxiety, 7,* 3-14.

King, S. M., Iacono, W. G., & McGue, M. (2004). Childhood externalizing and internalizing psychopathology in the prediction of early substance use. *Addiction, 99,* 1548-1559.

Lennox, R. D. & Cecchini, M. A (2008). The Narconon drug education curriculum for high school students: A non-randomized, controlled prevention trial. *Substance Abuse Treatment, Prevention, and Policy, 3,* 1747-1759.

Lewinsohn, P. M., Gotlib, I. H., Lewinsohn, M., Seeley, J. R., & Allen, N. B. (1998). Gender differences in anxiety disorders and anxiety symptoms in adolescents. *Journal of Abnormal Psychology*, *107,* 109-117.

Lewinsohn, P. M., Zinbarg, R., Seeley, J. R., Lewinsohn, M., & Sack, W. H. (1997). Lifetime comorbidity among anxiety disorders and between anxiety disorders and other mental disorders in adolescents. *Journal of Anxiety Disorders, 11,* 377-394.

Lillehoj, C. J., Trudeau, L., Spoth, R., & Madon, S. (2005). Externalizing behaviors as predictors of substance initiation trajectories among rural adolescents. *Journal of Adolescent Health, 37,* 493-501.

Linyan, S., Kai, W., Fang, F., Yi, S., and Xueping, G. (2008). Reliability and validity of the screen for child anxiety related emotional disorders (SCARED) in Chinese children. *Journal of Anxiety Disorders, 22,* 612-621.

Luthar, S., & Ansary, N. (2005). Dimensions of adolescent rebellion: Risks for academic

failure among high and low income youth. *Developmental Psychopathology, 17,* 231-250.

Maag, J. W., & Irvin, D. M. (2005). Alcohol use and depression among African-American and Caucasian adolescents. *Adolescence, 40,* 87-101.

Mahoney, J. L., & Stattin, H. (2000). Leisure activities and adolescent antisocial behavior: The role of structure and social context. *Journal of Adolescence. 23,* 113-127.

Mash, E. J. & Barkley, R. (2003). *Child Psychopathology*. New York: The Guilford Press

Mattis, A. G., & Ollendick, T. H. School refusal and separation anxiety (2003). In M. Hersen (Ed.) Clinical Behavior Therapy: Adults and Children (pp. 304-325). New York: Wiley.

McCarthy, J., Downes, E. J., & Sherman, C. A. (2008). Looking back at adolescent depression: A qualitative study. *Journal of Mental Health Counseling, 30,* 49-68.

McGuire, L. C., & Flynn, L. (2003). The Columbia TeenScreen program: Screening youth for mental illness and suicide. TEN, *5,* 56-62.

Merrell, K. W. (2008). *Helping Students Overcome Depression and Anxiety*. New York: The Guilford Press.

Myers, C. (1990). *Classical and modern regression with applications.* Boston: Allyn & Bacon.

Orme, J. G., Reis, J., & Herz, E. J. (1986). Factorial and discriminant validity of the center for epidemiological studies depression (CES-D) scale. *Journal of Clinical Psychology, 42,* 28-33.

Parker, K. D., Calhoun, T., & Weaver, G. (2000). Variables associated with adolescent

alcohol use: A multiethnic comparison. *The Journal of Social Psychology*, *140*, 51-62.

Peck, S. C., Roeser, R. W., & Eccles, J. S. (2008). Exploring the roles of extracurricular activity quantity and quality in the educational resilience of vulnerable adolescents: Variable- and pattern- centered approaches. *Journal of Social Issues, 64*, 135-155.

Phillips, G. A., Shadish, W. R., Murray, D. M., Kubik, M., Lytle, L. A., & Birnbaum, A. S. (2006). The center for epidemiologic studies depression scale with a young adolescent population. *Multivariate Behavioral Research, 41,* 147-163.

Piko, B. F. (2006). Adolescent smoking and drinking: The role of communal mastery and other social influences. *Addictive Behaviors, 31*, 102-114.

Posner, S. F., Stewart, A. L., Marin, G., & Perez-Stable, E. J. (2001). Factor variability of the center for epidemiological studies depression scale (CES-D) among urban Latinos. *Ethnicity & Health, 6,* 137-144.

Poulin, C., Hand, D., Boudreau, B., & Santor, D. (2005). Gender differences in the association between substance use and elevated depressive symptoms in a general adolescent population. *Addiction, 100,* 525-535.

President's New Freedom Commission on Mental Health (2003). Achieving the promise: Transforming Mental Health Care in America. Retrieved on May 25, 2010 from http://www.mentalhealthcommission.gov/reports/FinalReport/toc.html.

Radloff, L. S. (1977). The CES-D scale: a self-report depression scale for research in the general population. *Applied Psychological Measurement, 1,* 385-401.

Results from the 2007 National Survey on Drug Use and Health: National Findings

(2008). Retrieved on May 24, 2009 from http://www.oas.samhsa.gov/ nsduh/ 2k7nsduh/ 2k7Results.pdf.

Roberts, E. R., Roberts, C. R., Chen, Y. R. (1997). Ethnocultural differences in prevalence of adolescent depression. *American Journal of Community Psychology, 25*, 95-110.

Rohde, P., Lewinsohn, P., & Seeley, J. R. (1996). Psychiatric Comorbidity with Problematic Alcohol Use in High School Students. *Journal of the American Academy of Child & Adolescent Psychiatry, 35*, 101-109.

Rushton, J.L., Forcier, M, & Schectman, R.M. (2002). Epidemiology of depressive symptoms in the National Longitudinal Study of Adolescent Health. *Journal of American Child Adolescent Psychiatry, 41*, 199-205.

Shaffer, D., Wilcox, H., Lucas, C., Hicks, R., Busner, C., & Parides, M.S. (1996). The development of a screening instrument for teens at risk for suicide. Poster presented at the 1996 meeting of the American Academy of Child and Adolescent Psychiatry, New York, NY.

Snodgrass, H. (2009). *Adolescent response to peer substance use*. Unpublished master's thesis, University of South Florida, Tampa, FL.

Substance Abuse and Mental Health Services Administration (2002). Report to congress on the prevention and treatment of co-occurring substance abuse disorders and mental health disorders. Bethesda, MD: Substance Abuse and Mental Health Services Administration.

Sutherland, I. & Shepherd, J. P. (2001). Social dimensions of adolescent substance use. *Addiction, 96*, 445-458.

The Depressed Child (2008). Retrieved on May 22, 2009 from http://www.aacap.org/cs/Root/facts_for_families/the_depressed_child.

The National Survey on Drug Use and Health (2008). Retrieved May 23, 2009 from http://www.oas.samhsa.gov/nsduh/2k7nsduh/2k7Results.pdf

United States Department of Education Office of Special Education Programs (2003). Twenty-third annual report to congress on the implementation of the Individuals with Disabilities Education Act: Results. U.S. Department of Education, Office of Special Education Programs.

Valentiner, D. P., Mounts, N. S., & Deacon, B. J (2004). Panic attacks, depression and anxiety symptoms, and substance use behaviors during late adolescence. *Anxiety Disorders, 18,* 573-585.

Van Amerigen, M., Mancini, C., & Farvolden, P. (2003). The impact of anxiety disorders on educational achievement. *Journal of Anxiety Disorders, 17,* 561-571.

Wagner F. A., Anthony J.C. (2007). Male-female differences in the risk of progression from first use to dependence upon cannabis, cocaine and alcohol. *Drug and Alcohol Depend, 86,* 191-198.

Wallace J. M., Bachman J. G., O'Malley P. M., Schulenberg J., Cooper S. M., Johnston L. D. (2003). Gender and ethnic differences in smoking, drinking, and illicit drug use among American 8th, 10th and 12th grade students, 1976-2000. *Addiction, 98,* 225-234.

Weinberger, D. A., Tublin, S. K., Ford, M. E., & Feldman, S. S. (1990). Preadolescents' social-emotional adjustment and selective attrition in family research. *Child Development, 61,* 1374-1386.

White, V. M., Hill, D. J., & Effendi, Y. (2004). How does active parental consent influence the findings of drug-use surveys in schools? *Evaluation Review, 28*, 246-260.

Woodward, L. J., & Fergusson, D. M. (2001). Life course outcomes of young people with anxiety disorders in adolescence. *Journal of the American Academy of Child & Adolescent Psychiatry, 40,* 1086-1093.

Young, S. E., Friedman, N. P., Miyake, A., Willcutt, E. G., Corley, R. P., Haberstick, B. C., & Hewitt, J. K. (2009). Behavioral Disinhibition: Liability for externalizing spectrum disorders and its genetic and environmental relation to response inhibition across adolescence. *Journal of Abnormal Psychology, 118,* 117-130.

Zoccolillo, M., Vitaro, F., & Tremblay, R.E. (1999). Problem drug and alcohol use in a community sample of adolescents. *Journal of the American Academy of Child & Adolescent Psychiatry, 38,* 900-907.

Appendices

Appendix A: Parent Consent Form

Dear Parent or Caregiver:

This letter provides information about a research study that will be conducted at X 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 X High School (X) 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 X High School.

- ✓ Why Your Child Should Participate: We need to learn more about what leads to alcohol and drug use while students are in 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 X 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 minutes. We will personally administer the questionnaires at X, during regular school hours in the Winter 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 X, 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
Department of Psychological and Social Foundations

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	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 B: 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 X 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 X 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 X 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 X 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 C: Demographics Questionnaire

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 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. Are you on Free or Reduced Lunch?
- ❍ 1. Yes
- ❍ 2. No

7. Do you attend school regularly
- ❍ 1. No
- ❍ 2. Sometimes
- ❍ 3. Yes

9. Including last year, and this year, have you received any discipline referrals for behaviors other than being tardy?
- ❍ 1. Often (More than 5)
- ❍ 2. Some (1-5)
- ❍ 3. Never

10. Including last year, and this year, have you been suspended out of school (including ATOSS)?
- ❍ 1. Often (More than 5 days total)
- ❍ 2. Some (1-5 days total)
- ❍ 3. Never

11. Including last year, and this year, have you been arrested?
- ❍ 1. Often (More than 2 times)
- ❍ 2. Some (1-2 times)
- ❍ 3. Never

12. Have you ever been diagnosed with ADHD?
- ❍ 1. Yes
- ❍ 2. No

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

14. Have you ever been prescribed medication for ADHD?
- ❍ 1. Yes, and I still take the medication.
- ❍ 2. Yes, but I no longer take medication.
- ❍ 3. No

15. 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 D: Teen Alcohol and Drug Use Scale

In the past 12 months, on how many occasions (if any) have you used the following drugs?	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)	1	2	3	4	5	6	7
10. Prescription drugs prescribed to you (e.g., Zanex, Prozac)	1	2	3	4	5	6	7
11. Ecstasy	1	2	3	4	5	6	7
12. Hallucinogens (e.g., LSD, Mushrooms)	1	2	3	4	5	6	7
13. Stimulants (uppers)	1	2	3	4	5	6	7
14. Barbiturates (downers)	1	2	3	4	5	6	7
15. Cocaine	1	2	3	4	5	6	7
16. Crack	1	2	3	4	5	6	7
17. Heroine (e.g., cheese)	1	2	3	4	5	6	7
18. Other _____	1	2	3	4	5	6	7

Appendix E: CES-D

Below is a list of the ways you might have felt or behaved. Please tell me how often you have felt this way during the **<u>past week</u>**. (Circle one number on each line)

During the past week…		**Rarely or none of the time (less than 1 day)**	**Some or a little of the time (1-2 days)**	**Occasionally or a moderate amount of time (3-4 days)**	**Most or all of the time (5-7 days)**
1	I was bothered by things that usually don't bother me.	**0**	**1**	**2**	**3**
2.	I did not feel like eating; my appetite was poor.	**0**	**1**	**2**	**3**
3.	I felt that I could not shake off the blues even with help from my family or friends.	**0**	**1**	**2**	**3**
4.	I felt I was just as good as other people.	**0**	**1**	**2**	**3**
5.	I had trouble keeping my mind on what I was doing.	**0**	**1**	**2**	**3**
6.	I felt depressed.	**0**	**1**	**2**	**3**
7.	I felt that everything I did was an effort.	**0**	**1**	**2**	**3**
8.	I felt hopeful about the future.	**0**	**1**	**2**	**3**
9.	I thought my life had been a failure.	**0**	**1**	**2**	**3**
10.	I felt fearful.	**0**	**1**	**2**	**3**
11.	My sleep was restless.	**0**	**1**	**2**	**3**
12.	I was happy.	**0**	**1**	**2**	**3**
13.	I talked less than usual.	**0**	**1**	**2**	**3**
14.	I felt lonely.	**0**	**1**	**2**	**3**
15.	People were unfriendly.	**0**	**1**	**2**	**3**
16.	I enjoyed life.	**0**	**1**	**2**	**3**
17.	I had crying spells.	**0**	**1**	**2**	**3**
18.	I felt sad.	**0**	**1**	**2**	**3**
19.	I felt that people dislike me.	**0**	**1**	**2**	**3**
20.	I could not get "going."	**0**	**1**	**2**	**3**

Appendix F: SCARED

Below is a list of sentences that describe how people feel. Read each phrase and decide if it is "Not True or Hardly Ever True" (**0**) or "Somewhat True or Sometimes True" (**1**) or "Very True or Often True" (**2**) for you. Then for each sentence, circle the number that corresponds to the response that seems to describe you for the last three months.

How much does this describe you for the last three months?	**Not True or Hardly Ever True**	**Somewhat True or Sometimes True**	**Very True or Often True**
1. I get headaches when I am at school. (Scl A)	**0**	**1**	**2**
2. I don't like to be with people I don't know well. (Soc A)	**0**	**1**	**2**
3. I worry about other people liking me. (GA)	**0**	**1**	**2**
4. I am nervous. (GA)	**0**	**1**	**2**
5. I feel nervous with people I don't know well. (Soc A)	**0**	**1**	**2**
6. I get stomachaches at school. (Scl A)	**0**	**1**	**2**
7. I worry about being as good as other kids. (GA)	**0**	**1**	**2**
8. I worry about going to school. (Scl A)	**0**	**1**	**2**
9. I worry about things working out for me. (GA)	**0**	**1**	**2**
10. I am a worrier. (GA)	**0**	**1**	**2**
11. It is hard for me to talk with people I don't know well.(Soc A)	**0**	**1**	**2**
12. People tell me that I worry too much. (GA)	**0**	**1**	**2**
13. I feel shy with people I don't know well. (Soc A)	**0**	**1**	**2**
14. I worry about what is going to happen in the future. (GA)	**0**	**1**	**2**
15. I worry about how well I do things. (GA)	**0**	**1**	**2**
16. I am scared to go to school. (Scl A)	**0**	**1**	**2**
17. I worry about things that have already happened. (GA)	**0**	**1**	**2**
18. I feel nervous when I am with other children or Adults and I have to do something while they watch me (for example: read aloud, speak, play a game, play a sport; Soc A)	**0**	**1**	**2**
19. I feel nervous when I am going to parties, dances, or any place where there will be people that I don't know well. (Soc A)	**0**	**1**	**2**
20. I am shy. (Soc A)	**0**	**1**	**2**

Note. GA = Generalized Anxiety scale, Soc A = Social Anxiety scale, and Scl A = School Anxiety scale.

Appendix G: Participation in School-Related Activities Questionnaire

How often do you participate in these activities or organizations at school?	**Circle the number that best describes how often?**				
	Three or more times a week	Once or twice a week	Once or twice a month	Less than once a month	Never
1. School Publications (i.e., Yearbook Staff, Newspaper, Literary Journal).	1	2	3	4	5
2. Music (i.e., Band, Orchestra, Chorus, etc)	1	2	3	4	5
3. Athletics (Baseball, Gymnastics, Cheerleading, etc)	1	2	3	4	5
4. Community Service (i.e., Anchor, Key Club, Keyettes, etc)	1	2	3	4	5
5. Drama/Thespians	1	2	3	4	5
6. Dance	1	2	3	4	5
7. Student Government	1	2	3	4	5
8. Business/Career (i.e., Fashion, Cosmetology, Culinary Arts, Computer, Law)	1	2	3	4	5
9. Language Clubs (i.e., French, Spanish, Asian, etc.)	1	2	3	4	5
10. ROTC	1	2	3	4	5
11. Social Clubs/Groups	1	2	3	4	5
12. Academic (i.e., National Honors Society, etc.)	1	2	3	4	5
13. Hobby Clubs (i.e., Chess, RC Cars, etc.)	1	2	3	4	5
14. Other: _____	1	2	3	4	5

Appendix H

Logistic Regression Analysis: Interaction Effects Yielded for Alcohol Use, Mental Health Problems, and Involvement in School-Based Extracurricular Activities

Interaction Terms	*B*	S.E	Wald's χ^2	*df*	*p*	Odds Ratio
Depression*Prosocial/ Academically Oriented Activities	-.003	.006	.286	1	.593	.997
Depression*Special Interest Clubs	.001	.006	.011	1	.917	1.001
Depression*Performing Arts Clubs	-.009	.009	1.025	1	.311	.991
Depression*Athletics	-.002	.012	.027	1	.870	.998
Generalized Anxiety* Prosocial/Academically Oriented Activities	-.007	.012	.342	1	.559	.993
Generalized Anxiety* Special Interest Clubs	.005	.012	.188	1	.665	1.005
Generalized Anxiety* Performing Arts Clubs	.005	.022	.052	1	.819	1.005
Generalized Anxiety* Athletics	-.012	.027	.181	1	.670	.988

Note. All values for interaction terms were obtained by first entering control variables (i.e., gender, grade, SES, and ethnicity), then the main effect of mental health problem, and finally the main effect of each extracurricular activity type for every logistic regression. A table was created for each of the three substance types.

*$p < .05$.

Logistic Regression Analysis: Interaction Effects Yielded for Alcohol Use, Mental Health Problems, and Involvement in School-Based Extracurricular Activities, continued

Predictor	*B*	S.E	Wald's χ^2	*df*	*p*	Odds Ratio
Social Anxiety* Prosocial/Academically Oriented Activities	.008	.018	.177	1	.674	1.008
Social Anxiety* Special Interest Clubs	.011	.019	.376	1	.540	1.011
Social Anxiety* Performing Arts Clubs	-.004	.023	.027	1	.869	.996
Social Anxiety* Athletics	-.007	.037	.033	1	.856	.993
School Avoidance* Prosocial/Academically Oriented Activities	.026	.040	.434	1	.510	1.026
School Avoidance* Special Interest Clubs	-.023	.040	.338	1	.561	.977
School Avoidance* Performing Arts Clubs	.034	.055	.386	1	.535	1.035
School Avoidance* Athletics	.081	.079	1.058	1	.304	1.084

Note. All values for interaction terms were obtained by first entering in the model all control variables (i.e., gender, grade, SES, and ethnicity), then the main effect of each mental health problem, and finally the main effect of each extracurricular activity type for every logistic regression. A table was created for each of the three substance types.

*$p < .05$.

Logistic Regression Analysis: Interaction Effects Yielded for Cigarette Use, Mental Health Problems, and Involvement in School-Based Extracurricular Activities

Predictor	*B*	S.E	Wald's χ^2	*df*	*p*	Odds Ratio
Depression*Prosocial/ Academically Oriented Activities	.012	.013	.802	1	.371	1.012
Depression*Special Interest Clubs	-.004	.009	.148	1	.701	.996
Depression*Performing Arts Clubs	-.006	.011	.323	1	.570	.994
Depression*Athletics	-000	.015	.000	1	.987	1.000
Generalized Anxiety* Prosocial/Academically Oriented Activities	.034	.024	2.034	1	.154	1.558
Generalized Anxiety* Special Interest Clubs	.026	.021	1.507	1	.220	1.027
Generalized Anxiety* Performing Arts Clubs	.034	.029	1.376	1	.241	1.035
Generalized Anxiety* Athletics	.049	.037	1.754	1	.185	1.051

Note. All values for interaction terms were obtained by first entering control variables (i.e., gender, grade, SES, and ethnicity), then the main effect of mental health problem, and finally the main effect of each extracurricular activity type for every logistic regression. A table was created for each of the three substance types.

*$p < .05$.

Logistic Regression Analysis: Interaction Effects Yielded for Cigarette Use, Mental Health Problems, and Involvement in School-Based Extracurricular Activities, continued

Interaction Terms	*B*	S.E	Wald's χ^2	*df*	*p*	Odds Ratio
Social Anxiety* Prosocial/Academically Oriented Activities	.056	.032	3.047	1	.081	1.058
Social Anxiety* Special Interest Clubs	.047	.029	2.676	1	.102	1.048
Social Anxiety* Performing Arts Clubs	-.013	.031	.184	1	.668	.987
Social Anxiety* Athletics	.106	.053	3.992	1	.046*	1.112
School Avoidance* Prosocial/Academically Oriented Activities	.125	.067	3.498	1	.061	1.133
School Avoidance* Special Interest Clubs	.017	.056	.091	1	.763	1.017
School Avoidance* Performing Arts Clubs	.138	.084	2.698	1	.100	1.148
School Avoidance* Athletics	.057	.103	.304	1	.581	1.058

Note. All values for interaction terms were obtained by first entering in the model all control variables (i.e., gender, grade, SES, and ethnicity), then the main effect of each mental health problem, and finally the main effect of each extracurricular activity type for every logistic regression. A table was created for each of the three substance types.

*$p < .05$.

Logistic Regression Analysis: Interaction Effects Yielded for Marijuana Use, Mental Health Problems, and Involvement in School-Based Extracurricular Activities

Interaction Terms	*B*	S.E	Wald's χ^2	*df*	*p*	Odds Ratio
Depression*Prosocial/ Academically Oriented Activities	-.001	.009	.013	1	.909	.999
Depression*Special Interest Clubs	-.006	.007	.599	1	.439	.994
Depression*Performing Arts Clubs	-.014	.011	1.633	1	.201	.986
Depression*Athletics	-.004	.014	.066	1	.797	.996
Generalized Anxiety* Prosocial/Academically Oriented Activities	.000	.018	.000	1	.997	1.000
Generalized Anxiety* Special Interest Clubs	.000	.015	.000	1	.997	1.000
Generalized Anxiety* Performing Arts Clubs	.027	.029	.901	1	.343	1.028
Generalized Anxiety* Athletics	0.24	.035	.472	1	.492	1.024

Note. All values for interaction terms were obtained by first entering control variables (i.e., gender, grade, SES, and ethnicity), then the main effect of mental health problem, and finally the main effect of each extracurricular activity type for every logistic regression. A table was created for each of the three substance types.

*$p < .05$.

Logistic Regression Analysis: Interaction Effects Yielded for Marijuana Use, Mental Health Problems, and Involvement in School-Based Extracurricular Activities, continued

Predictor	*B*	S.E	Wald's χ^2	*df*	*p*	Odds Ratio
Social Anxiety* Prosocial/Academically Oriented Activities	.001	.026	.001	1	.972	1.001
Social Anxiety* Special Interest Clubs	.013	.025	.272	1	.602	1.013
Social Anxiety* Performing Arts Clubs	-.021	.031	.461	1	.497	.979
Social Anxiety* Athletics	.050	.050	.968	1	.325	1.051
School Avoidance* Prosocial/Academically Oriented Activities	- .046	.052	.774	1	.379	.955
School Avoidance* Special Interest Clubs	-.090	.051	3.070	1	.080	.914
School Avoidance* Performing Arts Clubs	.011	.072	.022	1	.881	1.011
School Avoidance* Athletics	.092	.103	.796	1	.372	1.096

Note. All values for interaction terms were obtained by first entering in the model all control variables (i.e., gender, grade, SES, and ethnicity), then the main effect of each mental health problem, and finally the main effect of each extracurricular activity type for every logistic regression. A table was created for each of the three substance type.

*$p < .05$.

Appendix I

Logistic Regression Analysis: Main Effects Yielded for Alcohol Use, Mental Health Problems, and Involvement in Prosocial/Academically Oriented Activities

	B				
Predictor					
Gender	-.071	.002	.042	.055	.050
Age	.244	.325	.312	.296	.311
SES	-.496	-.462	-.491	-.530	-.494
African American[a]	-.465	-.297	-.338	-.219	-.339
Asian[a]	-2.162	-1.940	-2.035	-2.135	-2.054
Hispanic[a]	.308	.451	.430	.473	.432
Multiracial/Other[a]	.345	.338	.253	.296	.251
Depression		.024			
Prosocial/Academic Clubs		-.073			
Generalized Anxiety			.002		
Prosocial/Academic Clubs			-.082		
Social Anxiety				-.093	
Prosocial/Academic Clubs				-.081	
School Avoidance					-.012
Prosocial/Academic Clubs					-.083

Note. All main effect variables take into account all seven covariates. Coefficients reported in the table are log- odds units. For gender, 0 = Male, 1 = Female. For SES, 1 = student receives free or reduced- price lunch, 2 = student does not qualify for free or reduced-price lunch. [a] For ethnicity, the reference category is white.

*$p < .05$.

Logistic Regression Analysis: Main Effects Yielded for Alcohol Use, Mental Health Problems, and Involvement in Special Interest Clubs

	B				
Predictor					
Gender	-.071	-.129	-.084	-.060	-.095
Age	.244	.250	.231	.225	.236
SES	-.496	-.454	-.492	-.536	-.487
African American[a]	-.465	-.455	-.498	-.366	-.496
Asian[a]	-2.162	-2.062	-2.178	-2.283	-2.151
Hispanic[a]	.308	.341	.302	.350	.303
Multiracial/Other[a]	.345	.450	.354	.391	.349
Depression		.029			
Special Interest Clubs		.034			
Generalized Anxiety			.004		
Special Interest Clubs			.023		
Social Anxiety				-.093	
Special Interest Clubs				.010	
School Avoidance					.017
Special Interest Clubs					.023

Note. All main effect variables take into account all seven covariates. Coefficients reported in the table are log- odds units. For gender, 0 = Male, 1 = Female. For SES, 1 = student receives free or reduced- price lunch, 2 = student does not qualify for free or reduced-price lunch. [a] For ethnicity, the reference category is white.

*$p < .05$.

Logistic Regression Analysis: Main Effects Yielded for Alcohol Use, Mental Health Problems, and Involvement in Performing Arts Clubs

	B				
Predictor					
Gender	-.071	-.121	-.084	-.066	-.072
Age	.244	.261	.239	.225	.233
SES	-.496	-.413	-.444	-.487	-.449
African American[a]	-.465	-.602	-.651	-.525	-.659
Asian[a]	-2.162	-2.127	-2.224	-2.327	-2.257
Hispanic[a]	.308	.358	.325	.372	.325
Multiracial/Other[a]	.345	.626	.527	.565	.536
Depression		.028			
Performing Arts Clubs		.097			
Generalized Anxiety			-.003		
Performing Arts Clubs			.094		
Social Anxiety				-.092	
Performing Arts Clubs				.088	
School Avoidance					-.020
Performing Arts Clubs					.095

Note. All main effect variables take into account all seven covariates. Coefficients reported in the table are log- odds units. For gender, 0 = Male, 1 = Female. For SES, 1 = student receives free or reduced- price lunch, 2 = student does not qualify for free or reduced-price lunch. [a] For ethnicity, the reference category is white.

*$p < .05$.

Logistic Regression Analysis: Main Effects Yielded for Alcohol Use, Mental Health Problems, and Involvement in Athletic Activities

	B				
Predictor					
Gender	.009	-.010	.019	.024	.016
Age	.231	.238	.222	.220	.224
SES	-.524	-.486	-.521	-.572	-.519
African American[a]	-.558	-.513	-.563	-.439	-.563
Asian[a]	-2.178	-2.074	-2.188	-2.280	-2.179
Hispanic[a]	.261	.294	.261	.305	.262
Multiracial/Other[a]	.249	.366	.278	.288	.275
Depression		.023			
Athletics		.038			
Generalized Anxiety			.003		
Athletics			.027		
Social Anxiety				-.093	
Athletics				-.009	
School Avoidance					.006
Athletics					.027

Note. All main effect variables take into account all seven covariates. Coefficients reported in the table are log- odds units. For gender, 0 = Male, 1 = Female. For SES, 1 = student receives free or reduced- price lunch, 2 = student does not qualify for free or reduced-price lunch. [a] For ethnicity, the reference category is white.

*$p < .05$.

Logistic Regression Analysis: Main Effects Yielded for Cigarette Use, Mental Health Problems, and Involvement in Prosocial/Academically Oriented Activities

	B				
Predictor					
Gender	.002	.183	.270	.276	.074
Age	-.125	.017	.006	.005	.048
SES	.167	.209	.101	.106	.160
African American[a]	-.337	.230	.008	.020	.067
Asian[a]	-20.020	-19.518	-19.730	-19.720	-19.328
Hispanic[a]	-.295	-.019	-.112	-.100	-.158
Multiracial/Other[a]	.131	.058	-.165	-.159	-.155
Depression		.036			
Prosocial/Academic Clubs		-.286*			
Generalized Anxiety			.015		
Prosocial/Academic Clubs			-.293*		
Social Anxiety				-.048	
Prosocial/Academic Clubs				-.284*	
School Avoidance					.229
Prosocial/Academic Clubs					-.285*

Note. All main effect variables take into account all seven covariates. Coefficients reported in the table are log- odds units. For gender, 0 = Male, 1 = Female. For SES, 1 = student receives free or reduced- price lunch, 2 = student does not qualify for free or reduced-price lunch. [a] For ethnicity, the reference category is white.

*$p < .05$.

Logistic Regression Analysis: Main Effects Yielded for Cigarette Use, Mental Health Problems, and Involvement in Special Interest Clubs

	B				
Predictor					
Gender	.002	-.030	.064	.092	-.155
Age	-.125	-.018	-.026	-.038	.013
SES	.167	.228	.133	.102	.174
African American[a]	-.337	-.009	-.148	-.007	-.125
Asian[a]	-20.020	-19.698	-19.847	-19.822	-19.392
Hispanic[a]	-.295	-.250	-.287	-.253	-.344
Multiracial/Other[a]	.131	.317	.102	.129	.140
Depression		.036			
Special Interest Clubs		-.181*			
Generalized Anxiety			-.012		
Special Interest Clubs			-.189*		
Social Anxiety				-.073	
Special Interest Clubs				-.193*	
School Avoidance					.257
Special Interest Clubs					-.193*

Note. All main effect variables take into account all seven covariates. Coefficients reported in the table are log- odds units. For gender, 0 = Male, 1 = Female. For SES, 1 = student receives free or reduced- price lunch, 2 = student does not qualify for free or reduced-price lunch. [a] For ethnicity, the reference category is white.

*$p < .05$.

Logistic Regression Analysis: Main Effects Yielded for Cigarette Use, Mental Health Problems, and Involvement in Performing Arts Clubs

	B				
Predictor					
Gender	.002	-.063	.000	-.001	-.173
Age	-.125	-.093	-.125	-.135	-.072
SES	.167	.270	.175	.150	.217
African American[a]	-.337	-.237	-.364	-.305	-.260
Asian[a]	-20.020	-19.852	-20.028	-20.043	-19.585
Hispanic[a]	-.295	-.235	-.292	-.268	-.355
Multiracial/Other[a]	.131	.358	.157	.176	.098
Depression		.041			
Performing Arts Clubs		.022			
Generalized Anxiety			-.002		
Performing Arts Clubs			.013		
Social Anxiety				-.056	
Performing Arts Clubs				.009	
School Avoidance					-.014
Performing Arts Clubs					-.927

Note. All main effect variables take into account all seven covariates. Coefficients reported in the table are log- odds units. For gender, 0 = Male, 1 = Female. For SES, 1 = student receives free or reduced- price lunch, 2 = student does not qualify for free or reduced-price lunch. [a] For ethnicity, the reference category is white.

*$p < .05$.

Logistic Regression Analysis: Main Effects Yielded for Cigarette Use, Mental Health Problems, and Involvement in Athletic Activities

	B				
Predictor					
Gender	.002	-.080	-.020	-.037	-.172
Age	-.125	-.063	-.088	-.091	-.048
SES	.167	.253	.166	.141	.246
African American[a]	-.337	-.172	-.354	-.285	-.279
Asian[a]	-20.020	-19.898	-20.049	-20.039	-19.603
Hispanic[a]	-.295	-.242	-.293	-.255	-.326
Multiracial/Other[a]	.131	.172	-.022	-.003	.028
Depression		.037			
Athletics		-.128			
Generalized Anxiety			-.006		
Athletics			-.138		
Social Anxiety				-.068	
Athletics				-.162	
School Avoidance					.239
Athletics					-.109

Note. All main effect variables take into account all seven covariates. Coefficients reported in the table are log- odds units. For gender, 0 = Male, 1 = Female. For SES, 1 = student receives free or reduced- price lunch, 2 = student does not qualify for free or reduced-price lunch. [a] For ethnicity, the reference category is white.

*$p < .05$.

Logistic Regression Analysis: Main Effects Yielded for Marijuana Use, Mental Health Problems, and Involvement in Prosocial/Academically Oriented Activities

	B				
Predictor					
Gender	.302	.452	.496	.517	.341
Age	.012	.114	.102	.093	.141
SES	-.664	-.634	-.677	-.676	-.628
African American[a]	-1.472	-1.190	-1.217	-1.124	-1.212
Asian[a]	-20.441	-20.157	-20.227	-20.308	-19.930
Hispanic[a]	-.527	-.379	-.399	-.385	-.437
Multiracial/Other[a]	-1.314	-1.405	-1.459	-1.497	-1.482
Depression		.016			
Prosocial/Academic Clubs		-.145			
Generalized Anxiety			.028		
Prosocial/Academic Clubs			-.157		
Social Anxiety				-.095	
Prosocial/Academic Clubs				-.150	
School Avoidance					.188
Prosocial/Academic Clubs					-.143

Note. All main effect variables take into account all seven covariates. Coefficients reported in the table are log- odds units. For gender, 0 = Male, 1 = Female. For SES, 1 = student receives free or reduced- price lunch, 2 = student does not qualify for free or reduced-price lunch. [a] For ethnicity, the reference category is white.

*$p < .05$.

Logistic Regression Analysis: Main Effects Yielded for Marijuana Use, Mental Health Problems, and Involvement in Special Interest Clubs

	B				
Predictor					
Gender	.302	.305	.334	.365	.183
Age	.012	.055	.036	.027	.084
SES	-.664	-.647	-.692	.715	-.646
African American[a]	-1.472	-1.404	-1.432	-1.252	-1.435
Asian[a]	-20.441	-20.284	-20.389	-20.474	-20.034
Hispanic[a]	-.527	-.495	-.528	-.497	-.558
Multiracial/Other[a]	-1.314	-1.241	-1.297	-1.347	-1.332
Depression		.022			
Special Interest Clubs		-.037			
Generalized Anxiety			-.019		
Special Interest Clubs			-.046		
Social Anxiety				-.104	
Special Interest Clubs				-.058	
School Avoidance					.216
Special Interest Clubs					-.041

Note. All main effect variables take into account all seven covariates. Coefficients reported in the table are log- odds units. For gender, 0 = Male, 1 = Female. For SES, 1 = student receives free or reduced- price lunch, 2 = student does not qualify for free or reduced-price lunch. [a] For ethnicity, the reference category is white.

*$p < .05$.

Logistic Regression Analysis: Main Effects Yielded for Marijuana Use, Mental Health Problems, and Involvement in Performing Arts Clubs

	B				
Predictor					
Gender	.302	.280	.307	.316	.164
Age	.012	.030	.003	-.014	.060
SES	-.664	-.617	-.666	-.686	-.626
African American[a]	-1.472	-1.530	-1.545	-1.400	-1.495
Asian[a]	-20.441	-20.332	-20.446	-20.550	-20.077
Hispanic[a]	-.527	-.494	-.531	-.503	-.562
Multiracial/Other[a]	-1.314	-1.157	-1.231	-1.271	-1.315
Depression		.025			
Performing Arts Clubs		.035			
Generalized Anxiety			.022		
Performing Arts Clubs			.027		
Social Anxiety				-.097	
Performing Arts Clubs				.021	
School Avoidance					.221
Performing Arts Clubs					.007

Note. All main effect variables take into account all seven covariates. Coefficients reported in the table are log- odds units. For gender, 0 = Male, 1 = Female. For SES, 1 = student receives free or reduced- price lunch, 2 = student does not qualify for free or reduced-price lunch. [a] For ethnicity, the reference category is white.

*$p < .05$.

Logistic Regression Analysis: Main Effects Yielded for Marijuana Use, Mental Health Problems, and Involvement in Athletic Activities

	B				
Predictor					
Gender	.351	.180	.196	.173	.094
Age	.007	.104	.090	.090	.126
SES	-.691	-.670	-.699	-.725	-.638
African American[a]	-1.539	-1.448	-1.507	-1.366	-1.455
Asian[a]	-20.501	-20.316	-20.383	-20.457	-20.073
Hispanic[a]	-.570	-.550	-.574	-.530	-.582
Multiracial/Other[a]	-1.384	-1.518	-1.575	-1.634	-1.557
Depression		.016			
Athletics		-.266			
Generalized Anxiety			.011		
Athletics			-.273		
Social Anxiety				-.128	
Athletics				-.330*	
School Avoidance					.169
Athletics					-.253

Note. All main effect variables take into account all seven covariates. Coefficients reported in the table are log- odds units. For gender, 0 = Male, 1 = Female. For SES, 1 = student receives free or reduced- price lunch, 2 = student does not qualify for free or reduced-price lunch. [a] For ethnicity, the reference category is white.

*$p < .05$.