MEASURING NON-MEDICAL PRESCRIPTION DRUG USE AND ASSOCIATED RISK-TAKING BEHAVIORS AMONG ADOLESCENTS

By

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To be a philosopher is not merely to have subtle thoughts, nor even to found a school, but so to love wisdom as to live according to its dictates, a life of simplicity, independence, magnanimity, and trust.
- Henry David Thoreau, Walden, 1854

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Although there is considerable research on adolescent substance use, limited data exist on the non-medical use and abuse of prescription drugs. The purposes of this investigation were to design reliable and valid measures of non-medical prescription drug use to be incorporated into a comprehensive health risk behavior assessment and to describe the relationships between non-medical prescription drug use and additional health risk behaviors. The study's methodology took place in three stages: 1) the design, expert panel review, and revision of instrument items, 2) the pilot testing of these items among a convenient sample of 209 students in grades 9-12 at a Northwest Florida Public High School, and 3) the administration of the final questionnaire to 485 12th grade students at two Northwest Florida High Schools (different from the pilot study). Results of the study revealed that lifetime prevalence of non-medical use of any prescription drug use was relatively high among participants at 31.9%. When reported by class of abusable prescription drug, participants most readily reported having used pain relievers non-

medically in their lifetime (28.6%), followed by depressants (12.7%) and stimulants (9.0%).

Multiple logistic regression analyses were used to assess the covariance of non-medical prescription drug use with selected health risk behaviors relevant to adolescents. Results indicated that non-medical prescription drug use was significantly associated with multiple health risk behaviors including tobacco, alcohol, and illicit drug use; violence; depression and suicide ideation; sexual risk-taking; and problem weight loss strategies. These findings suggest that non-medical prescription drug use behaviors are not isolated events in the lives of youth. Rather, the behaviors covary with other health risk behaviors suggesting that non-medical prescription drug use is linked to a syndrome of problem behavior. The study's findings may be applied to improve youth risk behavior surveillance systems and to better inform policy, prevention, and treatment initiatives related to the non-medical use and abuse of prescription drugs.

CHAPTER 1
INTRODUCTION TO THE STUDY

Throughout the history of modern medicine, prescription drugs have made tremendous positive changes in the health of the United States and the world, and today they play an increasingly important role in restoring, maintaining, and improving health and well-being. Additionally, for the millions of Americans that rely on prescription drugs for therapeutic purposes, they can lead to dramatic improvements in the quality of life.

In 2003, 3.4 billion prescriptions were filled in the U.S., a 70% increase in number of prescriptions filled just 10 years prior (2.0 billion). When compared to the U.S. population growth of 13% during that same time period, the average number of prescriptions per capita increased from 7.8 to 11.8 (Kaiser Family Foundation, 2004). Clearly, the use of prescription medication has increased in the U.S. as a result of demands by an emerging older population that relies on drug therapy to stay healthy, and to advances in medical technology which have led to hundreds of new drug approvals by the U.S. Food and Drug Administration (FDA) in the past 10 years (U.S. Food and Drug Administration [U.S. FDA], 2005).

With an understanding that indicated prescription drug use generally improves health, most people who take prescription drugs take them responsibly. National general population surveys of prescription drug use consistently find that the vast majority of prescribed use of psychotherapeutic drugs is conservative, therapeutically appropriate, and generally limited to short periods of time. Furthermore, when taken properly for

medical purposes, the benefit-to-risk ratio of for these substances is generally positive with little evidence that abusive use of prescribed drugs is common (Peterson, 1993).

Yet, when abused or used for non-medical purposes, many prescription drugs can have effects that hinder, rather than enhance lives. The non-medical use of prescription drugs is defined as using a prescription drug that was not prescribed for you or that was taken only for the experience or feeling it caused (Substance Abuse and Mental Health Services Administration [SAMHSA], 2004a). According to the National Institute on Drug Abuse (NIDA), the non-medical use or abuse of prescription drugs is a "serious public health concern" (2001b, p. 1) and several indicators suggest that it is increasing in magnitude in the U.S., particularly among young people (Johnston, O'Malley, Bachman, & Schulenburg, 2005b).

Just as with the abuse of alcohol or illicit drugs such as marijuana, cocaine, or heroin, prescription drug abuse and non-medical use may lead to addiction, serious financial, emotional, social, and legal problems, and in extreme cases may lead to disability or death (Zacny et al., 2003). Although prescription drug abuse is not a new phenomenon in this country, it is one that deserves renewed research attention. This investigation will increase the understanding of non-medical prescription drug use among adolescents and, enhance surveillance measures currently available to monitor this type of drug use among youth.

Statement of the Research Problem

While the rates of illicit drug, alcohol, and tobacco use have declined among teens in recent years, the non-medical use and abuse of controlled prescription drugs has been steadily rising (Johnston et al., 2005b). When placed into perspective relative to other types of youth drug abuse, the prevalence of non-medical prescription drug use ranks

fourth, after alcohol, cigarettes, and marijuana respectively (Johnston et al., 2005b). While many types of prescription drugs can be abused, the three major classes of drugs used by youth for their mood altering properties include opioid pain relievers, central nervous system (CNS) stimulants, and CNS depressants. According the National Survey of Drug Use and Health (SAMHSA, 2004a), between 1992 and 2003 the rate of non-medial use of controlled prescription drugs among 12- to 17- year olds increased 212 percent. Additionally, new use of prescription opioids among teens is up 542 percent, more than four times the rate of increase among adults (SAMHSA, 2004a).

Indicators of the problem's seriousness include drug-related emergency department visits and mortality. *The DAWN Report* (SAMHSA, 2003b), a publication monitoring drug-related emergency department hospital visits and deaths, noted that benzodiazepines, analgesics, and antidepressants represented nearly 30% of drugs referenced in emergency department reports in 2001. Yet well-known illicit drugs (e.g., cocaine, heroin, and marijuana) continue to receive most of the research attention in drug abuse research and remain the primary focus of most prevention efforts. Furthermore, according to the Florida Office of Drug Control, one-third of all drug-related deaths in the state during 2002 were the result of prescription drug abuse (Chun, 2003).

Adolescence is a developmental period of rapid physical, psychological, sociocultural, and cognitive changes (DiClemente, Hansen, & Ponton, 1996). While it marks the transition from childhood to adulthood, it is characterized by efforts to confront and surmount challenges and to establish a sense of identity and autonomy. It also remains a period associated with high rates of substance abuse, including that involving

prescription drugs due to biological and environmental factors (e.g., psychosocial, family, peer) (Kaminer & Bukstein, 1998).

Both theory and research suggest that drug taking behaviors are not isolated events in the lives of adolescents. Problem Behavior Theory (Jessor & Jessor, 1977) contends that adolescent problem behaviors (i.e., alcohol, marijuana abuse, delinquency, precocious sexual activity) are associated with one another and are inversely related to conventional behaviors (i.e., church attendance, school performance) (Donovan, Jessor, & Costa 1988, 1991). The theory postulates that the covariation of problem behaviors is related to an underlying common factor that reflects "unconventionality," and represents a "syndrome" of problem behavior (Donovan & Jessor, 1985). While the present study will not attempt to explain the underlying causes or antecedents of prescription drug abuse, the idea that risk behaviors tend to cluster in vulnerable adolescents is the grounding framework for this study.

Data from national population surveys of drug use suggest that teens who use prescription drugs for recreational purposes are twice as likely to use alcohol, five times more likely to use marijuana, 12 times more likely to use heroin, 15 times more likely to use ecstasy, and 21 times more likely to use cocaine, compared to teens who do not use such drugs (SAMHSA, 2004a). National data also report that high school seniors who use prescription opioids for their psychoactive effects are more likely to be involved in other deviant behaviors (i.e., school expulsion, skipping school, bringing drugs to school, getting high at parties, having friends who use marijuana) (McCabe, Boyd, & Teter, 2005). Studies conducted with smaller samples confirm national reports that prescription adolescents using prescription drugs non-medically report higher rates of cigarette

smoking, alcohol, marijuana, ecstasy, and cocaine use, and other problem behaviors that lead to unintentional injury (i.e., drove after binge drinking, passenger with a drunk driver) (Boyd, McCabe, & Teter, 2006; McCabe & Boyd et al., 2005).

Findings from empirical studies suggest that adolescent risk behaviors are correlated; that is, engaging in one behavior may indicate an increased likelihood for engaging in other behaviors or patterns of risk behavior (Dryfoos, 1990; Jessor, Donovan, & Costa, 1991). Specifically, numerous studies confirm that substance abusing behaviors in adolescence are not only related to each other (i.e., tobacco, alcohol, and illicit substance abuse) (Abdel-Ghany & Wang, 2003; Everett, Giovino, Warren, Crossett, & Kann, 1998) but have also been correlated with behaviors that put adolescents at risk for unintentional injury (McCabe, 2005; McCabe, Teter, & Boyd, 2004), aggressive and violent behaviors (Orpinas, Basen-Engquist, Grunbaum, & Parcel, 1995; Valois, McKeown, Garrison, & Vincent, 1995; Silverman, Raj, Mucci, & Hathaway, 2001), decreased physical activity (Pate, Heath, Dowda, & Trost, 1996; Winnail, Valois, McKeown, Saunders, & Pate, 1995), problem weight loss tactics (Neumark-Sztainer, Story, Dixon, & Murray, 1998; Rafiroiu, Sargent, Parra-Medina, Drane, & Valois, 2003), sexual experience and risk taking (Shrier & Crosby, 2003; Shrier, Emans, Woods, & DuRant, 1996; Valois, Oeltmann, Waller, & Hussey, 1999) and depression/suicide ideation (Barrios, Everett, Simon, & Brenner, 2000; Garrison, McKeown, Valois, & Vincent, 1993). Collectively, these facts logically suggest that prescription drug abuse, a subset of substance abuse, may also be related to a “syndrome” of risk taking.

However, because items related to non-medical prescription drug use are not present on surveys assessing multiple risk behaviors (i.e., CDC’s Youth Risk Behavior

Survey [YRBS]) we know little about whether this type of drug use is also associated with other risk behaviors leading to social and health problems in adolescents. Although substance use correlates of recreational prescription drug use have been examined (McCabe, Teter, & Boyd, 2005, 2004; McCabe, Teter, Boyd, & Guthrie, 2004), no previous research has been conducted to investigate relationships—if any—prescription drug abuse may have with additional adolescent risk behaviors such as involvement in violence, risky sexual behavior, depression and suicide ideation, physical inactivity, or problem weight loss practices.

Furthermore, when non-medical prescription drug use behaviors and their correlates are reported in research studies, generally only one class of drugs is reported at a time (i.e., opioids, stimulants, or depressants) ((McCabe, Teter, & Boyd, 2005, 2004; McCabe, Teter, Boyd, & Guthrie, 2004). While the unauthorized use of each of these classes of drugs can compromise health, they each have unique effects on the nervous system (NIDA, 2001b) and differ with respect to peer norms regarding the drugs, beliefs about the dangers of the drugs, and perceived availability by adolescents (Johnston et al., 2005b). No previous studies have made an attempt to report the risk behavior correlates of all three classes of abusable prescription drugs concurrently. The existing body of knowledge would therefore be enhanced if a study were to report all three classes of prescription drugs when assessing co-morbidity so that differential levels of risk can be considered.

The YRBS is one of three federally funded surveys assessing adolescent drug use prevalence; Monitoring the Future (MTF), and the National Survey of Household Drug Use and Health (NSDUH) are the others. Although the design, implementation, and

documentation of all three surveys have been deemed of high quality (Cowan, 2001), the YRBS is the only one that does not include measures of non-medical prescription drug use (other than steroid use), although psychoactive prescription drug abuse is a major contributor to drug-related morbidity in teens. Adding non-medical prescription drug use items to the YRBS will only serve to enhance the federal surveillance methods used to estimate prevalence and trends of substance use among youth.

This study will expand upon the CDC's YRBS— one of the most widely used surveys monitoring behaviors which place youth at risk for injury and disease— by adding items that measure non-medical prescription drug use. By assessing the prevalence and correlates of this type of drug use among adolescents, the study may provide policy-makers, health behavior researchers, and health educators with a better understanding of the scope of non-medical prescription drug use.

Purpose of the Study

This investigation examined the relationship between non-medical prescription drug use and other risk behaviors among adolescents using a modified version of the YRBS, the Santa Rosa County Health Behavior Survey. The purposes of this study were to (1) design reliable and valid measures of adolescent prescription drug use to be incorporated into the YRBS; (2) describe the relationships between non-medical prescription drug use and other adolescent risk behaviors; (3) improve monitoring and tracking systems; (4) raise awareness among public health professionals about risks of non-medical prescription drug use among adolescents; (5) inform policy, prevention, and treatment measures related to non-medical prescription drug use and abuse; and (6) encourage inclusion of prescription drug items on surveys that monitor drug use and youth risk behaviors.

Significance of the Study

Although there is considerable research on adolescent substance use, limited data exist on the non-medical use of prescription drugs. To better inform policy, prevention, and treatment initiatives, it has been suggested that national surveys of drug use should include specific items that measure prescription drug use and abuse behaviors (National Center on Addiction and Substance Abuse [NCASA], 2005). One such national survey is the CDC's YRBS (Centers for Disease Control and Prevention [CDC], 2005). By adding items relating to non-medical prescription drug use to the YRBS, federal agencies will be able to inform policy by improving monitoring and tracking systems.

Healthy People 2010 (Office of Disease Prevention and Health Promotion [ODPHP], 2000) a report of the nation's health objectives for the coming decade, dedicated a chapter to substance abuse as a leading health indicator, identifying the nation's goal as to: "Reduce substance abuse to protect the health, safety, and quality of life for all, especially children" (p. 26-3). However, in outlining the issues and trends, the report highlights alcohol first, and then turns to "illicit drugs," identifying marijuana, cocaine, heroin, acid, inhalants, and methamphetamine, in arguing the serious consequences of substance use and abuse. Although *Healthy People 2010* (ODPHP, 2000) includes objectives related to reducing adverse consequences of substance use (e.g., drug-induced deaths, drug-related hospital emergency department visits) and identifies "substance-free youth" (p. 26-11) as a goal, prescription drugs are never explicitly identified as part of the problem. Considering prescription drugs are the third most commonly used class of psychoactive drugs for recreational purposes among adolescents, the findings from this investigation may alert public health agencies to the importance of including prescription drug abuse measures on federally funded surveys.

As a precursor to making associations between variables of interest on a survey, it is necessary to first establish validity and reliability of the items assessing those variables. The primary importance of this study lies in the assertion that it will generate items providing adequate estimates of prescription drug use behaviors among adolescents.

Furthermore, this study is informed by Problem Behavior Theory, which provides evidence for a "syndrome" of problem behavior (Jessor et al., 1991; Jessor & Jessor, 1977). The present study will also help provide additional evidence for the concept that risk taking behaviors do not occur in isolation and that prescription drug abuse may be part of a constellation of risk taking among adolescents. Only after fully understanding the scope and severity of non-medical prescription drug use among adolescents will health education and prevention specialists be able to tailor interventions that address prescription drugs as part of the larger problem of drug use and abuse.

Research Questions

The eight research questions for this study were formulated for a sample of 12th grade students. They included:

1. Is there a relationship between illicit drug use (i.e., marijuana, cocaine, inhalants, heroin, methamphetamine, ecstasy, and steroids) and non-medical prescription drug use?

2. Is there a relationship between tobacco use and non-medical prescription drug use?
3. Is there a relationship between alcohol use and non-medical prescription drug use?

4. Is there a relationship between sexual risk behaviors and non-medical prescription drug use?

5. Is there a relationship between violence-related behaviors and non-medical prescription drug use?

6. Is there a relationship between depression and suicide ideation and non-medical prescription drug use?

7. Is there a relationship between decreased physical activity and non-medical prescription drug use?

8. Is there a relationship between the use of problem weight loss tactics and non-medical prescription drug use?

Delimitations

The following delimitations should be considered when interpreting the results from this investigation:

1. This study enlisted a cross-sectional census survey design using a group administered paper-pencil questionnaire.

2. Participants in this study included 12th grade students enrolled in two senior high schools during the spring of 2006.

3. Participants included 12th grade students attending class on the day the survey was administered in the selected schools during the spring of 2006.

4. Participants included 12th grade students from the study population who voluntarily agreed to participate in the study.

5. Participants included only 12th grade students who obtained passive parental consent.

6. Participants were able to read and understand the directions, the questions, and the respective response options necessary to complete the questionnaire.

7. Findings from this study were based on self-report data collected by using the Santa Rosa County Health Behavior Survey.

Limitations

The following limitations should be considered when interpreting the results from this investigation:

1. Data collected from cross-sectional survey designs only reflect responses from participants at a specific point in time and therefore cannot establish causation.

2. Findings from this study cannot be generalized to other populations of adolescents.

3. Students who were absent on the day of data collection were excluded from the study.

4. Students who did not voluntarily agree to participate were excluded from the study.

5. Students who do not obtain passive parental consent were excluded from the study.

6. Variations in student reading ability and comprehension may have affected study results.

7. The study design relied on self-reported data, limiting the ability to determine the extent of over-reporting or under-reporting data.

Assumptions

For the purposes of this study, the following assumptions were made:

1. The students who participated in the study adequately represented the students enrolled in the schools.

2. The students who participated in the study were able to read and understand the directions, the questions, and provide the response options necessary to complete the questionnaire.

3. The students who agreed to participate in the study completed the Santa Rosa County Health Behavior Survey honestly.

4. The Santa Rosa County Health Behavior Survey was a valid and reliable instrument for collecting health behavior data from adolescents.

5. The research design was considered appropriate for the purpose of the study.

Definition of Terms

Addiction: A chronic, relapsing disease, characterized by compulsive drug seeking and use and by neurochemical and molecular changes in the brain. (NIDA, 2001b)

Adolescence: The period of transition from late childhood to early adulthood corresponding roughly to the period between the ages of 10 and 19. (World Health Organization [WHO], 1986)

Adolescent: In this study, twelfth grade students, with an approximate age range of 17-18, were referred to as adolescents.

Barbiturates: A sub-class of CNS depressant drugs prescribed for anxiety, insomnia, and convulsions, sometimes referred to as *sedatives*. They are older and less frequently prescribed than barbiturates. (Julien, 2001)

Benzodiazepines: A sub-class of CNS depressant drugs with with hypnotic, anxiolytic, anticonvilsant, amnestic, and muscle relaxant properties sometimes often referred to as *tranquilizers.* (Julien, 2001)

Central nervous system (CNS): The brain and spinal cord. (NIDA, 2001b)

CNS depressants: A class of drugs that slow CNS function, some of which are used to treat anxiety and sleeping disorders; includes barbiturates and benzodiazepines. (Julien, 2001)

CNS stimulants: Drugs that enhance the activity of the brain and lead to increased heart rate, blood pressure, and respiration; medically used to treat disorders such as narcolepsy and attention-deficit hyperactivity disorder. (Doweiko, 2002)

Controlled drug: A drug whose distribution and use is closely monitored by the Federal Drug Enforcement Agency (DEA) because of potential for abuse or risk. Drugs with the highest abuse potential are placed in *Schedule* I, and those with the lowest abuse potential are in *Schedule* V. (U.S. Drug Enforcement Administration [U.S. DEA], n.d.)

Dependence: An adaptive physiological state that can occur with regular drug use and results in withdrawal when drug use is discontinued. (NIDA, 2001b)

Dopamine: A neurotransmitter present in regions of the brain that regulate movement, emotion, motivation, and feelings of pleasure. (NIDA, 2001b)

Health risk behaviors: The variety of behaviors that put adolescents at risk for injury and disease. In this study, health risk behaviors include tobacco, alcohol, and other drug use; behaviors that compromise personal safety including driving under the influence of alcohol and violence; sexual behaviors; depression and suicide ideation; lack of physical activity; and problem weight loss practices. (CDC, 2005)

Non-medical prescription drug use: The use of prescription therapeutic drugs without a physician's permission or taken only for the experience or feeling it caused. (SAMHSA, 2004a)

Norepinephrine: A neurotransmitter present in some areas of the brain and the adrenal glands; decreases smooth muscle contraction and increases heart rate; often released in response to low blood pressure or stress. (NIDA, 2001b)

Opioids: Controlled drugs or narcotics most often prescribed for the management of pain; natural or synthetic chemicals based on opium's active component - morphine - that work by mimicking the actions of pain-relieving chemicals produced in the body. (NIDA, 2005d)

Polydrug abuse: The abuse of two or more drugs at the same time, such as CNS depressant abuse accompanied by abuse of alcohol. (Rosenthal & Levounis, 2005)

Prescription drug abuse: A maladaptive pattern of prescription drug use leading to clinically significant impairment or distress as manifested by one or more behaviorally based criteria. These criteria include failure to fulfill major role obligations at work, school, or home; recurrent substance use in situations in which it is physically hazardous; recurrent substance-related legal problems; and continued use despite persistent or recurrent social problems caused by effects of the substance (American Psychiatric

Association [APA], 2000)

Psychotherapeutics: Drugs that have an effect on the function of the brain and that often are used to treat psychiatric disorders; can include opioids, CNS depressants, and stimulants. (NIDA, 2001b)

Tolerance: A condition in which higher doses of a drug are required to produce the same effect as experienced initially. (NIDA, 2001b)

Withdrawal: A variety of symptoms that occur after chronic use of some drugs is reduced or stopped. (NIDA, 2001b)

CHAPTER 2
REVIEW OF THE LITERATURE

Nonmedical Prescription Drug Use Defined

To understand the nature of nonmedical prescription drug use among adolescents, it is meaningful to first illustrate the various ways this type of drug use is referred to in the literature. Three terms used widely to indicate the use of prescription drugs in ways other than therapeutically intended include *misuse*, *nonmedical use,* and *abuse*. Though these terms are commonly used interchangeably, they have distinct meanings and attention should be given to the way in which they are defined.

Misuse generally refers to a patient's incorrect use of a medication. This includes taking it for other than the intended use, taking other than the prescribed amount, and taking it more frequently or for longer than prescribed. However, physician behavior may also lead to misuse when a medication is prescribed for the wrong ailment, at improper doses, or for longer than is necessary (Ling, Wesson, & Smith, 2005).

Abuse is perhaps, the term used most widely and with the widest range of definitions with reference to prescription drugs. The American Psychiatric Association's (APA) Diagnostic and Statistical Manual (2000) defines *abuse* as a maladaptive pattern of substance use leading to clinically significant impairment or distress as manifested by one or more behaviorally based criteria. These "criteria" include failure to fulfill major role obligations at work, school, or home; recurrent substance use in situations in which it is physically hazardous; recurrent substance-related legal problems; and continued use despite persistent or recurrent social problems caused by effects of the substance (APA,

2000). The U.S. Drug Enforcement Administration (U.S. DEA) defines *abuse* as the nonmedical use of drugs that are regulated under existing federal law into one of five schedules. These five schedules are based upon the substance's medicinal value, harmfulness, and potential for abuse or addiction (U.S. DEA, n.d.). It is apparent that the term "drug abuse" holds different meanings for different organizations. However, these differences are not trivial, as the definitions may be each tailored to address specific or policies concerned with the organization. The medical profession, concerned primarily with clinical issues, and law enforcement agencies, concerned with street diversion, have clearly adopted definitions relevant to their own practices.

Research agencies also have their own definitions for abuse, which are often broader in scope to reach a wider audience. The Institute of Medicine (1996) defines abuse as "any harmful use, irrespective of whether the behavior constitutes a 'disorder' in the DSM diagnostic nomenclature" (p. 3). The Substance Abuse and Mental Health Services Administration defines abuse as the nonmedical use of a substance for psychic effect, dependence, or suicide attempt or gesture (SAMHSA, 2003a). Although NIDA does not have an official definition of drug abuse, the agency often uses the phrase "nonmedical use of a substance" in their educational materials (Zacny et al., 2003, p. 217).

Nonmedical use has been defined as using a psychotherapeutic drug "even once, that was not prescribed for you, or that you took only for the feeling it caused" (SAMHSA, 2004b). Some researchers distinguish between nonmedical use and abuse. For example, Zacny et al. (2003) refer to any problematic prescription drug use (that has

not shown to meet DSM-IV criteria for substance abuse disorder) as *non-medical* whereas they define *abuse* as that which meets DSM-IV criteria.

However, as evidenced by the IOM and SAMHSA definitions above, *nonmedical use* is also frequently used interchangeably with *abuse*. In fact, overlapping of *all* three terms within the same institution, is not uncommon. In a single research report for example, NIDA cited, "the *nonmedical use* or *abuse* of prescription drug remains a serious public health concern" (p.1), and "the *misuse* of prescribed medications may be the most common form of drug *abuse* among the elderly" (p. 6) (NIDA, 2001b). A related document also equates *misuse* with any *nonmedical* use when citing the National Household Survey on Drug Use and Health (NIDA, 2005d).

In an attempt to define the use of prescription drugs in ways other than therapeutically intended, organizations have provided us with diverse yet, sometimes convergent definitions. This presents a potentially confusing situation for the researcher trying to select one definition that is "more correct" than another. Because there is no universally agreed upon meaning for any of these terms, indicators of problem prescription drug use will need to be classified in a systematic manner.

For the purpose of this review of the literature, *misuse* will be defined as the improper use of a drug (with regards to dosage, indication, timing, etc.). In this case, it is an inadvertent action that can sometimes be perpetuated by the provider. In their definitions of *nonmedical use* and *abuse*, agencies often include any use of prescription drugs without a doctor's orders (SAMHSA, 2004a). However, clinicians generally view this as misuse if it is for the medically intended purpose (Ling et al., 2005).

Nonmedical use and *abuse* will not be used interchangeably as in some research studies. Public health agencies often recognize both *abuse* and *nonmedical* use as any potentially problematic use that is intentional and deliberate, and has no corresponding medical benefit (SAMHSA, 2004a; NIDA, 2001b). Yet, the medical community generally acknowledges abuse only when impairment or distress presents itself on one or more forms (APA, 2000). Thus, the widely used definition provided by SAMHSA (2004a)— taking of prescription drug without a doctor's orders or only for the feeling it caused—will be used in characterizing nonmedical prescription drug use, but not abuse, which tends to have much more serious implications. Among young people, nonmedical use is most commonly associated with recreational or mood altering purposes but may also be associated with a suicide attempt, appetite suppression, or increased attentiveness and focus (Meadows, 2001; SAMHSA, 2002).

Classes of Prescription Drugs Used Nonmedically

While virtually all prescription drugs can be misused, three major classes of drugs are most commonly used nonmedically for their psychotherapeutic properties. The public health, prevention, and law enforcement communities express particular concern for the use of opioids, central nervous system (CNS), stimulants, and CNS depressants (National Drug Intelligence Center, 2002; NIDA, 2001b; SAMHSA, 2004a). Many prescription drugs in these three classes are controlled drugs, that is, are regulated by the federal government under the Controlled Substances Act of 1970, because of their abuse potential, addictive properties, and high risk for physical dependence (U.S. DEA, n.d.).

Opioids

Also referred to as narcotics, analgesics, pain killers, or pain relievers, opioids are most commonly prescribed in the clinical setting for their pain relieving properties but

may also be used to treat severe coughs and diarrhea (NIDA, 2001b). The family of opioids (meaning "like opiates") includes true opiates like morphine, derived from the opium poppy, as well as synthetic compounds whose chemical properties and biological actions resemble those of true opiates (Julien, 2001).

According to archaeological evidence, much of the early history of opium took place before the advent of written records. It is thought that ancient Man ingested the dried resin of the opium poppy to control pain, and treat children suffering from colic (Doweiko, 2002). It was not until the early 1800s however, that an active agent, a pure alkaloid base, was chemically isolated from opium to produce morphine (Doweiko, 2002). After the invention of the hypodermic needle in 1857 and the widespread use of morphine and opium on Civil War battlefields, it did not take long before a massive outbreak of opiate addiction took place in the U.S. (Doweiko, 2002). Throughout the history of modern medicine, the medical community has struggled to strike a balance between risk management strategies to prevent abuse, and the need for patients to have appropriate access to opioids (Zacny et al., 2002).

Opioids are prescribed for three types of pain: acute or short-lived pain, chronic malignant (cancer) pain, and chronic nonmalignant pain (Portenoy, 1992). They act by attaching to proteins called opioid receptors found in the brain, spinal cord, and gastrointestinal tract. When these drugs attach to opioid receptors, they block the transmission of pain messages in the brain (Julien, 2001). Opioids are thus, an important component of pain management in the clinical setting. However, like illicit opioids (e.g., heroin) they additionally affect regions of the brain that mediate what we perceive as pleasure, thus resulting in an initial sense of euphoria for the user (Julien, 2001).

Side effects of opioids include unclear thinking, dizziness, drowsiness, constipation, itching, and depending on the amount taken, depressed breathing. A large enough single dose could cause severe respiratory depression resulting in death (NIDA, 2001b). Some of the more commonly abused opioids include morphine, codeine (e.g., Tylenol 3) hydrocodone (e.g., Vicodin, Lortab), oxycodone (OxyContin, Percocet), hydromorphone (e.g., Dilaudid), propoxyphene (e.g., Darvon, Darvocet), and meperidine (e.g., Demerol) (NIDA, 2001b; Johnston et al., 2005b). Because of their moderate to high addictive properties, opioids are usually classified as Schedule II or III drugs (U.S. DEA, n.d.).

Stimulants

As with opioids, the use of central nervous system (CNS) stimulants, also known as psychostimulants or simply stimulants, dates back several thousands of years. In ancient Rome for example, Gladiators were thought to use stimulants to counter the effects of fatigue, gain energy, and fight longer. It has been common practice in modern combat for soldiers and aviators to use stimulants to induce wakefulness (Doweiko, 2002). Stimulants have chemical structures similar to key brain neurotransmitters called monoamines, which include norepinephrine and dopamine. Increasing levels of norepinephrine in the brain and body increases blood pressure, heart rate, and blood glucose; constricts blood vessels; and opens up the pathways of the respiratory system. An increase in dopamine is associated with a sense of euphoria that can accompany the use of these drugs (Julien, 2001; NIDA, 2001b).

The modern therapeutic uses of stimulants focus on treating narcolespsy, a sleep disorder, and attention deficit (hyperactivity) disorder (AD[H]D), although they were widely prescribed as recently as the 1980s for weight loss, depression, and asthma

(Julien, 2001; Doweiko, 2002). Though several families of drugs are classified as stimulants, prescription stimulants are generally grouped into the amphetamines or amphetamine-like drugs. Some of the commonly prescribed stimulants include methyphenidate (e.g., Ritalin, Concerta), amphetamine-dexatroamohetamine (e.g., Adderall), dextroamphetamine (Dexedrine), and sibutramine hydrochloride monohydrate (e.g., Meridia) (NIDA, 2001b; SAMHSA, 2004a).

Consequences of stimulant drug abuse include feelings of hostility or paranoia for the user. Also, taking high doses of a stimulant may result in dangerously high body temperatures and irregular heartbeat. These physiological effects increase a person's potential for cardiovascular failure and fatal seizures (NIDA, 2001b).

Prescription stimulants have high addictive potential resulting in a majority of them being classified as Schedule II drugs (U.S. DEA, n.d.). In recent years, drug abuse researchers have placed particular attention on the drugs used to treat AD[H]D (e.g., Ritalin, Aderall, Concerta). There has been some debate as to whether prescribed use of the drugs leads to substance abuse later on in life. However, experts agree that this is not the case (Farone & Wilens, 2003). Most young people who use these drugs nonmedically, do so to party, stay awake, study, or suppress appetite and often times do not attain them through their own prescriptions (Klein-Schwartz & McGrath, 2003).

Depressants

Central nervous system (CNS) depressants, also known as sedative-hypnotics, are substances that slow normal brain function. Because of their calming effects, depressants are often prescribed to treat epilepsy, anxiety, and sleep disorders (Julien, 2001). Depressants work in the brain affecting levels of gamma-aminobutyric acid (GABA), a neurotransmitter which facilitates communication between brain cells. When GABA is

in an excited state, it causes a person to feel sedation, relief from anxiety, anticonvulsant effects, and dilation of the blood vessels (Julien, 2001; NIDA, 2001b).

Two main types of drugs comprise the prescription depressants, barbiturates and benzodiazepines. Barbiturates, sometimes referred to as sedatives, have been used therapeutically to induce anesthesia, relieve anxiety, and treat seizures. Examples of barbiturates include mephobarbital (e.g., Mebaral) and pentobarbital sodium (e.g., Nembutal), (NIDA, 2001b). Benzodiazepines, sometimes referred to as tranquilizers, are newer and more widely used than barbiturates. They have largely replaced barbiturates because of their greater efficacy, lower abuse potential, and lower risk of inducing coma or fatal intoxication (Julien, 2001). Examples of benzodiazepines often prescribed to treat anxiety and panic disorder include include diazepam (e.g., Valium), alprazolam (e.g., Xanax), chlordiazepoxide HCl (e.g., Librium), clonazepam (e.g., Klonopin), and lorazepam (e.g., Ativan). Benzodiazepines with more sedating effects including triazolam (e.g., Halcion) and estrazolam (e.g., ProSom) are more commonly used to treat sleeping disorders (Julien, 2001).

Because of their addictive potential, depressants are classified as Schedules II-IV drugs. Short-acting, high potency benzodiazepines (e.g., Valium) are more likely to lead to addiction than slower- and longer-acting benzodiazepines (e.g., Librium), thus placing them at a higher schedule according to the DEA (U.S. DEA, n.d.). Young people who use prescription depressants nonmedically, generally do so for their calming and sedating psychoactive effects. Nonmedical users of depressants may also use them to counter the stimulatory effects of drugs such as cocaine or enhance the sedative effects of drug such as alcohol (Sheehan, Sheehan, Torres, Coppola, & Francis, 1991).

Long-term use of depressants leads to tolerance to the drug. If cessation occurs abruptly rather than through medically supervised tapering-off, the individual may experience serious withdrawal symptoms, including seizures, hallucinations, and in some cases, death. Barbiturates have a particularly high risk of inducing severe and potentially life-threatening withdrawal symptoms. In contrast, taking benzodiazepines rarely leads to death except when the drugs are used in combination with other drugs including alcohol.

Epidemiology of Nonmedical Prescription Drug Use

While rates of illicit drug use for the most part have been stable or declining in recent years, the abuse of controlled prescription drugs has been steadily increasing, particularly among young people (SAMHSA, 2004a; Johnson et al, 2005b). Evidence of this increase comes from a number of epidemiological databases including the National Household Survey on Drug Use and Health (NSDUH) (SAMHSA, 2004b), the Monitoring the Future (MTF) project (Johnston et al., 2005b), the Drug Abuse Warning Network (SAMHSA, 2003a), and the Treatment Episode Data Set (SAMHSA, 2004d).

When investigating an emerging trend in drug use, such as the nonmedical use of prescription drugs, the most important epidemiological findings are likely to be those concerning the changes that take place over time. Important questions surveillance surveys ask likely are, “What drugs are rising or declining in popularity?” “How fast are these changes occurring?” and “What subgroups are most affected?” The answers to these questions have important implications for the efforts of health educators, prevention specialists, law enforcement, and public policy makers and deserve further attention.

Reports indicate that 13.7% of youth ages 12-17 have abused prescription drugs in their lifetime; 4.0% currently use prescription drugs, as indicated by use in the month

preceding a national survey (SAMHSA, 2004a). Each year close to half (44%) of new prescription drug abusers are under the age of 18 (SAMHSA, 2004a). When placed into perspective relative to other types of youth drug abuse, the prevalence of prescription abuse use ranks fourth, after alcohol, cigarettes, and marijuana respectively (Johnston et al., 2005b).

Controlled prescription drugs most likely to be used for their psychotherapeutic properties by young people include opioid pain relievers (i.e., opioids), stimulants and depressants. Anabolic-androgenic steroids such as Anabol or Equipose are also use nonmedically by young people, however primarily for purposes of body sculpting and athletic performance (NIDA, 2000). Although the medical community and public health agencies express concern for steroid abuse's adverse effects on health, especially among young people (NIDA, 2000), this study concentrates on the three classes of controlled psychotherapeutic drugs— opioid pain relievers, stimulants, and depressants— because they are the fastest growing categories of drugs used nonmedically for recreational purposes and have received relatively little research attention.

Initiation

The National Household Survey of Drug Use and Health shows that the initiation of nonmedical prescription drug use occurs primarily among persons age 12 to 25, and that new use has been increasing among young people (SAMHSA, 2004a). The annual number of new users of pain relievers has been rising since the mid-1980s, from about 400,000 initiates to 2.4 million in 2004. New users of stimulants increased from approximately 200,000 in 1991 to 793,000 in 2004 (SAMHSA, 2004a, 2003c). New users of tranquilizers have been increasing since the mid-1980s, but the largest increase has been recently, from more than 700,000 new users in 1999 to almost 1.2 million users

in 2004 (SAMHSA, 2004a, 2003c). The number of new users of sedatives remained around 100,000 per year between 1988 and 1994. Starting in 1995 however, the number rose from 111,000 to 240,000 in 2004 (SAMHSA, 2004a, 2003c). Between 1998 and 2004, there were more new users both opioids and stimulants among 12 to 17 year olds than among 18 to 25 year olds (SAMHSA, 2004a, 2003c).

Prevalence

Nonmedical use rates for each class of abusable prescription drugs have also generally increased each year during the past decade (Johnston et al., 2005b). Opioids, most commonly prescribed for pain relieving properties, have gained a great deal of attention in recent years because they are the most widely abused prescription medications; up to 70% of non-medical prescription drug users report abusing opioids. (SAMHSA, 2004a). From 1992 to 2000 annual prevalence of opioid abuse more than doubled among 12th graders (3.3% to 7.0%); non-medical opioid use continued to steadily increase until reaching peak levels in 2004 (9.5%). Specific drugs in this class including Vicodin, codeine, Percocet, and OxyContin are among the drugs most commonly mentioned by high school seniors in recent years (Johnston et al., 2005b).

In 2002, free-standing questions were included for two of those drugs in the Monitoring the Future Study—Vicodin and OxyContin— because of considerable public comment on the diversion of these medications. That year, both Vicodin and OxyContin attained surprisingly high prevalence rates, especially among 12th graders, suggesting that they very likely help to account for the upturn in the use of the general class of opioids. Annual prevalence in 2002 for Vicodin and OxyContin were 9.6% and 4.6%, respectively among 12th graders. In 2004, those rates shifted slightly, to 9.3% for Vicodin and 5.0% for OxyContin (Johnston et al., 2005b).

Stimulants (i.e., amphetamines) follow opioids with the next highest rates of nonmedical use. Since 1992, annual prevalence has veered upward, rising from 7% in 1992 to 10% in 1997, before peaking in 2002 (11%) among high-school seniors (Johnston et al., 2005b). Annual prevalence of amphetamines however, decreased to 10% in 2004. Ritalin has become the single most widely abused stimulant in recent years; its use increased among high school seniors from an annual prevalence of 0.1% in 1992 to 2.8% in 1998, and declined only slightly to 2.2% in 2000. This statistic rose significantly in 2004 to 3.9% (Johnston et al., 2005b). Because of increasing concern for Ritalin abuse, a newer stand-alone question was integrated into Monitoring the Future in 2001. While the newer question yielded somewhat higher absolute prevalence levels (believed to be a more accurate)—5.1% in 2001, 4.0% in 2002, and 2003, and 5.1% in 2004—researchers hold that the *trend* Johnston et al., 2005b).

Depressants are grouped into two subcategories: barbiturates (sedatives) and benzodiazepines (tranquilizers). Although barbiturates such as Seconal (secobarbital) and Nembutal (pentobarbital sodium) are still on the pharmaceutical market, benzodiazepines such as Valium (diazepam) and Xanax (alprazolam) are more widely prescribed than barbiturates and are therefore more available for abuse (Julien, 2001). Though barbiturates were widely used in the mid 1970s to mid 1980s, prevalence for the drug in this class declined dramatically in the early 1990s. By 1992, annual prevalence of use for 12th graders (2.8%) was less than one-third of the 1975 level (10.7%). Over the past decade, annual prevalence of tranquilizer use among 12th graders has been increasing steadily; from 2.8% in 1992 to 7.7% in 2002— about where it remains in 2004 (7.3%) (Johnston et al., 2005b).

Subgroup Trends

Gender. Most of the gender differences for abuse of individual classes of prescription drugs have remained fairly parallel in the past 30 years— that is, any trends in prevalence have remained stable with regard to gender (Johnston et al., 2005a). In general, adolescent males report higher rates of all types of drug use although there are some exceptions when it comes to prescription drugs. Females report slightly higher rates of amphetamine and tranquilizer abuse in the lower (8th and 10th) grades (Johnston et al., 2005a).

Geographic Region. The U.S. is frequently divided into four regions— Northeast, South, North Central, and West— for the purpose of monitoring geographic trends. In general, the "South", which spans as far west as Texas and as far north as Maryland has the lowest rates of use of any illicit drug use. Rates very somewhat with respect to the different classes of abusable prescription drugs. Prevalence is highest in the "West" for opioids when it is presented as a collective drug class, much of which is likely accounted for by the high rates of Vicodin use in that region. Amphetamine abuse is highest in the "South" and lowest in the "West." Greatest abuse of both sedatives and tranquilizers also takes place in the "South" (Johnston et al., 2005a)

Population Density. For the purpose of assessing differences in drug use according to population density, communities are classified into one of three strata— Large Metropolitan Statistical Areas (LMSAs) (i.e., the 16 largest population areas according to the 1990 census), Other MSAs (i.e., cities with a population larger than 50,000 but not classified as Large MSAs), and Non-MSAs (i.e., towns that do not have a population of at least 50,000). "Other MSAs" tend to have the highest and "Large MSAs" tend to have the lowest levels of any type of illicit drug use. This tendency

generally holds true for prescription drug abuse as with one exception; amphetamine abuse is highest among "Non-MSAs" (Johnston et al., 2005a).

Socioeconomic Status. When parental education is used as a proxy for socioeconomic status (SES), little systematic relationship exists for prescription drug abuse. However, it seems that a slight curvilinear relationship exists for opioids, amphetamines, and sedatives, with the highest and lowest SES groups being least susceptible to abuse. However, one exception is that in the lower grades, lowest SES groups report abuse of tranquilizers more than any other group (Johnston et al., 2005a).

Race/Ethnicity. While the three major racial/ethnic frequently groups cited— Whites, African Americans, and Hispanics— have different levels of use of some drugs, they have similar trends in almost all prescription drug classes. Abuse of opioids has consistently been highest among White students, considerable lower among Hispanics, and lowest among African Americans. In recent years, the rates have particularly increased among Whites. These data on general opioid use are reported only for 12th graders. Hispanics consistently fall in the middle for use of amphetamines, sedatives, tranquilizers as well with one exception. In the 8th grade, the Hispanics have the highest prevalence of amphetamine use (Johnston et al., 2005a).

Indicators of the Problem's Seriousness

In spite of public misperceptions that nonmedical use of prescription drugs is comparatively safer than illicit drug use, indicators of the problem's seriousness are reflected in high numbers of young people requiring prescription drug-related treatment and emergency health care (SAMHSA 2004b, 2003b). Drug-related morbidity and mortality affects more young people than the abuse of hallucinogens, methamphetamine, ecstasy, inhalants, and heroin combined (SAMHSA, 2003b). The Drug Abuse Warning

Network (DAWN), reports that anxiolytics and sedative hypnotics (i.e., depressants) are the most frequent psychotherapeutic agents motioned in drug related emergency department (ED) visits, representing 11% of total ED mentions (SAMHSA, 2003b). Closely following are the narcotic analgesics (i.e., opioids), comprising 10% of drug related mentions in ED visits. Prescription stimulants are mentioned in less than 2% of drug-related ED visits. Alcohol, marijuana, and cocaine are the only primary drugs of abuse mentioned in greater frequency than prescription drugs (SAMHSA, 2003b).

The dangers of prescription drug abuse are further exacerbated when more than one drug is present and are illustrated by the fact that three-quarters of all ED visits related to both prescription opioids and benzodiazepines (78%) involve more than one drug (SAMHSA 2004b, 2004c). The most frequent substances found in combination with both these drugs are alcohol, other opioid pain relievers, and cocaine (SAMHSA 2004b, 2004c). Approximately 30% of all DAWN emergency department cases involve patients aged 25 and under (SAMHSA, 2002).

In addition to ED visits, substance abuse treatment admissions further shed light on the problem. Prescription drugs were the primary substances of abuse for approximately 4% of the 1.9 million treatment admissions reported to the Treatment Episode Data Set (TEDS) in 2002 (SAMHSA, 2004d). More than half (55%) of those admissions were attributed opioids. Stimulants, tranquilizers, and sedatives comprised approximately 28%, 10%, and 6% of primary substances mentioned in treatment admissions, respectively. It is important to note that polydrug abuse is more common among treatment admissions than the abuse of a single substance. Prescription drugs are

also frequently mentioned as secondary or tertiary substances of abuse, thus further increasing their presence among treatment admissions (SAMHSA, 2004d).

The Youth Risk Behavior Survey

The Youth Risk Behavior Survey (YRBS) is a component of the Centers for Disease Control and Prevention's (CDC) Youth Risk Behavior Surveillance System (YRBSS). Additional components of the System include the National College Health Risk Behavior Survey (NCHRBS), the National Health Interview Survey (NHIS), a middle school version of the YRBS, and various special population surveys that have been conducted periodically (Brener et al., 2004).

The CDC initiated the design of the surveillance system in 1988 upon review of the leading causes of mortality among youths and young adults. Over 70 percent of adolescent mortality is due to preventable causes including motor vehicle crashes (32.3%), other unintentional injuries (11.7%), homicide (15.1%), and suicide (11.7%). Furthermore, substantial morbidity and social problems result from substance use, unintended pregnancies and sexually transmitted diseases, and risk factors for cardiovascular disease (Grunbaum et al., 2004). These behaviors are often established during youth, and extend into adulthood. In 1989, CDC took further steps to develop the instrument by convening a panel of experts to delineate priority behaviors and devise questions to measure those behaviors (Brener et al., 2004). Subsequent revisions led to the first and second nationwide administration of the YRBS in the spring of 1990 and 1991, respectively (Kann, Kolbe & Collins, 1993). However, it was soon determined that because behavioral change in populations typically occurs gradually, administrations of the survey every two years would be sufficient to assess health risk-behaviors among adolescents (Brener et al., 2004).

The YRBS therefore, has been administered biennially, in every odd year, since 1991 to measure the prevalence of six priority health risk behavior categories: (a) behaviors that contribute to unintentional injuries; (b) tobacco use; (c) alcohol and other drug use; (d) sexual behaviors that contribute to unintended pregnancy and sexually transmitted diseases; (e) unhealthy dietary behaviors; and (f) physical inactivity (Brener et al., 2004; Kann, Kolbe & Collins, 1993b). In focusing on these specific behaviors, relevant agencies are able to monitor the leading preventable causes of adolescent death, disability, and social problems to assess whether these behaviors increase, decrease, or remain the same over time, and examine the co-occurrence of health-risk behaviors. In addition, the YRBS provides a means to monitor relevant national health objectives, first for the year 2000 (Public Health Service, 1991), and now for the year 2010 (ODPHP, 2000).

The YRBS includes national, state, and local school-based surveys of high school students (Brener et al., 2004). The sampling frame for the most recent national YRBS consisted of all public and private schools with students in grades 9-12 in the 50 states and the District of Columbia. A three-stage cluster design was used to produce a nationally representative sample from public and private high schools (Grunbaum, et al., 2004). State and local administrations of the YRBS also rely on cluster sample designs to obtain representative samples of high school students in the participating jurisdictions (Grunbaum et al., 2004).

All students complete the YRBS during a regular class period (approximately 50 minutes) by recording their responses directly on a computer scannable questionnaire booklet or answer sheet. Student participation is voluntary and anonymous, yet

methodologies may vary slightly with respect to local parental consent procedures. Although the use of passive parental consent yields higher participation rates than active consent, type of parental consent generally does not affect prevalence estimates for risk of self-report behaviors on the YRBS (Eaton, Lowry, Brener, Grunbaum, & Kann, 2004). In addition to differing consent procedures, states and cities may modify the 87-item core questionnaire to meet individual needs under the conditions that they conserve at least two-thirds of the core questions from the standard YRBS; limit response options to eight mutually exclusive categories, and; do not use skip patterns or grid formats (Grunbaum et al., 2004; Brener et al., 2004). Refraining from the use of grids a skip patterns helps safeguard privacy because comparable amounts of time are required to complete the survey regardless of risk status (Brenner et al., 2002).

Because data from the YRBS are used to develop policies and prevent health risk behaviors among youth (Everett, Kann, & McReynolds, 1997), it is important that researchers have confidence that it contains reliable and valid measures for youth behaviors. Two CDC sponsored test-retest reliability studies have been conducted throughout the life of the surveillance system and in both cases, the survey was subsequently modified as a result (Brener et al., 2002; Brener, Collins, Kann, Warren, & Williams, 1995). The most recent test-retest reliability assessment of the survey was conducted in 2000 on a convenience sample of 4,619 high school students.

Results for the test-retest were reported in the form of kappa statistics and 95% confidence intervals. Kappa statistics, which provide a measure of agreement among items in the two administrations correcting for chance, revealed that nearly half (47.2%) of the items had at least “substantial” reliability (kappas ≥ 61%) and almost all (93.1%)

had at least "moderate" reliability (kappas ≥41%). Furthermore, based on nonoverlapping 95% confidence intervals, 22.2% of the items had significantly different prevalence estimates at Time 1 vs. Time 2. Examining reliability of the measures by behavior category revealed that items pertaining to certain behaviors elicited higher reliability than others. For example, items related to tobacco use, alcohol and other drug use, and sexual behavior demonstrated significantly higher reliability than items related to dietary behaviors, physical activity, and other health-related topics (e.g., ever been taught about HIV/AIDS in school, saw a dentist during past 12 months, rarely or never use sun screen, etc.).

Based on the 2000 test-retest, study items have been revised or deleted from subsequent versions of the YRBS. Specifically, 11 items have been modified or removed. These include items related to pregnancy and pregnancy prevention; the use of a helmet when riding a motorcycle; 30-day prevalence of heroin and inhalant use; most recent "check-up" visit to a health care provider (i.e., nurse, doctor, dentist); strength training; sources of cigarettes; providing proof of age when buying cigarettes; and frequency of wearing sunscreen (CDC, 2005, 1999). Since the 2000 test-retest study, seven items have also been added. These include items related to lifetime ecstasy use; seatbelt use in a car; having property stolen or damaged at school; being diagnosed with asthma and year prevalence of asthma attacks; a measure of total weekly physical activity; and a personal assessment of overall health (CDC, 1999; CDC 2005).

The 2005 YRBS consequently, is comprised of 87 items divided into twelve major sections. The first section contains standard demographic questions and the last section asks students about "other health topics" including asthma diagnosis and

HIV/AIDS education. The remaining health topics are divided across 10 behavioral areas: (1) personal safety; (2) violence; (3) sadness, suicide ideation, and attempts; (4) alcohol use; (5) marijuana use; (6) cocaine and other drug use; (7) sexual behaviors; (8) body weight; (9) dietary behaviors; and (10) physical activity (CDC, 2005).

Although reliability is a necessary characteristic of a valid measure, demonstration of the YRBS' reliability does not ensure validity. The truthfulness and accuracy of self-report questionnaires like the YRBS may be compromised because health-risk behaviors are often difficult to recall and some are so sensitive that respondents may not feel comfortable reporting them (Brener, Billy, & Grady, 2003). Specifically, validity allows researchers to answer to pivotal question, "Can we trust the data from this questionnaire?"

Despite the importance of establishing validity, no study has validated all self-report behaviors included on the YRBS. CDC has discussed difficulties in executing that task given the lack of objective measures for many behaviors of interest (Brener et al., 2003). In fact, validation of specific YRBS items has been limited to two studies. A small study by McDermott and colleagues verified that YRBS questions related to alcohol are valid measures of youth drinking behavior (McDermott, Sarvela, Caravella, & Gast, 1995). However another study conducted by CDC to assess the validity of height and weight measures, demonstrated that students tend to over-report height and underreport weight, leading to underestimations of overweight (Brener et al., 2003). In spite of the relative absence of validity estimates of YRBS self-report measures, CDC officials maintain YRBS items likely accurately assess many youth-risk behaviors, especially those related to drug, alcohol, and tobacco use. This belief is based on studies

of measures similar to YRBS items that have demonstrated validity of self-reported alcohol and other drug use, tobacco use, suicidal ideation, sexual behavior, dietary behaviors, and physical activity (Brener et al., 2002).

Correlates of Adolescent Prescription Drug Abuse

A substantial body of evidence suggests that adolescent risk behaviors do not occur in isolation, but rather, cluster in vulnerable individuals (Bell & Bell, 1993; Donohew, Palmgreen, Zimmerman, Harrington, & Lane, 2003; Dryfoos, 1990; Jessor et al., 1991). Also, over time, involvement in one type of risk behavior increases the likelihood of becoming involved in other risk behaviors (Osgood, Johnston, O'Malley, & Bachman, 1988). Singly, any risk behavior and its associated health outcomes can represent a serious threat to an adolescent's health. However the tendency for risk behaviors to cluster, or *covary*, further exacerbates the health threat.

Studies of nonmedical prescription drug use in adolescents suggest that prevalence is not only associated with other substance abusing behaviors, but is also correlated with an array of academic and personal problems, and selected problem behaviors (Boyd et al., 2006; McCabe & Boyd et al., 2005). Although limited data exist on the health-risk correlates of prescription drug abuse, the literature is beset with studies indicating that substance abuse is associated with multiple risk-taking behaviors in adolescents (Bell & Bell; 1993; DiClemente et al., 1996). Because prescription drug abuse is a subset of drug abuse, many of these correlates may also have particular relevance to prescription drug abuse.

Tobacco Use

The onset and development of cigarette smoking and tobacco use usually occurs in adolescence (Kopstein, 2001). Tobacco use deserves special attention because it is

highly addictive and remains the chief preventable cause of death in the U.S. (U.S. Department of Health and Human Services [U.S. DHHS], 2004). It can not only lead to negative short term effects in youth but also has long-term implications for adults, especially for those who initiate tobacco use at young ages (Perry & Stufacker, 1996). Smoking during childhood and adolescence appears to increase the risk for developing chronic obstructive pulmonary disease; acute respiratory illness; heart disease; and stroke; and can lead to several types of cancers including those of the lung, larynx, oral cavity, pharynx, pancreas, and cervix (U.S. DHHS, 2004).

Recent research on a nationally representative sample of adolescents found that high school seniors who used abused prescription opioids were approximately seven times more likely to have smoked cigarettes in their lifetime as compared to non users. OxyContin users in particular, were almost nine times more likely to have smoked cigarettes in the past 30 days (McCabe & Boyd et al., 2005). Smoking has also been correlated with stimulant abuse. In a secondary analysis of national data, McCabe, Teter, Boyd, & Guthrie (2004) found that illicit methylphenidate (Ritalin) users in grades 8, 10, and 12, were significantly more likely than non-users to report cigarette smoking in the past month (64% vs. 18%). McCabe, Teter, and Boyd (2004), found similar results from a survey conducted on 1,536 students in a Midwestern school district where one in every two illicit stimulant users reported cigarette smoking as opposed to less than 10% among non-stimulant users or prescribed stimulant users. Although no studies report the correlation between tobacco and prescription depression abuse in adolescents, a secondary analysis of the Harvard School of Public Health College data suggests tobacco use is a correlate of nonmedical prescription benzodiazepine (e.g., Xanax, Valium) use

among college undergraduates. It is important to note that a strong dose dependent relationship between tobacco use and multiple substance use behaviors has also been found among a national sample of adolescents (Everett et al., 1998).

Alcohol Use and Binge Drinking

Alcohol use remains extremely widespread among young people. The majority of adolescents (77%) have consumed alcohol by the end of high school and more than half (60%) of 12th graders report having been drunk at least once in their life (Johnston et al., 2005b). High levels of adolescent alcohol use have been associated with the three most frequent forms of mortality among adolescents, that is, accidental deaths (especially automobile accidents), homicides, and suicides (Mokdad, Marks, Stroup, & Gerberding, 2004). Higher levels of adolescent alcohol use are also associated with increased risk of contracting HIV and other sexually transmitted diseases, teenage pregnancy, poor school performance, and school dropout (Windle, Shope, & Bukstein, 1996).

According to national surveillance data, teens who admit to abusing controlled prescription drugs are twice as likely to have used alcohol (SAMHSA, 2004a). High school seniors who nonmedically use opioids (specifically Vicodin and OxyContin), are over six times more likely to report alcohol use in the past month and heavy episodic drinking in the past two weeks (McCabe & Boyd et al., 2005). Among a national sample of 8th, 10th, and 12th grade students, those who abused prescription stimulants (i.e., Ritalin) were significantly more likely to report heavy episodic drinking than non-abusing students (61% vs. 20%). Although no study reports the relationship between adolescent depressant and alcohol use, a nationwide study of undergraduate students illustrated that nonmedical tranquilizer use (e.g., Valium, Librium, Xanax, Ativan,

Klonopin) significantly increased students' odds of frequent binge drinking by four times (McCabe, 2005).

Marijuana Use

Among the illicit drugs, use of marijuana is the most prevalent (Johnston et al., 2005b). Among adolescents who use drugs, approximately 60% use only marijuana (SAMHSA, 2004a). Marijuana shares with tobacco, smoking as the usual route of administration, and as a result, may lead to many of the same adverse affects to the respiratory and cardiovascular systems (Sidney, Beck, Tekawa, Quesenberry, & Friedman, 1997). Research has shown that cannabis can produce a subtle impairment of attention, memory, and the organization and integration of complex information. Prolonged use may even lead to changes in the brain permanently affecting learning and mood (Block & Ghoneim, 1993).

Results from the National Household Survey on Drug Use and Health suggest that teens who abuse prescription drugs are five times more likely to use marijuana (SAMHSA, 2004a). When broken down into specific drug class, adolescents age 10-18 who abuse opioids are approximately six times more likely to engage in past months marijuana use. High school seniors who abuse the specific opioids Vicodin and OxyContin are 10 and 14 times more likely to engage in past year marijuana use, respectively. Students using the prescription stimulant Ritalin report much higher rates of marijuana use (80% vs. 25%) than those who do not abuse the stimulant drug. (McCabe, Teter, Boyd, & Guthrie, 2004).

Other Illicit Drug Use

Illicit drug use is greater among youth in the U.S. than has been documented in any other developed country in the world (Blanken, 1993). To name some of the more

prominent consequences, illicit drug use is associated with suicide, homicide, motor-vehicle injury, transmission of sexually transmitted diseases including HIV infection, pneumonia, unwanted pregnancy, delinquency, violence, mental illness, and hepatitis (Mokdad et al., 2004; SAMHSA, 2004a). Although national trends suggest illicit drug use is decreasing in the U.S., substance use is nonetheless a problem with serious health and legal implications.

Each class of illicit drugs has unique health implications. *Cocaine* for example, acts as a stimulant and short-term effects can include excitability; increased temperature and blood pressure; erratic behaviors; paranoia; and in large doses, heart failure. Long-term use of cocaine can lead to psychosis, mood swings, weight loss, and insomnia. (NIDA, 1999). As an opiate, *heroin*, has sedative effects, thus slowing vital functions such as higher brain activity, breathing and heart rate and may lead to death. Other heroin-related health risks include infection, associated with syringe use (NIDA, 2005a). *Ecstasy*, a hallucinogenic stimulant, emerged as a popular drug among youth during the mid to late 1990s. Many of the side effects users encounter with ecstasy are similar to those found with cocaine. However, a major risk to health from taking ecstasy is hyperthermia, or heatstroke, leading to cardiac failure (NIDA, 2004a). Though not necessarily illicit drugs, *inhalants* including solvents, aerosols, and nitrates, are sometimes used illicitly to get high. This type of substance use is often seen among younger students because inhalants are readily available and relatively inexpensive (NIDA, 2005b). Nonetheless, inhalants can cause bronchitis, skin problems, memory impairment vital organ damage, asphyxiation, and are potentially lethal (NIDA, 2005b). *Steroids* represent another class of substances that are potentially abused by adolescents

and should be mentioned. Unlike the other illicit drugs, steroids are not used for their psychoactive properties but rather, for their body building and sculpting potential. Consequences of steroid use in adolescence include severe acne, mood disruptions, and can interfere with growth through growth halted prematurely through premature skeletal maturation and accelerated puberty changes (NIDA, 2000).

The literature frequently describes "polydrug abuse" or "polysubstance abuse" when referring to populations who concurrently use multiple substances whether licit or illicit (Rosenthal & Levounis, 2005). Polydrug use can be dangerous due to a whole host of effects that can occur by combining drugs in ways that are not physician approved—putting them at risk for adverse interactions and overdose (NIDA, 2001b). In addition, successful treatment of polydrug abuse may be difficult, as treatment programs may not be designed to effectively address multiple drugs (SAMHSA, 2004a) Adolescent users are a subgroup who have been identified as high risk for polysubstance use and compared to older groups, younger users in treatment settings are more likely to report multiple drugs (SAMHSA, 2004a). Among teens ages 12 to 17, 79.8% of prescription drug abusers are polysubstance abusers. National data also indicate that adolescents who abuse prescription drugs are at risk for "hard" illicit drug use at a much higher rate than they are for marijuana use when compared to adolescents who do not abuse such drugs. They are 12 times more likely to use heroin, 15 times more likely to use ecstasy, and 21 times more likely to use cocaine (SAMHSA, 2004a).

Correlations between abuse of the three specific classes of prescription drugs and selected illicit drug have been made among young people. For example, middle and high school students who abuse methylphenidate, a prescription stimulant, are significantly

more likely than nonabusing students (43.2% vs. 1.5%) to use ecstasy, another potent yet illicit stimulant drug (McCabe, Teter, & Boyd, 2004). Prescription pain medications have also been correlated with illicit drug use other than marijuana among adolescents. In a Detroit-area public school district, in fact, students who used opioids nonmedically experienced a nine-fold increased risk of illicit drug use (i.e., cocaine, inhalants, ecstasy, inhalants, and psychedelics including LSD) (Boyd et al., 2006). Young people who abuse prescription depressants including Xanax, Librium, and Valium also use illicit drugs at increased rates. Specifically, nonmedical use of depressants increases the tendency for college students to also use cocaine and ecstasy by 14 and 16 times, respectively (McCabe, 2005). Although the use of heroin, steroids, and inhalants has not been reported in studies correlating prescription drug abuse with illicit drug abuse, the literature suggests that one type of drug abuse increases an adolescent's risk for another (Abdel-Ghany, & Wang, 2003; Bukstein, 1995); therefore, implying that use of these types of drugs may also be exacerbated by prescription drug use.

Driving Under the Influence of Alcohol

Motor vehicle crashes are the leading cause of death for U.S. teenagers, accounting for nearly 40% of fatalities (National Center for Injury Prevention and Control [NCIPC], 2005). Traffic crashes are more likely to result in death or injury if alcohol is involved (i.e., those in which the driver or pedestrian had a blood alcohol concentration (BAC) above zero). According to the National Highway Traffic Safety Administration (2003), 41% of people fatally injured in traffic crashes were in alcohol related crashes and 35% were crashes involving someone with a BAC of 0.08% or higher. Although 14% of drivers in alcohol-related fatal crashes are between the ages of

16 and 20, this age group represents only 7% of the population, thus suggesting that young people are at particular risk (Hingson & Winter, 2003).

The nonmedical use of prescription drugs among adolescents and young adults has been shown to significantly increase risk of driving under the influence and riding with an intoxicated driver (McCabe, 2005; McCabe, Teter, & Boyd, 2004; McCabe, Teter, Boyd, Knight, & Wechsler, 2005). For example, among high school students who partake in the nonmedical use of prescription stimulants, 66.7% report riding with a driver who has had at least one drink and 44.4% report riding with an intoxicated driver. These rates are both significantly higher than rates in the non-abusing population (McCabe, Teter, & Boyd, 2004). Although studies have not correlated the abuse of the other two readily abused classes of prescription drugs—depressants and opioids—with driving under the influence among adolescents, correlations have been made among college undergraduate students. Young adults who abuse prescription benzodiazepines or opioids are approximately four times more likely to report driving a car after binge drinking and almost six times more likely to report being a passenger with a drunk driver (McCabe, 2005; McCabe, Teter, Boyd & Knight et al., 2005).

Violence Related Behaviors

CDC's YRBS includes acts such as physical fighting, carrying weapons to school, feeling unsafe or threatened at school, school thefts, and forced sexual intercourse in its definition of violence-related behaviors (CDC, 2005). Although most violent behavior produces relatively minor injuries, long-term disability and death are also frequent consequences, especially when a weapon is present. Approximately 90% of homicide victims in the U.S. are killed with a weapon, that is, a gun, knife, or club (Anderson et al., 2001). Homicide is the second leading cause of death among all adolescents and it is the

leading cause of death among Black youth aged 15-19 (NCIPC, 2005). Forced sexual intercourse is also an important problem in adolescence, as it has also been associated with poorer physical and mental health among women (Brener, McMahon, Warren, & Douglas, 1999).

The association between violence and alcohol and drug use is well established. A large scale study in a Texas school district assessed the co-occurrence of youth's violent behavior and engagement in other risk behaviors including substance use using the YRBS (Orpinas et al., 1995). Although prevalence of fighting and weapon carrying vary greatly by gender (males engage significantly more in both), associations were demonstrated between fighting and carrying a weapon, and heavy alcohol, tobacco, and other drug use among both boys and girls. Highest correlations however, were found between frequency of weapon carrying and frequency of drinking alcohol and being inebriated (Orpinas et al., 1995). In another regional study of correlates of adolescent violent and aggressive behaviors, alcohol was significantly associated with fighting among White female, while binge drinking with fighting among White males only (Valois et al., 1995). Significant relationships were also found for illicit drug use (i.e., marijuana, cocaine, intravenous drug use) among Whites but not among Blacks. For carrying a weapon, the strongest predictors also included illegal drug use among Whites but not among Blacks (Valois et al., 1995).

Youth exposure to violence and victimization through indirect means has also been shown to relate to adolescent drug use. In addition to being the victim or perpetrator of a violent act, students who have knowledge of violence (i.e., know victims of violence) or witness violence have higher a tendency for substance abuse (Albus,

Weist, & Perez-Smith, 2004). Forced sexual intercourse, is a topic largely neglected in the literature. However, Howard & Wang (2005) recently demonstrated that substance use behaviors including smoking, binge drinking, cocaine and inhalant use, and drinking or using drug before sex are related to being forced to have sex. Although more pronounced for females, the relationships also exists among males (Howard & Wang, 2005).

Sexual Experience and Risk Taking

Younger age at first intercourse and greater numbers of sexual partners are associated with increased risk for unwanted pregnancy and sexually transmitted infections (STIs) including HIV (Abma & Sonenstein, 2001). Research shows that pregnancy often limits the educational achievements and vocational opportunities among adolescents, especially for females, thus leading to social and economic problems (Stevens-Simon & McNarney, 1996). One of the most immediate and significant risks to the health of adolescents is acquiring a sexually transmitted infection. From an economic and social standpoint, these infections take a large toll on adolescents and ultimately society. In terms of health outcomes, sexually transmitted infections can be potentially devastating. The potential impact of STIs is incredibly significant for example, in the case of HIV infection, which can ultimately result in fatal illness, AIDS.

Studies using the YRBS to assess the correlates of sexual risk taking have focused on sexual experience (Shrier & Crosby, 2003); condom use (Richter, Valois, McKeown, & Vincent, 1992; Shrier et al., 1996); early initiation of sexual intercourse, (Coker et al., 1994); multiple HIV virus-related sexual behaviors (Lowry et al., 1994); number of sexual intercourse partners (Valois et al.,1999; Shrier et al., 1996) or have employed composite scores of the various behaviors.

In each of these studies, substance use was significantly associated with one or more measures of sexual risk taking. Lowry et al. (1994) for example, found that students who reported no substance use, were least likely to report having had sexual intercourse, having had four or more sex partners, and not having used a condom at last sexual intercourse. Furthermore, sexual risk behaviors were greatest among students who had used marijuana, cocaine, or other illicit drugs. Students who only used alcohol or cigarettes had smaller but still significant increases in the likelihood of HIV-related behaviors (Lowry et al., 1994). Studies have further confirmed the significant association between drug use (i.e., alcohol, tobacco, and marijuana use) and increased number of sexual partners in assessing a cluster of risk behaviors placing adolescents at risk for unintended pregnancy, HIV, and other sexually transmitted infections (Shrier et al., 1996; Valois et al., 1999).

Among alternative high school students similar results have also been found. Shrier & Crosby (2003) found that sexually experienced students in alternative schools were close to 50% more likely to engage in cocaine, inhalant, and needle use, and almost three times as likely to use alcohol and marijuana than their sexually abstinent counterparts, though they did not show higher rates of tobacco use. This may be attributed to the fact that smoking is twice as prevalent among youth in alternative schools and it may have been difficult to detect small differences in smoking between sexually experienced and abstinent youth in this study (Shrier & Crosby, 2003).

Depression and Suicide Ideation

The relationship between depression and sadness and suicide attempts is well established (Wulsin, Vaillant, & Wells, 1999). Empirical studies have indicated that major depression is most highly correlated with suicide for girls (increasing risk 20-fold)

followed by a previous suicide attempt. Among boys, a previous attempt is the most highly correlated factor (increasing risk 30-fold) followed by depression, alcohol, or drug use, and disruptive behavior (Lewinsohn, Rohde, & Seeley, 1996). Fortunately, only a fraction of youth who have attempted suicide are successful; less than one in 50 suicide attempts result in death (Cohen, Spirito, & Brown, 1996). Nonetheless, suicide remains the third leading cause of death among adolescents (NCIPC, 2005) and studies identifying risk factors warrant further attention.

Although a number of different correlates or predictors of suicidal thoughts, plans, and attempts have been addressed in the literature, drug use has perhaps, received the most attention (Crumley, 1990; Garrison et al., 1993; Hallfors et al., 2004). In a study of South Carolina youth, Garrison et al. (1993) confirm that illicit drug use is a highly influential factor for suicidal thoughts, plans, and attempts, second only to female gender. When broken down into specific drugs, the largest effects for suicide attempts are seen for "harder drugs", that is, cocaine use, other drug use (i.e., LSD, PCP, ecstasy, mushrooms, speed, heroin) and intravenous drugs although alcohol use and marijuana also increase risk (Garrison et al., 1993). Data from the National Longitudinal Study of Adolescent Health (Add Health) further illustrate that clusters of students who engage in illegal drug use (including marijuana, and other drug use) had highest odds of depression, suicidal ideation, and suicide attempts (Hallfors et al., 2004).

Decreased Physical Activity

The benefits of physical activity have been well documented. Participation in regular physical activity helps control weight, strengthen bones, build lean muscle, and reduce body fat content. Exercise also reduces feelings of depression and anxiety, and promoting psychological well-being (U.S. DHHS, 1996). Over time, regular physical

activity decreases the risk of premature death and disability from causes including heart disease, high blood pressure, diabetes, and certain cancers (U.S. DHHS, 1996). Despite the benefits of exercise, high school students, particularly girls, generally do not participate in sufficient levels of vigorous physical activity (Grunbaum et al., 2004).

Though no empirical studies have examined the association between prescription drug abuse and physical activity in adolescents, research has shown significant relationships among physical activity levels and other drug abuse behaviors including those involving tobacco and marijuana (Pate et al., 1996; Winnail et al., 1995). In comparing physically inactive (reporting fewer tan 2 days a week of light exercise) with highly active adolescents (reporting 6 or more days exercise) Pate et al., (1996) found that physical activity level was inversely related to cigarette and marijuana use but not alcohol use. In fact, students who consumed one or more alcoholic beverages in the past month were more likely to be in the high activity group (Pate et al., 1996).

In a similar study, Winnail et al. (1995) grouped a physical activity variable on the South Carolina YRBS into three levels—"lower," "moderate," and "higher" to find that higher level of physical activity served as a protective factor for White males in the use of cigarettes, smokeless tobacco, and marijuana. The relationship however, did not hold for Blacks or females. Although the study suggested a relationship among White males, it was not based on a nationally representative sample, and results should therefore be interpreted with caution. Evidence suggests that as adolescents age, not only do their levels of physical activity decline but their substance use tends to increase (Grunbaum et al., 2004). However, given the relative absence of studies examining the covariation of

physical activity and drug use and the mixed results of the studies that have been conducted, it is apparent that further research needs to be conducted on the topic.

Use of Problem Weight Loss Practices

Studies have shown high rates of body dissatisfaction and dieting among adolescents. This is especially pronounced among females, many of which engage in unhealthy weight control behaviors such as fasting and self-induced vomiting. (Neumark-Sztainer & Hannan, 2000). It is estimated that up to 8% of females in the U.S. suffer from anorexia nervosa and/or bulimia during their lifetime (APA, 2004). Both these disorders are associated with high rates of comorbidity. Extreme dieting and disordered eating behaviors among youth are of concern in that they have the potential to adversely affect nutrient intake, mental health status, and long-term health outcomes such as osteoporosis (Neumark-Sztainer & Hannan, 2000).

Although problem weight loss tactics items on the YRBS can not be used to define eating disorders, they help assess behaviors that are potentially problematic.

Although prescription stimulants are now rarely prescribed to treat obesity and overweight, it is widely known that these drugs prevent weight gain. Studies correlating problem weight loss practices with drug use have confirmed that adolescents who are willing to engage in unhealthy weight loss behaviors such as restricting and purging, are also likely to use prescription stimulants to lose weight. In a study of 854 adolescent girls and young women age 12 through 23, 9.5% reported using stimulant drugs to control their weight. Many of those same females also reported dieting, fasting, and vomiting for weight control (Moore, 1988). A recent study on 101 female adolescents clinically diagnosed with an eating disorder (i.e., meeting DSM-IV criteria) found that both anorexic and bulimic patients were significantly more likely to abuse stimulant

drugs than those young women in a comparison group (Stock, Goldberg, Corbett, & Katzman, 2002). It is also important to note that several studies of high school populations, including those using the YRBS, have demonstrated an association with problem weight loss tactics and the use of cigarettes, alcohol, or marijuana, suggesting that they may cluster with substance abuse behaviors (Neumark-Sztainer et al., 1998; Rafroiu et al., 2003).

The relationship among adolescent drug use and various health risk behaviors demonstrates the importance of developing a deeper understanding of prescription drug abuse exposure and involvement within the broader context of risk. These associations provide compelling support that the abuse of prescription drugs may represent a part of the pattern of polydrug abuse and a larger cluster of problem behaviors.

CHAPTER 3
MATERIALS AND METHODS

In this study, I examined the relationship between non-medical prescription drug use and other risk behaviors among adolescents using a modified version of the 2005 Youth Risk Behavior Survey referred to hereafter as the Santa Rosa County Health Behavior Survey (SRCHBS). In this chapter, the methods that I used to conduct the research project are described. A description of the research design, research variables, population, instrumentation, data collection procedures, and data analyses are presented.

Research Design

According to Creswell, research designs "are the specific procedures involved in the last three steps of the research process: data collection, data analysis, and report writing" (p. 51). Specifically, research designs allow investigators to answer our research questions (Cottrell & McKenzie, 2005). A study's design is therefore important in determining whether one's findings are scientifically sound.

This study employed a correlational research design using specific survey measures for data collection. Cottrell and McKenzie (2005) describe correlational research as "non-experimental research that examines relationships between or among variables" (p. 7). In utilizing a correlational design, the researcher must be careful to refrain from concluding a cause and effect relationship between factors. Causal relationships can only be established by using experimental design (Cottrell & McKenzie, 2005).

A correlational study assumes that the researcher can first describe (by measuring or observing) each of the variables she is trying to relate (Trochim, 2001). The most widely used method to collect descriptive and behavioral data in health education is the survey research design. According to Alreck and Settle (2004), a survey is "a research technique where information requirements are specified, a population is identified, a sample is selected and systematically questioned, and the results analyzed, generalized to the population, and reported to meet the information needs" (p. 449). A survey's value depends on both the amount of resources devoted to it and the care and expertise that goes into the work. Surveys frequently take the form of questionnaires (e.g., paper-and-pencil, electronic) or interviews (e.g., one-on-one, focus group, telephone) (Alreck & Settle, 2004).

The myriad strengths of survey research explain why this method is so popular among social scientists. As cited earlier, surveys can be administered through several media and can be tailored to measure a wide range of characteristics from a sample. In addition, surveys employ a standardized method of data collection and can be designed to collect a large amount of information in a relatively short period of time (McDermott & Sarvela, 1999).

Despite the usefulness of this type of research, survey methods also have some disadvantages. One limitation of surveys is the potential of a low response rate, as only those respondents who are accessible and motivated to complete the survey can become sources of data. This is especially true for self-administered surveys, where the investigator is not present to motivate the respondent or clarify any sources of confusion (McDermott & Sarvela, 1999). Surveys are also limited in that they depend on direct

responses from the study sample. If sensitive items are included in a survey, respondents may skip these items because they feel embarrassed or threatened by them or may tend to over- or under-report behaviors (Alreck & Settle, 2004). Other disadvantages of survey research include lack of a comparison group and absence of a pre-test for assessing change scores (Aday, 1997).

This study used a cross-sectional group-administered census survey. Using a version of the 2005 Youth Risk Behavior Survey (YRBS) that was modified to include items on prescription drug abuse, I assessed health behaviors of 12th grade students from two senior high schools in Northwest Florida. *Cross sectional* denotes that data collection took place at a single point in time (Cottrell & McKenzie, 2005). A *census* attempts to acquire data from each member of a population and was appropriate for this study because the known population of interest was "relatively small and readily accessible" (Gay, 1996, p. 252). The survey was administered in the group setting of the schools' respective cafeterias during an assembly for convenience by the researcher.

Research Variables

When conducting correlational studies, researchers sometimes refrain from using the terms *independent variable* and *dependent variable*. They may instead refer to the correlation of two *variables*, in keeping with the principle that correlations measure relationships among variables rather than measure the extent to which the independent variable influences the dependent variable (Creswell, 2005). For this study however, I have defined dependent and independent variables. The dependent variable was non-medical prescription drug use, measured by the prescription drug items in the SRCHBS. The dependent variable was measured using a composite score of prevalence items that correspond to the three major classes of abusable prescription drugs: opioid pain

relievers, central nervous system stimulants, and central nervous system depressants. The composite score was then dichotomized to indicate whether a student has or has not used prescription drugs non-medically.

The study's independent variables included tobacco, alcohol, and marijuana use; other illicit drug use including cocaine/crack, inhalants, heroin, methamphetamines, ecstasy, or heroin; violence-related behaviors; sadness, suicide ideation and attempts; sexual risk taking, and the use of problem weight loss tactics. These independent variables were measured by using the corresponding items found in the 2005 YRBS. The independent variables were selected because they have each been correlated with adolescent substance abuse behaviors in previous research (DiClemente et al., 1996).

Study Population

Sampling involves selecting individuals from a population in a way that generalizes results to the population from which the units were chosen (Trochim, 2001). Researchers often enlist sampling methods to determine how specific study participants will be selected. The alternative to sampling is enumeration (also referred to as a census), that is, counting the entire population (Alreck & Settle, 2004). A researcher's ability to conduct a census depends upon the number of potential participants, researcher accessibility to participants, and data collection resources (Cottrell & Mckenzie, 2005).

Because the numbers of 12th graders in the two public high schools selected for the study were relatively small and readily accessible, a census was employed. Therefore, the population for this study included all 12th grade students enrolled in two high schools in Santa Rosa County in Northwest Florida during the spring of 2006. Santa Rosa County is home to six public senior high schools ranging in approximate size from 295 to 1850 students. The first school had a student body of approximately 1650

students, 387 of which were seniors. The second school had approximately 1600 students, 340 of which were seniors. Thus, the study population included 727 senior high 12th graders. Students who attended the senior student assemblies at the two schools on May 1, 2006, who received parental permission, and who volunteered to complete the group-administered, paper-pencil questionnaire served as the study participants.

Instrumentation

I collected data using a modified version of the 2005 YRBS. The YRBS is part of the Youth Risk Behavior Surveillance System administered by the CDC. The 2005 YRBS contains 87 items designed to monitor six categories of priority health behaviors among youth— (1) behaviors that contribute to unintentional injuries and violence, (2) tobacco use, (3) alcohol and other drug use, (4) sexual behaviors that contribute to unintended pregnancy and sexually transmitted diseases, (5) unhealthy dietary behaviors, and (6) physical inactivity (CDC, 2005). The YRBS has been conducted biennially (in odd numbered years) since 1991, on representative samples of U.S. students in grades 9-12 (Kann, Kolbe, & Collins, 1993; Brener & Kann, et al., 2004).

Reliability measures the "extent to which an instrument's measurement is consistent, dependable, and stable" (McDermott & Sarvela, 1999, p. 346). In 2000, CDC conducted a test-retest reliability study of the questionnaire (Brenner et al., 2002). In that study, the 1999 version of the questionnaire was administered to a convenience sample of high school students on two occasions, approximately two weeks apart. Approximately one of five items had significantly difference prevalence estimates for the first and second administrations. The CDC used Kappa coefficients, a widely used method for testing whether agreement on the first and second administration exceeds chance levels. Kappa coefficient determination is a "straightforward approach to calculate simple

agreement" on two observations (Streiner & Norman, 1995, p. 116). Ten items (14%) had both kappas <61% and significantly different time-1 and time-2 prevalence estimates, indicating that the reliability of these items is questionable. Based on the 2000 reliability study, certain items have been revised or deleted from subsequent versions of the questionnaire (Brenner et al., 2002).

Validity is the "degree to which an instrument measures what it purports to measure" (Cottrell & McKenzie, p. 143). Although no study has been conducted to assess the validity of all self-reported behaviors that are included in the YRBS, in 2003 CDC conducted a review of existing empirical literature to assess cognitive and situational factors that might affect the validity of adolescent self-reporting of behaviors measured by the questionnaire. Brener et al. (2003) discussed difficulties in determining validity of self-report data. However, CDC had determined that for the most part, behaviors are reported accurately, especially when they measure substance use (Brener et al., 2003).

The 2005 YRBS was modified by first excluding three supplemental items regarding HIV/AIDS prevention and asthma, and two items regarding height and weight. These items did not concern variables of interest for the study. Items which were added included one demographic item regarding school site and 19 items regarding prescription drug abuse. Eighteen of the prescription drug items (six each representing the three drug classes of interest) largely paralleled the behavior anchors and response options of the items in the YRBS that are designed to monitor marijuana use. The other measured prescription drug abuse as a weight loss tactic. Instructions for the completion of the newly added items were also written. Thus, the final questionnaire contained 102 items (see Appendix A).

Item Development

The 19 items assessing non-medical prescription drug use were designed by (a) reviewing literature via database searches (e.g., PubMed, PsycInfo) regarding prescription drug use and abuse in adolescents, (b) reviewing existing prescription drug use and abuse-related items on questionnaires appropriate for adolescents, (c) reviewing the general drug abuse-related items on the 2005 YRBS, and (e) asking an expert panel to critique the new items using specified guidelines.

For my study, I modified an existing instrument and therefore had to first assess validity of any new items I incorporated. The validity of a survey reflects the degree to which items are free from both random error and systematic bias (Alreck & Settle, 2004). Validity is differentiated into three types: content, construct, and criterion. Content validity is generally considered a prerequisite for other forms of validity (e.g., construct, criterion-related, etc.) and is especially important for measures of social behaviors (McDermott & Sarvela, 1999). Content validity of survey items "relies on judgments about whether the questions chosen are representative of the concepts they are intended to reflect" (Aday, 1997, p. 57). The use of assessments that lack content validity can lead to invalid conclusions as well as the misapplications of findings (Vogt, King, & King, 2004).

According to Aday (1997), a researcher can ensure a reasonable amount of validity by first reviewing questions or variables on the same topic that have been used in other studies. Specifically, I referred to items found in the 2004 Monitoring the Future Study (Johnston et al., 2005b) and the 2004 National Survey on Household Drug Use and Health (Research Triangle Institute, 2003) because they are both considered reliable and

valid measures of drug use, and are administered at the national level annually (Cowan, 2001).

Based upon my review of the literature and existing questionnaire items, I initially constructed 12 items and corresponding instructions for completion in a format analogous to those monitoring marijuana use on the 2005 YRBS. Each major class of abusable prescription drugs was represented by four parallel items for the purpose of consistency across the measures. Specifically, the questions addressed lifetime prevalence; age at first use; 30 day prevalence; and 30 day prevalence on school property. Figure 1 provides the instructions and the four items regarding prescription pain relievers presented to the expert panel in the form of a text document that accompanied the Web-based review form. Parallel items were also constructed for CNS depressants and stimulants.

Section A: Prescription Pain Relievers

The next 4 questions are about pain relievers, which doctors sometimes prescribe after surgery or when someone is in a lot of pain. People are only supposed to take prescription pain relievers if they have a prescription from a doctor for them. Prescription pain relievers are sometimes called *Pain pills, Oxies, Percs, Hillbilly heroin, or Demmies.* They include drugs such as: Vicodin, OxyContin, Percocet, Percodan, Codeine (Tylenol 3 & 4), Darvon, Demerol, Dilaudid, Morphine, Methadone. In the answers you provide, we are only interested in your use of prescription pain relievers if the drug was NOT prescribed to you or you took the drug only for the experience or feeling if caused. We are not interested in your use of "over-the-counter" pain relievers such as aspirin, Tylenol, or Advil that can be bought in drug stores or grocery stores without a doctor's prescription.

1. During your life, how many times have you used a prescription pain reliever that was not prescribed to you or you took only for the feeling it caused?
   A. 0 times
   B. 1 or 2 times
   C. 3 to 9 times
   D. 10 to 19 times
   E. 20 to 39 times
   F. 40 to 99 times
   G. 100 or more times

2. How old were you when you first tried a prescription pain reliever not prescribed to you or you took only for the feeling it caused?
   A. I have never used a prescription pain reliever in a way not prescribed for me by a doctor.
   B. 8 years old or younger
   C. 9 or 10 years old
   D. 11 or 12 years old
   E. 13 or 14 years old
   F. 15 or 16 years old
   G. 17 years old or older

3. During the past 30 days, how many times did you use a prescription pain reliever that was not prescribed to you or you took only for the feeling it caused?
   A. 0 times
   B. 1 or 2 times
   C. 3 to 9 times
   D. 10 to 19 times
   E. 20 to 39 times
   F. 40 or more times

4. During the past 30 days, how many times did you use a prescription pain reliever not prescribed to you or you took only for the feeling it caused on school property?
   A. 0 times
   B. 1 or 2 times
   C. 3 to 9 times
   D. 10 to 19 times
   E. 20 to 39 times
   F. 40 or more times

Figure 1. Instructions and Items Regarding Prescription Pain Relievers Used for the Expert Panel Review

Content Validity

The most important element related to content validity is *representativeness*. That is, the instrument must examine all the content areas adequately (McDermott & Sarvela,

1999). Specifically, the question, "do the items adequately represent non-medical prescription drug use prevalence?" needed to be answered. After developing the prescription drug abuse items in a format based upon the review of existing items, I enlisted a panel of national experts (see Appendix B) who used guidelines to further establish content validity of the survey items. These "experts" asked to conduct the review included professionals with expertise in the area of study, measurement specialists, and those familiar with the target audience as suggested by McDermott & Sarvela (1999). Specifically, the experts consisted of two professors of pharmacy, both with research interests in prescription drug abuse surveillance and prevention; the vice-president of risk management and health policy at a major pharmaceutical manufacturing firm; an adjunct professor of behavioral biology at a school of medicine, and vice president for research and health policy at a consulting firm specializing in public health and addiction treatment policy; a behavioral scientist and expert in youth risk behaviors from the Division of Adolescent and School Health at the Centers from Disease Control and Prevention who has worked with the YRBS since its inception in 1991; a professor in the department of community and family health at a college of public health with research interests in health behavior, adolescent health, and measurement; an assistant professor specializing in statistics, measurement, and psychometrics from a college of education; and a professor in the department of applied health science at a college of health, physical education and recreation with research and teaching interests in measurement and evaluation of health education programs.

Once members agreed to serve on the panel through electronic mail (e-mail) correspondence, they were sent a follow-up e-mail message consisting of a cover letter

and an embedded hyperlink directing them to the Web-based item review instrument on February 2, 2006 (see Appendix C). An abstract of my proposed research study (Appendix D) and a text document containing the items for review were also attached to the e-mail (see Appendix E). When expert panelists were ready to conduct the review, they simply selected the link which connected them to the questionnaire and contained explicit directions for the assessment of the items, their instructions, and response options (Appendix F). Perseus Survey Solutions® Express, Web-based survey software, was used to design the expert panel review instrument and subsequently manage responses as they were submitted by the reviewers. A screen capture of the Web-based survey instructions is provided in Figure 2.

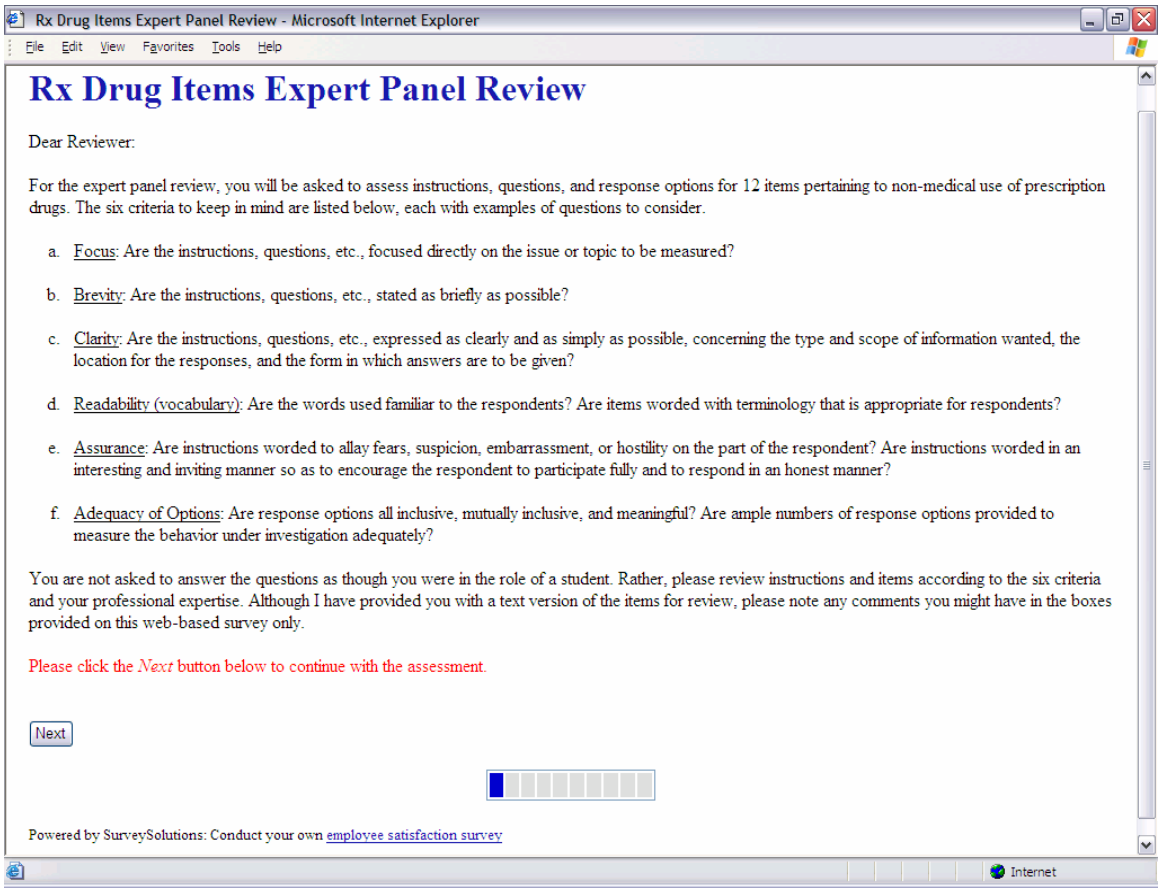

Figure 2. Screen Capture of the Web-based Expert Panel Review Form

The criteria for item assessment were based upon six important attributes of survey instructions and questions (i.e., focus, brevity, clarity, readability, assurance, and adequacy of response options) adapted from Weiler's (1997) expert panel review. The panelists were also asked to provide their professional opinion regarding the currency of "slang" or "street" terms for prescription drugs commonly used by illicit users. Because some of the panelists chosen were not experts in prescription drug abuse, but rather, experts in measurement or youth risk behaviors, all were not expected to respond to these items. Finally, the panel members were encouraged to provide additional comments and recommendations regarding any aspect of the survey.

Overall, the response to the expert panel review was positive. However, the experts did offer numerous comments for revision (see Appendix G). Some of the more substantive suggestions included the need to evaluate the usefulness of the operational definition of prescription drug abuse used in the survey; condensing the instructions in order to improve readability; the addition or deletion of selected drug (either trade or slang) names based on current trends; the addition of a response option for the items addressing 30 day prevalence; and the integration of two additional items— one assessing where the students are obtaining the drugs and the other, asking the students to indicate reasons for taking the drugs. In addition, a small number of formatting suggestions were offered, such as boldfacing or italicizing selected terms.

Upon review of the responses, it became clear that further dialogue with one or more of the panelists who had expertise in prescription drug use and abuse would be helpful to come to an agreement as to which items should be modified and to what extent they should be changed. I first arranged a phone conference with the vice-president of

risk management and health policy at a pharmaceutical firm. We discussed the validity of the operational definition of non-medical prescription drug use as taking a prescription drug "that was not prescribed to you or you took only for the feeling it caused," frequently used on federally-sponsored surveys (i.e., National Survey on Drug Use and Health). This definition has been criticized as imprecise because it may not only capture intentional illicit use but also therapeutic use (e.g., a pain reliever offered to them by their parent for an appropriate reason— analgesia). We discussed strategies to validate the definition by including additional items. These additional items would ask respondents to choose from reasons for use (i.e., the experiences or feelings sought from using the drugs non-medically). This would allow me to conserve the definition used on Federal surveys for the sake of comparison. It would also allow me to determine the students who may not truly be abusing the drugs, but rather, using for the therapeutic purpose, just without a doctor's permission. During the phone conversation, we also discussed the inclusion of items exploring where the students get the prescription drugs for non-medical use.

Based on that conference and reviewer comments, I then modified the initial set of items by: significantly minimizing the length of instructions pertaining to each drug class—completely removing the second, fifth, and sixth sentences from each prompt; adding a single item regarding prescription drug abuse as a weight loss tactic; adding two items for each drug class— addressing sources of the drugs (see items 52, 57, and 63) and reasons for use (see items 52, 58, and 64); adding the response option "G. 100 or more times" to the items pertaining to 30-day prevalence; and boldfacing the terms "on school property." Upon revision, the new set of items was e-mailed to the four content

reviewers for assessment, none of which had further suggestions. Thus, as a result of the expert panel review process, the 19 prescription drug abuse-related items were subsequently modified for the pilot study.

Human Subjects

Before initiation of any study components involving human participants, an application to the University of Florida Institutional Review Board (UFIRB) was submitted (Appendix H). The UFIRB reviews all University of Florida research projects involving human subjects. Because Santa Rosa County agreed to oversee the administration of parental consent forms and survey materials and maintain anonymity of the research participants, the researcher's role was classified as secondary data analyst (Appendix I). Thus the study, project number 2006-U-0164, was deemed exempt from further university review in accordance with the Federal Office for Human Research Protections (OHRP) code number 45 CFR 46.101b(4) (see Appendix J).

Pilot Study

A pilot study can be thought of as a "dress rehearsal" for the larger research study in which methods, materials, and procedures to be used are tested for feasibility and appropriateness among the target population (McDermott & Sarvela, 1999). The pilot study often involves the administration of a preliminary survey on a small, convenience sample, permitting the researcher to obtain vital feedback regarding data collection instruments, instructional material, data collection procedures, and data analysis procedures (Alreck & Settle, 2004). In the case of a survey, the pilot study is crucial, in that it allows the researcher to estimate the length of time needed to complete the survey. Any problems detected in the pilot study can therefore be corrected before the project

details are finalized and the larger, formal survey conducted (McDermott & Sarvela, 1999).

The pilot study served not only to test the procedures used for administration of the SRCHBS but also allowed me to assess test-retest reliability of the newly constructed items. Test-retest reliability is concerned with the extent to which responses on survey items are similar when administered at two points in time (McDermott & Sarvela, 1999). This type of reliability estimates the stability of repeated measures and is often conducted on items that assess surveillance data (McDermott & Sarvela, 1999; Brenner et al., 2002). In this approach, respondents complete the instrument twice and a coefficient is computed for the relationship between the scores on the first and second administrations (Di lorio, 2005).

Four teachers from a moderately large sized high school in Northwest Florida were recruited for the pilot study. They were selected in a conveniently sampled fashion, by the school principal to facilitate the survey in two of their classes. Each of the four teachers taught a sample of students representing one of four grade levels: 9, 10, 11, and 12. One of the teachers taught 9th grade health and the remaining three teachers taught English (grades 10, 11, and 12.)

A total of 209 students were registered for the classes recruited for the pilot study. Two weeks before study initiation, on February 21, 2006, students received parental consent forms and were instructed to present them to their parents or guardians and return them to their teachers no later than March 10, 2006 (see Appendix K). No student in the sample returned a form in which a parent or guardian refused consent for their child's participation in the study.

Because they served as "data collection assistants" for the pilot study, the four teachers who agreed to participate received a brief instructional session on March 20, 2006, describing the study and the protocol designed for collecting data (Appendix L). The teachers were instructed not to deviate from the protocol when administering the survey. These steps were taken to ensure uniformity in conducting the survey. At the instructional meeting, participating teachers were also presented with a small token of appreciation in the form of a thank-you card and a $50.00 gift certificate to a local restaurant.

Data collection procedures employed by Brener et al. (2002) were used for the pilot study, as this test-retest technique has been used successfully in previous studies and adequately safeguards students' privacy. Before the first survey administration, a unique number was assigned to two Scantron© answer sheets. Each set of identically numbered answer sheets was placed inside a separate questionnaire booklet: one marked with the letter "A" in the upper right-hand corner, and the other marked with the letter "B". These two surveys each consisted of the same 102 core items and differed only in that survey "A" prompted students to offer written comments about any items they felt were confusing or unclear. This provision allowed students the opportunity to express any concerns about the newly added items. Both pairs of Scantron© sheet/booklet sets were placed in a large envelope.

On March 21, 2006 the students were given a class period to complete the first "test" of the SRCHBS. Students were instructed to remove and use only answer sheet/booklet set "A" during the first administration. Answer sheet/booklet set "B" was to remain in the envelope which was then sealed by the student. Students were

subsequently instructed to write their name across the seal. Survey start time; time the first student finished; and time the last student finished the 102-item survey instrument was recorded during the survey administration by the teachers. The mean completion time (and standard deviation), for the fastest students was 21.25 (SD=5.39) minutes, and was 38.00 (SD=9.62) minutes for the slowest students. Completed answer sheets were then placed in a large envelope and sealed by the teacher in full view of the students. Of the 209 students enrolled for the classes participating in the pilot study, 23 students were absent and two students chose not to participate in the survey on the first testing day, therefore providing 188 survey responses.

On April 4, 2006, 14 days from the first survey administration, students were asked to re-take the SRCHBS. Before the second survey administration, each student who participated in the first test received the envelope with his or her name written across the seal. After removing and completing survey "B," the students' answer sheets were collected and the empty envelopes were deposited in a wastebasket. Envelopes belonging to students who were absent on the second survey administration were also disposed of. Throughout all the methodological steps, considerable attention and emphasis was placed on ensuring anonymity, privacy, and confidentiality among all student respondents.

Of the 188 students present on the first testing day, 13 were absent on the second testing day, thus providing 175 response set pairs. Upon visual inspection of the response pairs, 18 sets were deemed unusable when reasonable exclusion criteria were applied, therefore yielding 157 completed sets. The pre-specified criteria included: completion of less than one-half of the 19 relevant items; indication of blatant patterning (e.g., use of

one response option only, Christmas-treeing, etc.); and use of response options that were not viable.

Although the simple reliability coefficient can be used as an estimate of test-retest reliability, I chose to compute the Kappa (**κ**) coefficients for items of interest upon completion of the pilot study. The simple reliability coefficient is easy to calculate and understand. However, a disadvantage to that approach is that it does not take chance agreement into consideration (Di lorio, 2005). Many researchers cite the ***κ*** statistic as being the "most appropriate method of analysis between raters or events when the data are categorical" (Tooth & Ottenbacher, 2004, p. 1372). Kappa is an extension of simple percent agreement in that it is "...the proportion of the total amount of agreement not explained by chance for which the observers accounted" (Cohen, 1960, p. 38). Thus, the most acceptable reliability statistic, adjusting for the agreement based on chance, is the **κ** coefficient, calculated using the formula:

$$\boldsymbol{\kappa} = (P_o - P_c)/(1 - P_c),$$

where

κ = Kappa,

P_o = the proportion of the total number of observations in agreement, and

P_c = the proportion of observations in the agreement cells expected by chance given the marginal distributions (Di lorio, 2005).

Although Kappa values can range from -1.0 to 1.0, values greater than zero are most typical and indicate agreement better than chance. For example, a κ of 0.60 means that the student responses to the instrument account for 60% of the agreement over and

above what would be expected by chance alone. Kappa values less than zero therefore, indicate agreement worse than chance.

Various interpretations of the Kappa statistic have been proposed and differ only slightly (Tooth & Ottenbacher, 2004). Researchers however, often cite the benchmarks offered by Landis and Koch (1977) as the rough cut points for interpretation (Table 1). Scholars therefore agree that κ values between 0.21 and 0.40 are fair, those between .41 and .60 are moderate, those between .61 and .80 are substantial, and those above .80 are near perfect (Landis & Koch, 1977; Tooth & Ottenbacher, 2004).

Table 1. Benchmarks for Interpretation of the Kappa Statistic (Landis & Koch, 1977)

Kappa Statistic	Strength of Agreement
<0.00	Poor
0.00-0.20	Slight
0.21-0.40	Fair
0.41-0.60	Moderate
0.61-0.80	Substantial
0.81-1.00	Almost Perfect

Item Reliability

As estimates of test-retest reliability, simple Kappa values were calculated for all items and weighted values for Kappa were calculated for selected items (Table 2). Simple and weighted Kappas have separate but related indications for use. The simple κ considers all disagreements in ratings as equal in "weight," as for truly nominal data. When there is an implied ranking in the data, as for a likert-type ordinal scale however, weighted κ may become more useful (Tooth & Ottenbacher, 2004). A weighted κ treats

disagreement in response options that are similar as less significant than disagreements that are dissimilar. For example, when referring to prevalence-related items on the SRCHBS one student may have responded they used prescription pain relievers "1 or 2 times" during test one and "3 or 4 times" during test two. For the same item, a second student may have answered "1 or 2 times" during test one and "44 to 99 times" during test two. These two students would have influenced simple κ in exactly the same way. However, the first student, whose responses were not the same but still similar, would have influenced weighted κ less than the second student who provided divergent answers during the two tests. Therefore, both simple and weighted Kappa values may be useful when assessing the reliability of ordinal response options, specifically those regarding prevalence and age at first use on the SRCHBS.

According to the pilot test analysis, simple Kappa values for 14 of the 19 items fell within the range of "good" or "excellent." Two items had a Kappa within the "moderate" range and three items fell within in the "poor" range. Due to the nominal nature of some of the response options, weighted Kappa was only computed for items with ordinal response options. Of the 10 items for which weighted κ was calculated, four items fell within the "excellent" range. Two fell within the "good" and two fell within the "moderate" ranges. One item performed in the "poor" range. Weighted κ for three applicable items could not be computed due to the fact that too few response options were indicated in the student data set. Because an overwhelming majority of the items fell within the "moderate," "good," or "excellent" range of test-retest reliability, the items were deemed appropriate for further use in the main study.

Table 2. The Santa Rosa County Health Behavior Survey Pilot Study: Measures of Test-Retest Reliability for Prescription Drug Abuse Items Using Kappa (***κ***) Statistics

Item	n	Simple ***κ*** (95% CI)	Weighted ***κ*** (95% CI)
1. Pain Relievers: Lifetime use	157	0.77 (0.66, 0.89)	0.90 (0.84, 0.96)
2. Pain Relievers: Age at first use	157	0.79 (0.68, 0.90)	0.89 (0.81, 0.97)
3. Pain Relievers: 30 day use	157	0.54 (0.33, 0.76)	0.56 (0.36, 0.77)
4. Pain Relievers: 30 day use at school	157	0.66 (0.05, 1.28)	----
5. Pain Relievers: Where obtained	157	0.85 (0.75, 0.95)	N/A
6. Pain Relievers: Why use	157	0.63 (0.51, 0.74)	N/A
7. Depressants: Lifetime use	157	0.66 (0.49, 0.84)	0.79 (0.65, 0.92)
8. Depressants: Age at first use	157	0.75 (0.58, 0.92)	0.83 (0.68, 0.99)
9. Depressants: 30 day use	157	0.32 (0.04, 0.59)	0.46 (0.16, 0.76)
10. Depressants: 30 day use at school	157	-0.00 (-0.01, 0.00)	-0.00 (-0.01, 0.00)
11. Depressants: Where obtained	157	0.79 (0.62, 0.95)	N/A
12. Depressants: Why use	157	0.75 (0.58, 0.92)	N/A
13. Stimulants: Lifetime use	157	0.75 (0.58, 0.92)	0.73 (0.53, 0.92)
14. Stimulants: Age at first use	157	0.74 (0.55, 0.93)	0.85 (0.69, 1.00)
15. Stimulants: 30 day use	157	0.42 (0.03, 0.81)	0.49 (0.14, 0.84)
16. Stimulants: 30 day use at school	157	0.66 (0.05, 1.28)	----
17. Stimulants: Where obtained	157	0.71 (0.51, 0.91)	N/A
18. Stimulants: Why use	157	0.80 (0.64, 0.96)	N/A
19. Prescription drug for weight loss	155	0.00 (-0.00, 0.00)	----

Data Collection

I served as the coordinator and principal data collector for this study. Data collection for the main study proceeded in a manner similar to that for the pilot test with some minor changes due to logistical constraints placed upon the researcher by school administrators. In my original proposal to the Santa Rosa County school district, I planned to administer the survey among all 9-12 grade students enrolled in a single high school. Of the prospective high schools contacted, none would agree to administration of the survey among the entire student body. However, two high schools did agree to conduct the study among only senior students and in a group setting. Thus, although the pilot study was conducted among 9 through 12 graders in a classroom setting, the final study population was comprised only of 12th grade students and took place in the cafeterias of the two participating high schools during group assemblies. Finally, rather than teachers, I served as the moderator for the larger study at both schools while teachers served as co-data collectors by assisting in the distribution and collection of survey materials. Unlike the pilot study for which no students were denied parental permission, a total of four students returned forms denying permission to participate. Teachers were instructed not to distribute surveys to these students.

In order to maximize student participation, the self-administered SRCHBS in the form of a survey booklet and Scantron© answer sheet was provided to all participants during a senior assembly. Sharpened pencils were also distributed to students who neglected to bring their own. On May 1, 2006, the survey was administered to 12th grade students at the first high school during a first period student assembly. While the first survey was underway, I left the head guidance counselor in charge of collecting the finished surveys while I traveled to the second school to administer the survey during a

second period student assembly. The use of a single class period at both high schools allowed for administration of the survey to all students at the same time and in a similar setting, and helped control for the disruption of other school procedures. Survey administration during class periods earlier in the day also helped control for students who had afternoon jobs or who were dual-enrolled in college courses.

Data Analysis

Student data from electronic answer sheets were scanned by an optical scanner, saved in ASCII format, transferred to a data file, and then analyzed using the Statistical Analysis System (SAS), version 9.1. Descriptive statistics were first generated to develop a demographic profile of the sample. Unadjusted prevalence rates were calculated by dividing the number of students reporting the behavior by the total number of students in the sample

Inferential statistics were then used to (1) examine the relationships between demographic characteristics with prescription drug abuse risk behaviors and (2) answer the research questions. Chi square statistics ($\chi 2$) were first used to determine whether individual demographic characteristics (i.e., gender, grade, race) were associated with prescription drug abuse. Chi-square analysis is a test of significance "appropriate when data are in the form of frequency counts occurring in two or more mutual mutually exclusive categories" (Gay, 1996). The dependent variable, prescription drug abuse, was represented as a dichotomous (yes/no) variable taken from the composite of prevalence items that correspond to the three major classes of abusable prescription drugs: opioid pain relievers, central nervous system stimulants, and central nervous system depressants. Demographics were treated as nominal variables with the following corresponding levels: Gender (male, female), grade (9th, 10th, 11th, 12th, ungraded), and race (American

Indian/Alaska Native, Asian, Black/African American, Hispanic/Latino, Native Hawaiian or Other Pacific Islander, White, Other). Chi square test compares proportions actually observed in a study with proportions expected thus, providing a measure of how much the frequencies differ from one another.

Five assumptions underlie the use of the chi-square statistic:

1. Each observation must fall in one and only one category.
2. The observations in the sample are independent of one another.
3. The observations are measured as frequencies.
4. The expected frequency for each category is not less than 5 for $df \geq 2$ and not less than 10 for $df = 1$.
5. The observed values of χ^2 with 1 degree of freedom must be corrected for continuity in order to use the table of values of $\chi^2_{critical}$. (Shavelson, 1995)

Multiple logistic regression was then used to predict the student level outcomes of prescription drug abuse when controlling for demographic characteristics that were significantly associated with prescription drug abuse according to the chi-square results. Logistic regression is a type of regression analysis where the dependent variable is a dummy variable (coded 0 or 1) and the independent variable can be of any type (Agresti, 1996). The logistic regression model is simply a non-linear transformation of the linear regression, using a "logit" distribution rather than a normal distribution, which constrains the estimated probabilities to lie between 0 and 1 (Agresti, 1996).

Multiple logistic regression also allowed for me to examine the relationship between non-medical prescription drug use and the likelihood of engaging in the other risk behaviors addressed by the research questions. Specifically, those behaviors

included driving under the influence of alcohol or riding with a drunk driver; tobacco, alcohol, and marijuana use; other illicit drug use including cocaine/crack, inhalants, heroin, methamphetamines, ecstasy, or heroin; violence-related behaviors; sadness, suicide ideation and attempts; sexual risk taking, and the use of problem weight loss tactics.

When conducting logistic regression, significance is most conveniently understood using the odds ratio. The odds ratio is commonly interpreted as the probability of the event (or "yes" outcome) divided by the probability of the nonevent (or "no" outcome) (Agresti, 1996). In Chapter 4, results for the logistic regression are therefore reported in the form of odds ratios and 95% confidence intervals in addition to regression coefficient and test statistic.

Summary

Chapter 3 described the methods and materials used to conduct this study. It provided a description of the study's purpose, research design, research variables, participants, instrumentation, data collection, and data analysis. Chapter 4 reports the results associated with the nine research questions in addition to providing an overview of the demographics and prevalence estimates of prescription drug abuse among study participants.

CHAPTER 4
RESULTS

This study explored the relationships between non-medical prescription drug use and other related adolescent risk behaviors using the Santa Rosa County Health Behavior Survey (SRCHBS)—a version of the 2005 Youth Risk Behavior Survey modified to include measures of prescription drug abuse.

In this chapter, I present the data I collected by the methods described in Chapter 3 using the SRCHBS. Specifically, I describe the demographic characteristics for the study participants; illustrate the profile for prescription drug misuse among respondents; and report the findings of data analyses relating to my research questions.

Participant Demographics

This section describes the demographic characteristics of the participants surveyed in this study. The defined population was all 12th grade students enrolled at two Northwest Florida senior high schools during the last quarter of the 2005-2006 academic year (N=727). Three-hundred and eighty-seven senior students were enrolled at the first school and 340 were enrolled at the second. An attempt was made to reach every member of the senior class at these two schools. This is commonly referred to as a census survey.

Of the population of 727 seniors from the two schools combined, 229 and 256 students returned the questionnaires from the first and second school, respectively. As a result of sight-editing the answer sheets, I disregarded 24 cases from the first and 26 cases from the second school from the data analysis, yielding a total of 435 useable

questionnaires. As in the pilot study, rejection of a collected survey was based on completeness of sections, and on the identification of patterned, hostile, or superfluous responses. In addition, students indicating a grade level other than 12 were also removed from the sample. A summary of participation rates by schools is provided in Table 3.

Table 3. Santa Rosa County Health Behavior Survey: Participation Rate by High School

High School	Enrollment	Returned	Useable	Participation Rate (%)
School 1	387	229	205	54.0
School 2	340	256	230	67.6
Total	**727**	**485**	**435**	**59.8**

Of the total useable responses, 48.2% were from males (n=208) and 51.8% (n=224) were from females, with a mean age of 17.6 (SD=0.49) years old. Over three-quarters of the participants were White (n=338, 78.6%). Hispanics, Blacks and Asians represented 5.4% (n=23), 4.4% (n=19), and 3.5% (n=15) of the sample, respectively. Other racial/ethnic minority groups (including American Indians/Alaska Natives and Pacific Islanders) made up approximately 8.1% (n=35) of the sample. Table 4 provides the demographic characteristics of the participants from the two schools and of the total study sample.

Because the study population has been defined as the composite of 12th grade students from both schools, results will hereafter be reported for the total sample and not for each school individually.

Table 4. Santa Rosa County Health Behavior Survey: Demographic Characteristics of Participants (expressed in percentages)*

Demographic	School 1	School 2	Total
Gender (n= 432)			
Male	42.9	52.9	48.2
Female	57.1	47.1	51.8
Race (n= 430)			
American Indian/Alaska Native	2.5	1.8	2.1
Asian	2.9	4.0	3.5
Black	1.5	7.1	4.4
Hispanic	3.4	7.1	5.4
Pacific Islander	0.5	1.3	0.9
White	86.3	71.7	78.6
Other	2.9	7.1	5.1
Age (n= 426)			
16	0.5	0.0	0.2
17	31.8	40.0	36.2
18	67.7	60.0	63.6

* Columns may not sum to 100% based on rounding error.

Profile of Non-Medical Prescription Drug Use Behaviors

This section describes respondents' self-reported non-medical prescription drug use behaviors. Table 5 illustrates the composite prevalence estimates of lifetime, past 30 day use, and past 30 day non-medical use on school property of *any* prescription drug. Close to one third (n=138, 31.9%) of respondents indicated lifetime prevalence of any class of prescription drug— that is one or more instances of non-medical use of either prescription pain relievers, depressants, or stimulants; or any combination of the three. Sixteen percent (n=69) of the subjects indicated past 30 day misuse, and 8.8% (n=38) indicated past 30 day misuse on school property of any prescription drug.

Table 5. Santa Rosa County Health Behavior Survey: Lifetime, Past 30 Day, and Past 30 Day Non-Medical Use on School Property of *any* Prescription Drug

Prevalence Estimate	n	%
Lifetime use		
Ever	138	31.9
Never	295	68.1
Past 30 day use		
Yes	69	16.0
No	361	84.0
Past 30 day use on school property		
Yes	38	8.8
No	392	91.2

Table 6 illustrates specific participant responses to the items assessing lifetime use, past 30 day use, and past 30 day use on school property found on the SRCHBS as classified by drug class. Results are reported as frequencies and percentages. The highest rates of non-medical prescription drug use are for pain relievers, followed by depressants and stimulants. Close to 30 percent (n=124, 28.6%) of respondents indicated lifetime non-medical use of pain relievers, several of which tried the drugs only one or two times (n=47, 10.8%). However, as many as 13 students indicated extremely heavy lifetime use in the range of 100 or more times. Regarding depressant drugs, 12.7% (n=55) of the students indicated lifetime use. Less than one-tenth of the respondents (n=39, 9%) reported lifetime stimulant non-medical use.

Table 6. Santa Rosa County Health Behavior Survey: Measures of Non-Medical Prescription Drug Use Prevalence by Drug Class (expressed in frequencies and percentages)

Item	Pain Relievers		Depressants		Stimulants	
Response Option	n	%	n	%	n	%
Lifetime use						
0 times	310	71.4	379	87.3	394	91.0
1 or 2 times	47	10.8	25	5.8	13	3.0
3 to 9 times	29	6.7	14	3.2	3	0.7
10 to 19 times	13	3.0	7	1.6	13	3.0
20 to 30 times	10	2.3	2	0.5	5	1.2
40 to 99 times	12	2.8	4	0.9	4	0.9
100 or more times	13	3.0	3	0.7	1	0.2
Past 30 day use						
0 times	377	87.0	402	93.1	408	94.7
1 or 2 times	28	6.5	15	3.5	4	0.9
3 to 9 times	12	2.8	7	1.6	9	2.1
10 to 19 times	8	1.9	5	1.2	2	0.5
20 to 30 times	3	0.7	2	0.5	5	1.2
40 to 99 times	3	0.7	1	0.2	1	0.2
100 or more times	2	0.5	0	0.0	2	0.5
Past 30 day use on school property						
0 times	403	93.1	423	97.7	415	96.3
1 or 2 times	14	3.2	2	0.5	5	1.2
3 to 9 times	6	1.4	7	1.6	4	0.9
10 to 19 times	6	1.4	1	0.2	1	0.2
20 to 30 times	3	0.7	0	0.0	4	0.9
40 to 99 times	1	0.2	0	0.0	1	0.2
100 or more times	0	0.0	0	0.0	1	0.2

Far fewer students reported past 30 day non-medical use of prescription drugs, often used as a proxy measure of current use. Thirteen percent (n=56) of respondents indicated past 30 day use of pain relievers, while 6.9% (n= 30) and 5.3% (n=23) reported past 30 day use of depressant and stimulant drugs, respectively. Less than 10% of respondents indicated past 30 day use while on school property for any of the three drug classes. Prevalence rates of past 30 day use while on school property rates of were 6.9%

(n=30), 2.3% (n=10), and 3.7 (n=16) for pain relievers, depressants, and stimulants, respectively.

According to estimates obtained from the survey, prevalence of non-medical prescription drug use ranks high, second only to marijuana. As seen in Table 7, the non-medical use of both prescription pain relievers and depressants is more common than ecstasy use. Non-medical use of prescription stimulants is more prevalent than the use of methamphetamine, steroids, heroin, or injected drugs.

Table 7. Lifetime, 30-Day, and 30-Day on School Property Prevalence of Selected Drug Classes (expressed in percentages)

Drug Class	Lifetime	30-day*	30-day on school property*
Marijuana	39.9	18.9	4.2
Any Prescription Drug	31.9	16.0	8.8
Prescription Pain Relievers	28.6	12.9	6.9
Prescription Depressants	12.7	6.9	2.3
Ecstasy	11.7	---	---
Huffing (i.e., Paint, Glue, Sprays)	11.6	---	---
Cocaine	10.7	5.8	---
Prescription Stimulants	9.0	5.3	3.7
Methamphetamine	6.3	---	---
Steroids	4.2	---	---
Heroin	3.0	---	---
Injected Drugs	2.1	---	---

* Selected drug classes were not assessed for 30-day and 30-day on school property prevalence.

Table 8 illustrates participant responses to the items assessing age at first use, source of the specific drug, and motivations for non-medical use. These results are also categorized by drug class and feature the frequencies and percentages of specific response options found on the SRCHBS. For each of the three drug classes, the majority of students reported non-medical prescription drug use initiation at the age of 15 years old or older. When asked where they obtained the prescription drugs for non-medical

use, the most frequent response across all three drug classes was “a friend.” However other common responses for pain relievers were “took my own” (n=20, 4.6%), and “from a parent or guardian with their permission” (n=19, 4.4%). For depressants, the next most common responses were “from a parent or guardian with their permission” (n=7, 1.6%), and “from a parent or guardian without their permission” (n=7, 1.6%). For stimulants, the next most common responses regarding sources of prescription drugs were “took own” (n=6, 1.4%) and “other” (n=3, 0.7%).

Regarding motivations for prescription drug misuse, “to get buzzed, high, or stoned” was the response option chosen most frequently for each of the three drug classes. The next most common responses were “to relieve physical pain” (n=29, 6.7%) and “to experiment” (n=17, 3.9%) for pain relievers; “to experiment” (n=12, 2.8%) and “to relax or relieve stress” (n=8, 1.9%) for depressants; and “to experiment” (n=9, 2.1%) and “to concentrate or study” (n=4, 0.9%) for stimulants.

Table 8. Santa Rosa County Health Behavior Survey: Self-Reported Age at First Use, Drug Source, and Motivations for Non-Medical Use by Drug Class (expressed in frequencies and percentages)

Item	Pain Relievers		Depressants		Stimulants	
Response Option	n	%	n	%	n	%
Age at first use						
Never used	307	70.7	372	85.9	395	91.4
8 years or younger	7	1.6	3	0.7	1	0.2
9 or 10 years old	4	0.9	5	1.2	2	0.5
11 or 12 years old	7	1.6	2	0.5	5	1.2
13 or 14 years old	29	6.7	11	2.5	10	2.3
15 or 16 years old	45	10.4	19	4.4	11	2.6
17 years old or older	35	8.1	21	4.9	8	1.9
Where obtained the Rx drug						
Never used	314	72.5	378	87.3	392	91.0
Took own	20	4.6	2	0.5	6	1.4
From a parent w/ permission	19	4.4	7	1.6	1	0.2
From a parent w/o permission	5	1.2	7	1.6	2	0.5
From brother or sister	3	0.7	1	0.2	2	0.5
From another relative	1	0.2	0	0.0	0	0.0
From a friend	54	12.5	35	8.1	24	5.6
Stolen from a pharmacy/doctor's	3	0.7	0	0.0	1	0.2
From the Internet	1	0.2	0	0.0	0	0.0
Other	13	3.0	3	0.7	3	0.7
Why used the Rx drug						
Never used	309	71.5	380	87.8	392	91.2
To experiment	17	3.9	12	2.8	9	2.1
To get buzzed, high, or stoned	42	9.7	21	4.9	15	3.5
To fit in	2	0.5	0	0.0	1	0.2
To get away from problems	8	1.9	5	1.2	3	0.7
To alter the effects of other drugs	3	0.7	4	0.9	1	0.2
To relax or relieve stress	13	3.0	8	1.9	N/A	N/A
To help sleep	2	0.5	0	0.0	N/A	N/A
To relieve physical pain	29	6.7	0	0.0	N/A	N/A
To get more energy or stay awake	N/A	N/A	N/A	N/A	3	0.7
To concentrate or study	N/A	N/A	N/A	N/A	4	0.9
To lose weight	N/A	N/A	N/A	N/A	1	0.2
Other	7	1.6	3	0.7	1	0.2

Chi-Square Analysis

Before answering the research questions, it was first necessary to conduct chi-square analyses to determine whether individual demographic characteristics (i.e., gender and race/ethnicity) were associated with non-medical prescription drug use. In order to compute a valid chi-square test, it is important to ensure that a minimal number of categories has an expected frequency greater than or equal to 5. Because some levels of the race/ethnicity variable were rarely cited, six levels— African American, American Indian, Asian, Hispanic, Pacific Islander, and Other—were collapsed to form the "Non-White" category.

According to the chi-square analyses (Table 9), no significant difference exists between prevalence rates and relevant demographic variables at the $\alpha = 0.05$ significance level.

Chi-square analyses were also conducted among the individual prescription drug classes— pain relievers, depressants, and stimulants. The values presented in tables 10, 11, and 12 illustrate that no significant difference (at the $\alpha=0.05$ level) exists among prevalence rates for individual drug class based upon demographic classification.

Table 9. Chi-square Analysis of Demographic Variables by Lifetime, Past 30 Day, and Past 30 Day on School Property Prevalence of *any* Non-Medical Prescription Drug Use

	Lifetime			Past 30 Day			Past 30 Day on School Property		
Demographic Variable	n	%	χ^2 p-value	n	%	χ^2 p-value	n	%	χ^2 p-value
Gender[a]									
Male	70	33.0	0.70	35	17.1	0.62	21	10.2	0.35
Female	68	31.3		34	15.3		17	7.7	
Race/Ethnicity[b]									
White	110	33.0	0.80	56	16.6	0.68	28	8.3	0.38
Non-White	28	31.1		8	14.8		10	11.3	

[a]The sample size for the "Lifetime" χ^2 analysis was 430 cases whereas the sample size for the other two χ^2 analyses was 427 cases. [b]The sample size for the "Lifetime" χ^2 analysis was 428 cases whereas the sample size for the other two χ^2 analyses was 425 cases.

Table 10. Chi-square Analysis of Demographic Variables by Lifetime, Past 30 Day, and Past 30 Day on School Property Prevalence of Non-Medical Prescription *Pain Reliever* Use

	Lifetime Use			Past 30 Day Use			Past 30 Day Use on school Property		
Demographic Variable	n	%	χ^2 p-value	n	%	χ^2 p-value	n	%	χ^2 p-value
Gender[a]									
Male	63	30.4	0.46	28	13.5	0.76	18	8.7	0.18
Female	61	27.2		28	12.6		12	5.4	
Race/Ethnicity[b]									
White	97	28.7	0.86	44	13.0	0.93	21	6.2	0.21
Non-White	27	29.7		12	13.3		9	10.0	

[a]The sample size for the "Lifetime" χ^2 analysis was 431 cases whereas the sample size for the other two χ^2 analyses was 430 cases. [b]The sample size for the "Lifetime" χ^2 analysis was 429 cases whereas the sample size for the other two χ^2 analyses was 428 cases.

Table 11. Chi-square Analysis of Demographic Variables by Lifetime, Past 30 Day, and Past 30 Day on School Property Prevalence of Non-Medical Prescription *Depressant* Use

	Lifetime Use			Past 30 Day Use			Past 30 Day Use on school Property		
Demographic Variable	n	%	χ^2 p-value	n	%	χ^2 p-value	n	%	χ^2 p-value
Gender									
Male	25	12.1	0.70	11	5.3	0.17	5	2.4	0.89
Female	30	13.4		19	8.5		5	2.2	
Race/Ethnicity									
White	44	13.0	0.81	25	7.4	0.56	8	2.4	0.94
Non-White	11	12.1		5	5.6		2	2.2	

[a]The sample size for the "Lifetime" χ^2 analysis was 431 cases; sample sizes for the "Past 30 Day" and Past 30 Day on School Property" χ^2 were 427 and 430 cases, respectively.
[b]The sample size for the "Lifetime" χ^2 analysis was 429 cases; sample sizes for the "Past 30 Day" and Past 30 Day on School Property" χ^2 were 427 and 428 cases, respectively.

Table 12. Chi-square Analysis of Demographic Variables by Lifetime, Past 30 Day, and Past 30 Day on School Property Prevalence of Non-Medical Prescription *Stimulant* Use

	Lifetime Use			Past 30 Day Use			Past 30 Day Use on school Property		
Demographic Variable	n	%	χ^2 p-value	n	%	χ^2 p-value	n	%	χ^2 p-value
Gender									
Male	20	9.7	0.66	11	5.4	0.99	10	4.9	0.23
Female	19	8.5		12	5.4		6	2.7	
Race/Ethnicity									
White	32	9.5	0.62	17	5.0	0.53	10	3.0	0.10
Non-White	7	7.8		6	6.7		6	6.7	

[a]The sample size for the "Lifetime" χ^2 analysis was 430 cases ; sample sizes for the "Past 30 Day" and Past 30 Day on School Property" χ^2 were 427 and 428 cases, respectively.
[b]The sample size for the "Lifetime" χ^2 analysis was 428 cases whereas the sample size for the other two χ^2 analyses was 426 cases.

As illustrated in Table 13, logistic regression analysis confirmed the results of the chi square analyses. Odds of prescription drug misuse were not significantly influenced by the relevant demographic variables at the $\alpha = 0.05$ level. Although no significant

difference exists for demographic variables by prevalence rates, previous research has demonstrated contrary results among high school students (McCabe & Boyd et al., 2005; McCabe, Teter, & Boyd, 2004; McCabe, Teter, Boyd, & Guthrie, 2004). The absence of an effect may be due in part to low sample size. In addition, the variables of race and gender may interact with the study's independent variables in important ways that did not surface in these chi square and odds ratio analyses. Due to these circumstances, it was determined that it would be prudent to control for race and gender in the multivariate models when addressing the research questions.

Table 13. Odds of Lifetime, Past 30 Day, and Past 30 Day on School Property Prevalence of Prescription Drug Abuse by Demographic Characteristics

	Lifetime		Past 30 Day		Past 30 Day on School Property	
Demographic Variable	OR[a]	95% CI	OR[a]	95% CI	OR[a]	95% CI
Gender						
Male	—	—	—	—	—	—
Female	0.92	(0.62, 1.39)	0.88	(0.52, 1.47)	0.74	(0.38, 1.44)
Race/Ethnicity						
White	—	—	—	—	—	—
Non-White	0.94	(0.57, 1.55)	0.87	(0.45, 1.68)	1.41	(0.65, 3.02)

—Reference category. The sample size for the "Lifetime" model was 425 cases whereas the sample size for the other two models was 422 cases. [a]Odds ratios are adjusted for the predictor variables, gender and race/ethnicity, in all three models.

Research Question One

Is there a relationship between illicit drug use (i.e., marijuana, cocaine, inhalants, heroin, methamphetamine, ecstasy, and steroids) and non-medical prescription drug use among a sample of 12th grade students? Logistic regression analyses were used to determine whether the use of several types of illicit drugs were associated with non-medical use of prescription drugs after adjusting for gender and race/ethnicity. Both

lifetime and 30-day prevalence rates of non-medical prescription drug use were examined. Tables 14 through 17 report the odds ratios obtained from the constructed logistic regression models. As illustrated in Table 14, non-medical use of any prescription drug was highly correlated to illicit substance use.

Table 14. Illicit Substance Use Behaviors Associated with Lifetime and Past 30-Day Non-Medical Use of Prescription any Prescription Drug

	Lifetime non-medical prescription drug use			Past 30 day non-medical prescription drug use		
Illicit substance use behaviors	Use %	No use %	Adjusted OR [a,b] (95% CI)	Use %	No Use %	Adjusted OR [a,b] (95% CI)
Marijuana						
Lifetime use	71.1	25.1	7.1 (4.5, 11.1)***	75.4	33.2	5.9 (3.3, 10.7)***
Past 30 day use	42.0	7.8	8.3 (4.8, 14.4)***	60.9	10.8	12.6 (7.0, 22.7)***
Past 30 day on school property	9.4	1.4	7.4 (2.3, 23.0)**	18.9	1.1	20.4 (6.4, 65.2)***
Cocaine						
Lifetime use	25.6	3.8	8.7 (4.3, 17.8)***	32.4	6.7	6.7 (3.4, 12.9)***
Past 30 day use	13.9	2.1	7.6 (2.9, 19.7)***	22.1	2.8	9.9 (4.2, 23.7)***
Inhalants						
Lifetime use	26.3	4.8	6.9 (3.6, 13.4)***	30.9	8.0	5.0 (2.6, 9.5)***
Heroin						
Lifetime use	7.4	1.0	7.6 (2.0, 28.4)**	11.8	1.1	12.0 (3.5, 41.9)***
Methamphetamine						
Lifetime use	17.7	1.0	20.5 (6.0, 69.5)***	26.5	2.2	15.8 (6.5, 38.6)***
Ecstasy						
Lifetime use	31.6	2.4	19.0 (8.2, 43.9)***	45.6	5.0	16.4 (8.2, 32.5)***
Steroids						
Lifetime use	7.4	2.7	2.8 (1.1, 7.4)*	12.0	2.5	5.4 (2.0, 14.8)**

*P<0.05, **P<0.01, ***P<0.001. [a]The reference group for each logistic regression model was students who did not engage in the health risk behavior at hand. [b]Odds ratios are adjusted for gender and race/ethnicity.

For example, students who had used any prescription drug non-medically in their lifetime were approximately three times more likely to report lifetime steroid use; about seven times more likely to report lifetime marijuana and inhalant use; approximately eight times more likely to report heroin use; and close to nine times more likely to report lifetime cocaine use. In addition, they were about 20 times more likely to report lifetime ecstasy or methamphetamine use. Odds ratios illustrated that illicit substance use behaviors were similarly associated with past 30 day non-medical use of any prescription drug. These odds ratio values ranged from 5.0 for lifetime inhalant use to 20.4 for past 30 day marijuana use on school property.

Logistic regression analyses pertaining to illicit drug use were also conducted among the individual prescription drug classes— *pain relievers*, *depressants*, and *stimulants*. Results of these analyses are presented in Tables 15 through 17. Similar significant relationships between illicit substance use behaviors and each of the specific drug classes were also found. One exception was a non-significant relationship between the non-medical use of pain relievers and illicit steroid use at both the lifetime and 30-day prevalence intervals.

Table 15. Illicit Substance Use Behaviors Associated with Lifetime and Past 30-Day Non-Medical Use of Prescription *Pain Relievers*

Illicit substance use behaviors	Lifetime non-medical prescription pain reliever use			Past 30 day non-medical prescription pain reliever use		
	Use %	No use %	Adjusted OR [a,b] (95% CI)	Use %	No Use %	Adjusted OR [a,b] (95% CI)
Marijuana						
Lifetime use	72.6	26.8	7.0 (4.4, 11.1)***	75.0	34.8	5.4 (2.9, 10.3)***
Past 30 day use	45.2	8.4	8.7 (5.1, 14.9)***	62.5	12.5	11.5 (6.1, 21.4)***
Past 30 day on school property	10.5	1.6	6.8 (2.4, 19.7)***	17.9	2.1	9.9 (3.7, 26.6)***
Cocaine						
Lifetime use	22.9	3.9	9.3 (4.6, 18.8)***	31.5	7.7	5.5 (2.7, 11.0)***
Past 30 day use	14.8	2.3	7.3 (2.9, 18.1)***	18.5	4.0	5.6 (2.3, 13.4)***
Inhalants						
Lifetime use	26.2	5.8	5.6 (3.0, 10.4)***	31.5	8.8	4.7 (2.4, 9.3)***
Heroin						
Lifetime use	7.4	1.3	5.9 (1.8, 10.4)**	9.3	1.9	5.4 (1.6, 17.9)**
Methamphetamine						
Lifetime use	18.2	1.6	13.1 (4.8, 35.7)***	24.1	3.5	8.8 (3.8, 20.3)***
Ecstasy						
Lifetime use	33.1	3.3	14.6 (6.9, 30.5)***	44.4	6.7	11.2 (5.7, 22.2)***
Steroids						
Lifetime use	6.7	3.3	2.0 (0.8, 5.3)	7.4	3.5	2.2 (0.7, 7.1)

*P<0.05, **P<0.01, ***P<0.001. [a]The reference group for each logistic regression model was students who did not engage in the health risk behavior at hand. [b]Odds ratios are adjusted for gender and race/ethnicity.

Table 16. Illicit Substance Use Behaviors Associated with Lifetime and Past 30-Day Non-Medical Use of Prescription *Depressants*

Illicit substance use behaviors	Lifetime non-medical prescription depressant use			Past 30 day non-medical prescription depressant use		
	Use %	No use %	Adjusted OR [a,b] (95% CI)	Use %	No Use %	Adjusted OR [a,b] (95% CI)
Marijuana						
Lifetime use	87.3	33.0	13.7 (6.0, 31.1)***	80.0	36.8	6.8 (2.7, 17.2)***
Past 30 day use	63.6	12.4	12.4 (6.6, 23.5)***	80.0	14.2	26.2 (10.1,68.1)***
Past 30 day on school property	20.0	1.9	14.1 (5.1, 38.9)***	33.3	1.7	37.3 (11.7, 118.9)***
Cocaine						
Lifetime use	52.8	4.8	26.2 (12.2,56.4)***	58.6	7.3	23.6 (9.6, 58.3)***
Past 30 day use	26.4	2.9	13.8 (5.6, 33.8)***	41.4	3.3	36.9 (12.0, 114.0)***
Inhalants						
Lifetime use	39.6	7.7	8.2 (4.1, 16.1)***	34.5	10.0	5.1 (2.2, 12.0)***
Heroin						
Lifetime use	15.1	1.3	15.1 (4.6, 50.1)***	27.6	1.0	70.5 (15.9, 312.3)***
Methamphetamine						
Lifetime use	40.0	2.4	22.8 (9.3, 55.9)***	51.7	2.8	54.1 (18.4, 159.4)***
Ecstasy						
Lifetime use	59.3	4.8	32.8 (15.3,70.4)**	66.7	7.3	29.7 (12.2, 72.6)***
Steroids						
Lifetime use	11.5	3.1	4.4 (1.5, 12.7)***	17.9	3.0	10.1 (3.0, 34.3)***

*P<0.05, **P<0.01, ***P<0.001. [a]The reference group for each logistic regression model was students who did not engage in the health risk behavior at hand. [b]Odds ratios are adjusted for gender and race/ethnicity.

Table 17. Illicit Substance Use Behaviors Associated with Lifetime and Past 30-Day Non-Medical Use of Prescription *Stimulants*

Illicit substance use behaviors	Lifetime non-medical prescription stimulant use			Past 30 day non-medical prescription stimulant use		
	Use %	No use %	Adjusted OR [a,b] (95% CI)	Use %	No Use %	Adjusted OR [a,b] (95% CI)
Marijuana						
Lifetime use	89.7	34.8	15.9 (5.5, 45.7)***	95.7	36.8	36.9 (4.9, 276.4)***
Past 30 day use	59.0	14.7	8.2 (4.1, 16.4)***	73.9	15.7	14.9 (5.7, 39.4)***
Past 30 day on school property	18.0	2.5	8.2 (2.9, 23.3)***	21.7	2.9	9.2 (2.9, 29.4)***
Cocaine						
Lifetime use	47.4	7.1	11.9 (5.6, 25.3)***	45.5	8.8	8.9 (3.5, 22.4)***
Past 30 day use	26.3	3.8	9.1 (3.7, 22.7)***	31.8	4.4	11.8 (4.0, 34.3)***
Inhalants						
Lifetime use	42.1	8.7	7.5 (3.6, 15.8)***	45.5	9.8	7.9 (3.2, 19.6)***
Heroin						
Lifetime use	18.4	1.5	15.6 (4.8, 51.1)***	22.7	2.0	15.1 (4.3, 53.0)***
Methamphetamine						
Lifetime use	42.1	2.8	26.5 (10.7, 65.4)***	42.1	2.8	41.3 (14.8,115.2)***
Ecstasy						
Lifetime use	59.0	6.9	20.6 (9.5, 44.6)***	65.2	8.6	19.5 (7.7, 49.5)***
Steroids						
Lifetime use	16.2	3.1	6.5 (2.2, 19.0)***	27.3	3.0	13.1 (4.1, 41.7)***

*P<0.05, **P<0.01, ***P<0.001. [a]The reference group for each logistic regression model was students who did not engage in the health risk behavior at hand. [b]Odds ratios are adjusted for gender and race/ethnicity.

Research Question Two

Is there a relationship between tobacco use and non-medical prescription drug use among a sample of 12th grade students? Logistic regression was used to determine if the use of various tobacco products was significantly associated with non-medical prescription drug use. Both lifetime and past 30-day non-medical prescription drug use

were, for the most part, highly associated with the use of cigarettes, chewing tobacco, and cigars or cigarillos. As seen in Table 18, students who smoked cigarettes on school property had the highest odds of lifetime non-medical prescription drug use. They were almost 14 times more likely to have ever used prescription drugs non-medically and just over 15 times more likely to have done so in the past 30 days than their student counterparts who did not smoke at school. Significant relationships at the $\alpha = 0.001$ level were also seen between non-medical use of any prescription drug and lifetime cigarette use, past 30 day cigarette use, having ever been a regular smoker, past 30 day chewing tobacco use, and past 30 day cigar/cigarillo use. Having chewed tobacco on school property in the past 30 days was not associated with lifetime prescription drug use, however it was associated with past 30 day non-medical use of any prescription drug at the $\alpha = 0.05$ level.

As indicated in Tables 19 through 21, tobacco use behaviors were associated with lifetime and past 30 day non-medical prescription drug use among each of the three drug classes. According to the logistic regression analyses, a strong relationship exists between the use of cigarettes and prescription drugs in all three classes— pain relievers, depressants, and stimulants. For example, students who reported past 30 day cigarette use were approximately five times more likely to report past 30 day pain reliever use; they were 11 times more likely to report past 30 day stimulant use, and 13 times more likely to report past 30 day depressant use.

The use of cigars or cigarillos was also significantly associated with lifetime and past 30 day prescription drug use for all three drug classes. Past 30 day use of chewing tobacco was however, not consistently associated with all three drug classes. Although

the use of chewing tobacco was associated with both lifetime and past 30 day non-medical use of depressants, it was not consistently associated with the use of pain relievers and stimulants. Specifically, chewing tobacco was not associated with lifetime stimulant use nor was past 30 day chewing tobacco use on school property associated with lifetime pain reliever use. Chewing tobacco was only moderately associated with past 30 day stimulant and pain reliever use.

Table 18. Tobacco Use Behaviors associated with Lifetime and Past 30-Day Non-Medical Use of any Prescription Drug

	Lifetime non-medical prescription drug use			Past 30 day non-medical prescription drug use		
Tobacco use behaviors	Use %	No use %	Adjusted OR [a,b] (95% CI)	Use %	No Use %	Adjusted OR [a,b] (95% CI)
Cigarettes						
Lifetime use	80.7	39.0	6.4 (3.9, 10.4)***	80.6	46.7	4.6 (2.4, 8.8)***
Past 30 day use	50.7	16.3	5.3 (3.4, 8.4)***	58.0	21.3	5.1 (3.0, 8.8)***
Past 30 day on school property	12.3	1.0	13.6 (3.9, 47.2)***	20.3	1.7	15.4 (5.6, 42.2)***
Ever smoked regularly	39.1	10.2	5.6 (8.3, 9.3)***	44.9	14.4	4.8 (2.7, 8.3)***
Chewing tobacco						
Past 30 day use	15.2	4.4	4.0 (1.9, 8.5)***	18.8	5.8	3.8 (1.7, 8.5)***
Past 30 day on school property	6.5	3.1	2.1 (0.8, 5.6)	10.1	3.1	3.5 (1.3, 9.6)*
Cigars or cigarillos						
Past 30 day use	36.9	13.2	3.9 (2.4, 6.4)***	42.0	16.9	3.6 (2.0, 6.3)***

*P<0.05, **P<0.01, ***P<0.001. [a]The reference group for each logistic regression model was students who did not engage in the health risk behavior at hand. [b]Odds ratios are adjusted for gender and race/ethnicity.

Table 19. Tobacco Use Behaviors Associated with Lifetime and Past 30-Day Non-Medical Use of Prescription *Pain Relievers*

Tobacco use behaviors	Lifetime non-medical prescription drug use			Past 30 day non-medical prescription drug use		
	Use %	No use %	Adjusted OR [a,b] (95% CI)	Use %	No Use %	Adjusted OR [a,b] (95% CI)
Cigarettes						
Lifetime use	80.3	41.1	5.7 (3.4, 9.4)***	78.2	48.3	3.7 (1.9, 7.2)***
Past 30 day use	54.0	16.8	5.9 (3.7, 9.4)***	58.9	22.6	4.8 (2.7, 8.8)***
Past 30 day on school property	12.1	1.9	6.8 (2.6, 18.1)***	21.4	2.4	11.1 (4.4, 28.1)***
Ever smoked regularly	38.2	11.9	4.5 (2.7, 7.5)***	43.6	15.7	4.1 (2.2, 7.5)***
Chewing tobacco						
Past 30 day use	15.3	4.8	3.5 (1.7, 7.4)***	16.1	6.6	2.8 (1.1, 6.6)*
Past 30 day on school property	7.3	3.2	2.2 (0.9, 5.7)	10.7	3.5	3.4 (1.2, 9.5)*
Cigars or cigarillos						
Past 30 day use	38.7	13.9	3.9 (2.4, 6.4)***	42.9	17.8	3.5 (1.9, 6.5)***

*P<0.05, **P<0.01, ***P<0.001. [a]The reference group for each logistic regression model was students who did not engage in the health risk behavior at hand. [b]Odds ratios are adjusted for gender and race/ethnicity.

Table 20. Tobacco Use Behaviors Associated with Lifetime and Past 30-Day Non-Medical Use of Prescription *Depressants*

Tobacco use behaviors	Lifetime non-medical prescription drug use			Past 30 day non-medical prescription drug use		
	Use %	No use %	Adjusted OR [a,b] (95% CI)	Use %	No Use %	Adjusted OR [a,b] (95% CI)
Cigarettes						
Lifetime use	98.2	45.6	61.5 (8.4, 449.8)***	100.0	48.6	N/A[†]
Past 30 day use	72.7	20.8	10.0 (5.2, 19.1)***	80.0	23.1	13.0 (5.1, 32.7)***
Past 30 day on school property	21.8	2.4	11.7 (4.6, 29.6)***	33.3	2.5	20.7 (7.5, 57.2)***
Ever smoked regularly	57.4	14.0	8.1 (4.4, 14.9)***	70.0	15.4	12.5 (5.4, 28.8)***
Chewing tobacco						
Past 30 day use	20.0	6.1	4.6 (2.0, 10.8)***	16.7	7.2	3.6 (1.2, 11.2)*
Past 30 day on school property	12.7	3.2	5.0 (1.8, 14.0)**	16.7	3.2	9.0 (2.7, 30.6)***
Cigars or cigarillos						
Past 30 day use	43.6	17.7	3.9 (2.1, 7.3)***	46.7	18.9	4.5 (2.0, 10.0)***

*P<0.05, **P<0.01, ***P<0.001. [a]The reference group for each logistic regression model was students who did not engage in the health risk behavior at hand. [b]Odds ratios are adjusted for gender and race/ethnicity. [†] Unable to obtain odds ratio due to 100% lifetime prevalence value.

Table 21. Tobacco Use Behaviors Associated with Lifetime and Past 30-Day Non-Medical Use of Prescription *Stimulants*

Tobacco use behaviors	Lifetime non-medical prescription drug use			Past 30 day non-medical prescription drug use		
	Use %	No use %	Adjusted OR [a,b] (95% CI)	Use %	No Use %	Adjusted OR [a,b] (95% CI)
Cigarettes						
Lifetime use	89.2	48.6	8.5 (3.0, 24.5)***	95.4	49.8	20.5 (2.7, 154.2)**
Past 30 day use	59.0	24.1	4.5 (2.3, 9.0)***	78.3	24.5	11.0 (4.0, 30.5)***
Past 30 day on school property	23.1	2.8	10.8 (4.0, 28.5)***	34.8	2.9	17.0 (6.0, 48.0)***
Ever smoked regularly	64.1	15.0	10.0 (4.9, 20.5)***	73.9	16.4	15.0 (5.6, 40.1)***
Chewing tobacco						
Past 30 day use	15.4	7.1	2.3 (0.8, 6.2)	21.7	7.1	4.2 (1.3, 13.4)*
Past 30 day on school property	10.3	3.6	3.0 (0.9, 9.9)	13.0	3.7	4.3 (1.1, 17.0)*
Cigars or cigarillos						
Past 30 day use	38.5	19.0	2.6 (1.3, 5.3)**	47.8	19.4	4.1 (1.7, 10.0)**

*P<0.05, **P<0.01, ***P<0.001. [a]The reference group for each logistic regression model was students who did not engage in the health risk behavior at hand. [b]Odds ratios are adjusted for gender and race/ethnicity.

Research Question Three

Is there a relationship between alcohol use and non-medical prescription drug use among a sample of 12th grade students? As illustrated in Table 22, non-medical use of any prescription drug was highly related to alcohol use behaviors including those involving underage drinking, binge drinking, driving a car under the influence of alcohol, and riding in a car with a driver who had been drinking.

Table 22. Alcohol Use Behaviors Associated with Lifetime and Past 30-Day Non-Medical Use of any Prescription Drug

	Lifetime non-medical prescription drug use			Past 30 day non-medical prescription drug use		
Alcohol use behaviors	Use %	No use %	Adjusted OR [a,b] (95% CI)	Use %	No Use %	Adjusted OR [a,b] (95% CI)
Alcohol						
Lifetime use	93.5	67.5	7.2 (3.5, 14.8)***	91.3	73.1	3.9 (1.6, 9.4)**
Past 30 day use	74.6	44.1	4.0 (2.5, 6.5)***	82.6	48.5	5.4 (2.8, 10.4)***
Past 30 day binge	63.0	23.4	5.8 (3.7, 9.1)***	71.0	29.4	6.0 (3.4, 10.5)***
Past 30 day use on school property	9.4	1.4	7.4 (2.4, 23.4)***	15.9	1.7	11.3 (4.0, 32.1)***
Alcohol and driving						
Riding in a car after alcohol use	51.1	19.1	4.6 (2.9, 7.3)***	59.4	23.4	4.9 (2.9, 8.5)***
Driving a car after alcohol use	43.8	15.3	4.3 (2.6, 6.9)***	49.3	19.7	3.9 (2.3, 6.7)***

*P<0.05, **P<0.01, ***P<0.001. [a]The reference group for each logistic regression model was students who did not engage the health risk behavior at hand. [b]Odds ratios are adjusted for gender and race/ethnicity.

For example, students who reported lifetime alcohol use were 7.2 times more likely to report lifetime use of any prescription drug. Students who reported past 30 day alcohol use were six times more likely to report past 30 day use of any prescription drug; those reporting alcohol use on school property in the past month were more than 11 times more likely to use prescription drugs. The acts of riding in or driving a car after alcohol use were also significantly associated with non-medical prescription drug use, increasing a person's odds about 4 to 5 times.

Tables 23-25 provide a summary of alcohol use behaviors associated with lifetime and past 30 day use of prescription drugs by drug class. According to the analyses, every alcohol related behavior was significantly associated with each class of prescription drug, for both lifetime and past 30 day prevalence estimates.

Table 23. Alcohol Use Behaviors Associated with Lifetime and Past 30-Day Non-Medical Use of Prescription *Pain Relievers*

Alcohol use behaviors	Lifetime non-medical prescription drug use			Past 30 day non-medical prescription drug use		
	Use %	No use %	Adjusted OR [a,b] (95% CI)	Use %	No Use %	Adjusted OR [a,b] (95% CI)
Alcohol						
Lifetime use	96.0	67.7	12.0 (4.7, 30.5)***	94.6	72.9	6.8 (2.1, 22.2)**
Past 30 day use	75.0	45.5	3.9 (2.4, 6.3) ***	87.5	48.8	7.9 (3.4, 17.9)***
Past 30 day binge	62.3	25.8	4.7 (3.0, 7.4)***	67.9	31.0	4.8 (2.6, 8.8)***
Past 30 day use on school property	10.5	1.6	6.9 (2.3, 19.8)***	16.1	2.4	7.8 (2.9, 21.1)***
Alcohol and driving						
Riding in a car after alcohol use	52.9	20.1	4.7 (3.0, 7.5)***	60.7	24.5	4.9 (2.7, 8.9)***
Driving a car after alcohol use	45.5	16.1	4.3 (2.7, 6.9)***	51.8	20.5	4.1 (2.3, 7.4)***

*P<0.05, **P<0.01, ***P<0.001. [a]The reference group for each logistic regression model was students who did not engage the health risk behavior at hand. [b]Odds ratios are adjusted for gender and race/ethnicity.

Table 24. Alcohol Use Behaviors Associated with Lifetime and Past 30-Day Non-Medical Use of Prescription *Depressants*

Alcohol use behaviors	Lifetime non-medical prescription drug use			Past 30 day non-medical prescription drug use		
	Use %	No use %	Adjusted OR [a,b] (95% CI)	Use %	No Use %	Adjusted OR [a,b] (95% CI)
Alcohol						
Lifetime use	98.2	72.6	20.5 (2.8, 150.7)**	93.3	74.4	4.6 (1.1, 19.8)*
Past 30 day use	83.6	49.6	5.3 (2.5, 11.3)***	86.7	51.2	6.0 (2.1, 17.7)**
Past 30 day binge	63.6	31.9	3.8 (2.1, 6.9)***	70.0	33.3	4.8 (2.1, 10.8)***
Past 30 day use on school property	20.0	1.9	14.9 (5.3, 41.7)***	20.0	2.7	11.2 (3.6, 34.8)***
Alcohol and driving						
Riding in a car after alcohol use	69.1	23.6	7.3 (3.9, 13.6)***	83.3	25.0	14.6 (5.4, 39.4)***
Driving a car after alcohol use	54.5	20.1	4.8 (2.7, 8.7)***	56.7	22.0	4.9 (2.3, 10.5)***

*P<0.05, **P<0.01, ***P<0.001. [a]The reference group for each logistic regression model was students who did not engage the health risk behavior at hand. [b]Odds ratios are adjusted for gender and race/ethnicity.

Table 25. Alcohol Use Behaviors Associated with Lifetime and Past 30-Day Non-Medical Use Prescription *Stimulants*

Alcohol use behaviors	Lifetime non-medical prescription drug use			Past 30 day non-medical prescription drug use		
	Use %	No use %	Adjusted OR [a,b] (95% CI)	Use %	No Use %	Adjusted OR [a,b] (95% CI)
Alcohol						
Lifetime use	92.3	74.1	4.2 (1.3, 14.1)*	95.7	75.0	7.7 (1.0, 58.1)*
Past 30 day use	87.2	50.5	7.0 (2.7, 18.5)***	87.0	52.2	6.5 (1.9, 22.5)**
Past 30 day binge	82.1	31.5	10.0 (4.3, 23.5)***	82.6	33.6	9.7 (3.2, 29.2)***
Past 30 day use on school property	20.5	2.3	11.3 (4.0, 31.9)***	17.4	3.2	6.4 (1.9, 21.9)**
Alcohol and driving						
Riding in a car after alcohol use	66.7	25.5	6.0 (2.9, 12.2)***	73.9	26.9	8.1 (3.1, 21.3)***
Driving a car after alcohol use	56.4	21.2	4.8 (2.4, 9.4)***	56.5	22.6	4.4 (1.9, 10.5)***

*P<0.05, **P<0.01, ***P<0.001. [a]The reference group for each logistic regression model was students who did not engage the health risk behavior at hand. [b]Odds ratios are adjusted for gender and race/ethnicity.

Research Question Four

Is there a relationship between sexual risk behaviors and non-medical prescription drug use among a sample of 12th grade students? Logistic regression was also used to determine the relationship between sexual risk behaviors and non-medical use of prescription drugs. The sexual risk behaviors that were investigated included ever having sexual intercourse; and for those students who had engaged in intercourse, behaviors relating to number of sexual partners, substance use during sex, and condom use during sex were also assessed.

As illustrated in Table 26, selected sexual risk behaviors were significantly associated with use of any prescription drug. Students who had ever engaged in sexual intercourse for example, were about 4 times more likely to report lifetime prescription drug use and approximately 5 times more likely to report past 30 day non-medical prescription drug use. Drinking alcohol or using drugs at last sexual intercourse was also significantly associated with both lifetime and past 30 day prescription drug use. The behavior of more than 3 lifetime partners was significantly associated with lifetime prescription drug use; having more than 3 partners in the past 30 days was significantly associated with past 30 day non-medical use of prescription drugs. The reference group of three or more sexual partners was chosen for the analyses because this has shown to be a significant correlate of multiple risk behaviors in previous research (Valois, Oeltman, Waller, & Hussey, 1999)

Table 26. Sexual Risk Behaviors Associated with Lifetime and Past 30-Day Non-Medical Use of any Prescription Drug

Sexual risk behaviors	Lifetime non-medical prescription drug use			Past 30 day non-medical prescription drug use		
	Use %	No use %	Adjusted OR [a,b] (95% CI)	Use %	No Use %	Adjusted OR [a,b] (95% CI)
Sexual intercourse						
Ever had sexual intercourse	78.2	49.7	3.7 (2.3, 6.0)***	84.9	53.9	4.9 (2.4, 9.9)***
More than 3 lifetime partners[#]	60.0	42.7	2.0 (1.2, 3.3)*	57.9	47.8	1.5 (0.8, 2.7)
Sexual intercourse in past 3 months[#]	77.4	75.9	1.2 (0.6, 2.2)	83.9	74.2	2.1 (0.9, 4.8)
More than 3 partners in past 3 months[#]	19.1	11.0	2.0 (0.9, 4.1)	25.0	11.3	2.7 (1.3, 5.8)*
Substance use						
Drank alcohol or used drugs before last sexual intercourse[#]	45.6	26.2	2.4 (1.4, 4.1)**	54.7	28.7	3.0 (1.6, 5.6)***
Condom use						
No condom use at last sexual intercourse[#]	48.5	46.4	1.1 (0.6, 1.8)	44.2	48.2	0.9 (0.5, 1.6)

*P<0.05, **P<0.01, ***P<0.001. [a]The reference group for each logistic regression model was students who did not engage in the health risk behavior at hand. [b]Odds ratios are adjusted for gender and race/ethnicity. [#]Includes only students who engaged in sexual intercourse.

Tables 27-29 illustrate the result of regression analyses of sexual risk behaviors by specific prescription drug class. For pain relievers, the strongest relationship was found between students who had ever had intercourse and past 30 day non-medical use of the drugs, followed by lifetime use. Substance use, before last sexual intercourse was also associated with both prevalence estimates of pain reliever use. Other significant

relationships for pain relievers included: having more than three lifetime sexual partners and lifetime prevalence; having sexual intercourse in the past three months and past month use; and having more than three sexual partners in the past three months and both lifetime and past 30 day pain reliever prevalence. Somewhat similar relationships were also found between sexual risk behaviors and the non-medical use of depressants. One additional significant relationship was that between past 30 day use of depressants and having more than three lifetime sexual partners.

The use of prescription stimulants was less likely to be associated with sexual risk behaviors. Like pain relievers and depressants, significant relationships existed between having ever had sexual intercourse and both lifetime and past 30 day use of the drugs. Having more than three sexual partners was also a significant correlate of past month prescription stimulant use.

Table 27. Sexual Risk Behaviors Associated with Lifetime and Past 30-Day Non-Medical Use of Prescription *Pain Relievers*

Sexual risk behaviors	Lifetime non-medical prescription drug use			Past 30 day non-medical prescription drug use		
	Use %	No use %	Adjusted OR [a,b] (95% CI)	Use %	No Use %	Adjusted OR [a,b] (95% CI)
Sexual intercourse						
Ever had sexual intercourse	79.2	50.5	3.8 (2.3, 6.3)***	87.3	54.5	5.8 (2.6, 13.2)***
More than 3 lifetime partners[#]	61.7	42.9	2.1 (1.2, 3.6)**	61.7	47.4	1.8 (0.9, 3.4)
Sexual intercourse in past 3 months[#]	77.7	75.7	1.2 (0.7 , 2.3)	87.0	74.0	2.6 (1.0, 6.7)*
More than 3 partners in past 3 months[#]	21.3	10.1	2.5 (1.2, 5.2)*	23.9	12.2	2.3 (1.0, 5.2)*
Substance use						
Drank alcohol or used drugs before last sexual intercourse[#]	47.3	26.5	2.5 (1.5, 4.4)***	56.8	29.4	3.2 (1.6, 6.2)***
Condom use						
No condom use at last sexual intercourse[#]	45.7	48.3	0.9 (0.5, 1.5)	42.2	48.5	0.8 (0.4, 1.5)

*P<0.05, **P<0.01, ***P<0.001. [a]The reference group for each logistic regression model was students who did not engage in the health risk behavior at hand. [b]Odds ratios are adjusted for gender and race/ethnicity. [#]Includes only students who engaged in sexual intercourse.

Table 28. Sexual Risk Behaviors Associated with Lifetime and Past 30-Day Non-Medical Use of Prescription *Depressants*

Sexual risk behaviors	Lifetime non-medical prescription drug use			Past 30 day non-medical prescription drug use		
	Use %	No use %	Adjusted OR [a,b] (95% CI)	Use %	No Use %	Adjusted OR [a,b] (95% CI)
Sexual intercourse						
Ever had sexual intercourse	81.1	55.4	3.5 (1.7, 7.3)***	82.1	57.1	3.6 (1.3, 9.6)*
More than 3 lifetime partners[#]	78.1	44.5	4.4 (2.0, 9.8)***	78.3	47.3	3.9 (1.4, 11.0)**
Sexual intercourse in past 3 months[#]	85.4	74.6	2.0 (0.8, 5.2)	95.5	74.6	6.8 (0.9, 52.6)
More than 3 partners in past 3 months[#]	36.6	10.0	5.5 (2.5, 12.2)***	40.9	11.8	5.5 (2.1, 14.2)***
Substance use						
Drank alcohol or used drugs before last sexual intercourse[#]	61.9	28.6	4.1 (2.1, 8.3)***	60.0	32.0	3.5 (1.4, 9.0)*
Condom use						
No condom use at last sexual intercourse[#]	46.2	47.5	0.9 (0.5, 1.8)	42.9	47.7	0.7 (0.3, 1.9)

*P<0.05, **P<0.01, ***P<0.001. [a]The reference group for each logistic regression model was students who did not engage in the health risk behavior at hand. [b]Odds ratios are adjusted for gender and race/ethnicity. [#]Includes only students who engaged in sexual intercourse.

Table 29. Sexual Risk Behaviors Associated with Lifetime and Past 30-Day Non-Medical Use of Prescription *Stimulants*

Sexual risk behaviors	Lifetime non-medical prescription drug use			Past 30 day non-medical prescription drug use		
	Use %	No use %	Adjusted OR [a,b] (95% CI)	Use %	No Use %	Adjusted OR [a,b] (95% CI)
Sexual intercourse						
Ever had sexual intercourse	91.7	55.6	9.0 (2.7, 29.8)***	90.9	56.9	7.7 (1.8, 33.5)**
More than 3 lifetime partners[#]	63.6	48.1	1.8 (0.9, 4.0)	70.0	48.4	2.4 (0.9, 6.5)
Sexual intercourse in past 3 months[#]	87.9	74.6	2.6 (0.9, 7.9)	89.5	75.3	3.0 (0.7, 13.6)
More than 3 partners in past 3 months[#]	24.2	12.9	2.2 (0.9, 5.4)	31.6	13.0	3.1 (1.1, 8.9)*
Substance use						
Drank alcohol or used drugs before last sexual intercourse[#]	43.8	32.9	1.6 (0.8, 3.4)	42.1	33.6	1.4 (0.6, 3.7)
Condom use						
No condom use at last sexual intercourse[#]	64.5	44.8	2.2 (1.0, 4.9)*	46.4	57.8	1.6 (0.6, 4.4)

*P<0.05, **P<0.01, ***P<0.001. [a]The reference group for each logistic regression model was students who did not engage in the health risk behavior at hand. [b]Odds ratios are adjusted for gender and race/ethnicity. [#]Includes only students who engaged in sexual intercourse.

Research Question Five

Is there a relationship between violence-related behaviors and non-medical prescription drug use among a sample of 12th grade students? Table 30 provides the odds ratios, confidence intervals and p-values, as a result of the logistic regression analyses of various violence related behaviors. These behaviors were classified into three categories: weapon carrying, feeling threatened or unsafe, and assault. Weapon carrying was assessed using three items: carrying any weapon during the past 30 days; carrying a gun in the past 30 days; and carrying any weapon to school during the past 30 days. Feeling threatened or unsafe was addressed by three items as well: missing school in the past 30 days attributed to feeling unsafe; being threatened or injured with a weapon in the past year at school; and having property stolen or damaged in the past year at school. Assault was assessed using five items: being involved in one or more fighting incident during the past year; being injured during a fight in the past year; fighting on school property in the past year; being hit, slapped, or hurt by a boyfriend/girlfriend in the past year; and ever being forced to have sexual intercourse. All of the weapon carrying behaviors were significantly associated with lifetime and past 30 day non-medical use of any prescription drug. Of the three behaviors related to feeling unsafe or being threatened, missing school was significantly associated with past 30 day use of any prescription drug, being threatened/injured with a weapon at school was associated with lifetime prescription drug use, and having one's property stolen or damaged was significantly associated with both lifetime and past 30 day non-medical use of prescription drugs. Of the assault-related behaviors, fighting, being injured fighting, and being hurt by a boyfriend/girlfriend were all associated with both lifetime and past 30 day

use. Ever being forced to have sex was significantly associated with past 30 day non-medical prescription drug use but not lifetime use.

Tables 31-33 present the results of the logistic regression analyses when differentiated by drug class. For the most part, weapon carrying behaviors significantly increased odds of non-medical pain reliever, depressant, and stimulant use. Behaviors related to feeling unsafe or being threatened at school where most associated with depressant use however. For example, students who reported missing school because they felt unsafe were 16 times more likely to use depressants non-medically than students who did not miss school. Most behaviors related to assault were also significantly associated with both lifetime and past 30 day use of each of the three classes of drugs. All of the assault-related behaviors were associated with lifetime and past 30 day use of both pain relievers and depressants with the exception of fighting on school property which was significantly correlated with past 30 day use in the two drug classes. Among the assault behaviors, those significantly associated with lifetime and past 30 day stimulant use were fighting and being injured fighting. Forced sexual activity was also a correlate of past 30 day non-medical stimulant use.

Table 30. Violence-Related Behaviors Associated with Lifetime and Past 30-Day Non-Medical Use of any Prescription Drug

Violence related behaviors	Lifetime non-medical prescription drug use			Past 30 day non-medical prescription drug use		
	Use %	No use %	Adjusted OR [a,b] (95% CI)	Use %	No Use %	Adjusted OR [a,b] (95% CI)
Weapon carrying						
Any weapon in past 30 days	25.4	11.9	2.7 (1.5, 4.5)***	33.3	13.0	3.7 (1.9, 7.1)***
Gun in past 30 days	11.6	5.1	2.4 (1.1, 5.2)*	17.4	5.3	4.0 (1.7, 9.0)**
Any weapon on school property in past 30 days	14.5	3.1	5.6 (2.4, 12.9)***	18.8	4.2	5.7 (2.5, 13.1)***
Felt threatened or unsafe						
Missed school because felt unsafe in past 30 days	5.8	2.0	2.9 (1.0, 8.5)	10.1	1.9	5.6 (1.9, 16.7)**
Threatened or injured with a weapon in past year at school	10.1	4.4	2.4 (1.1, 2.8)*	10.1	5.3	2.0 (0.8, 5.0)
Stolen/damaged property in past year at school	30.4	20.0	1.8 (1.1, 2.8)*	37.7	20.8	2.3 (1.3, 4.1)**
Assault						
Fought in past year	39.1	13.9	4.3 (2.6, 7.0)***	47.8	16.9	4.9 (2.7, 8.7)***
Injured fighting in past year	9.5	1.7	5.9 (2.1, 17.1)**	11.8	2.5	5.1 (1.9, 14.0)**
Fought on school property in past year	10.9	5.8	1.9 (0.9, 4.0)	13.0	6.4	2.2 (0.9, 5.0)
Boyfriend or girlfriend hit, slapped, or hurt you in past year	32.6	18.0	2.2 (1.4, 3.5)**	43.5	18.6	3.3 (1.9, 5.8)***
Ever forced to have intercourse	17.5	11.9	1.6 (0.9, 2.8)	25.0	11.6	2.6 (1.4, 4.9)**

*P<0.05, **P<0.01, ***P<0.001. [a]The reference group for each logistic regression model was students who did not engage in the health risk behavior at hand. [b]Odds ratios are adjusted for gender and race/ethnicity.

Table 31. Violence-Related Behaviors Associated with Lifetime and Past 30-Day Non-Medical Use of Prescription *Pain Relievers*

Violence related behaviors	Lifetime non-medical prescription drug use			Past 30 day non-medical prescription drug use		
	Use %	No use %	Adjusted OR [a,b] (95% CI)	Use %	No Use %	Adjusted OR [a,b] (95% CI)
Weapon carrying						
Any weapon in past 30 days	25.8	12.6	2.4 (1.4, 4.2)**	32.1	14.1	3.2 (1.6, 6.4)**
Gun in past 30 days	11.3	5.8	2.0 (0.9, 4.2)	17.9	5.8	3.7 (1.6, 8.8)**
Any weapon on school property in past 30 days	14.5	3.9	4.2 (1.9, 9.1)***	19.6	4.8	5.2 (2.2, 12.2)***
Felt threatened or unsafe						
Missed school because felt unsafe in past 30 days	5.7	2.3	2.4 (0.8, 7.1)	7.1	2.7	2.7 (0.8, 9.1)
Threatened or injured with a weapon in past year at school	10.5	4.8	2.2 (1.0, 4.8)	12.5	5.3	2.5 (1.0, 6.5)
Stolen/damaged property in past year at school	29.8	21.0	1.5 (1.0, 2.6)	39.3	21.2	2.4 (1.3, 4.4)**
Assault						
Fought in past year	40.3	14.8	4.2 (2.4, 6.6)***	48.2	18.0	4.6 (2.5, 8.5)***
Injured fighting in past year	8.9	2.3	4.1 (1.5, 10.8)**	10.9	2.9	4.1 (1.4, 11.7)**
Fought on school property in past year	10.5	6.1	1.7 (0.8, 3.6)	14.3	6.4	2.4 (1.0, 5.7)*
Boyfriend or girlfriend hit, slapped, or hurt you in past year	33.9	18.5	2.2 (1.4, 3.6)***	44.6	19.4	3.3 (1.8, 6.0)***
Ever forced to have intercourse	19.4	11.7	1.8 (1.0, 3.2)*	26.8	12.0	2.7 (1.4, 5.3)**

*P<0.05, **P<0.01, ***P<0.001. [a]The reference group for each logistic regression model was students who did not engage in the health risk behavior at hand. [b]Odds ratios are adjusted for gender and race/ethnicity.

Table 32. Violence-Related Behaviors Associated with Lifetime and Past 30-Day Non-Medical Use of Prescription *Depressants*

Violence related behaviors	Lifetime non-medical prescription drug use			Past 30 day non-medical prescription drug use		
	Use %	No use %	Adjusted OR [a,b] (95% CI)	Use %	No Use %	Adjusted OR [a,b] (95% CI)
Weapon carrying						
Any weapon in past 30 days	36.4	13.5	4.9 (2.4, 10.1)***	40.0	14.4	7.3 (2.8, 18.9)***
Gun in past 30 days	16.4	6.1	3.6 (1.5, 8.7)**	20.0	6.2	6.2 (2.0, 19.2)**
Any weapon on school property in past 30 days	18.2	5.3	4.6 (1.9, 11.1)***	20.0	5.5	6.4 (2.1, 19.1)***
Felt threatened or unsafe						
Missed school because felt unsafe in past 30 days	7.3	2.6	3.0 (0.9, 9.9)	20.0	2.0	16.0 (4.8, 53.3)***
Threatened or injured with a weapon in past year	14.6	5.3	3.4 (1.4, 8.5)**	13.3	5.5	3.6 (1.1, 12.1)*
Stolen/damaged property in past year at school	32.7	22.2	1.8 (0.9, 3.3)	43.3	21.9	3.0 (1.4, 6.5)**
Physical fighting						
Fought in past year	49.1	18.2	5.1 (2.7, 9.6)***	56.7	19.2	7.9 (3.4, 18.3)***
Injured fighting in past year	10.9	3.2	3.9 (1.4, 10.9)*	20.0	2.7	11.5 (3.6, 36.5)***
Fought on school property in past year	9.1	7.1	1.3 (0.5, 3.6)	20.0	6.5	4.4 (1.6, 12.2)**
Boyfriend or girlfriend hit, slapped, or hurt you in past year	43.6	19.8	3.1 (1.7, 5.7)***	63.3	19.5	7.4 (3.3, 16.2)***
Forced to have intercourse	23.6	12.4	2.2 (1.1, 4.4)*	34.5	12.2	3.9 (1.7, 9.0)**

*P<0.05, **P<0.01, ***P<0.001. [a]The reference group for each logistic regression model was students who did not engage in the health risk behavior at hand. [b]Odds ratios are adjusted for gender and race/ethnicity.

Table 33. Violence-Related Behaviors Associated with Lifetime and Past 30-Day Non-Medical Use of Prescription *Stimulants*

Violence related behaviors	Lifetime non-medical prescription drug use			Past 30 day non-medical prescription drug use		
	Use %	No use %	Adjusted OR [a,b] (95% CI)	Use %	No Use %	Adjusted OR [a,b] (95% CI)
Weapon carrying						
Any weapon in past 30 days	35.9	14.2	3.8 (1.7, 8.4)**	39.1	15.0	4.4 (1.6, 11.9)**
Gun in past 30 days	23.1	5.6	5.6 (2.2, 14.4)***	30.4	5.9	9.1 (2.9, 28.3)***
Any weapon on school property in past 30 days	18.0	5.6	3.9 (1.4, 10.3)**	26.1	5.6	6.4 (2.1, 19.0)***
Felt threatened or unsafe						
Missed school because felt unsafe in past 30 days	10.3	2.5	4.3 (1.3, 14.6)*	8.7	2.9	3.1 (0.6, 14.8)
Threatened or injured with a weapon in past year at school	7.7	6.1	1.2 (0.3, 4.4)	13.0	5.9	2.4 (0.6, 8.9)
Stolen/damaged property in past year at school	35.9	22.1	2.0 (1.0, 4.0)	39.1	22.6	2.2 (0.9, 5.3)
Physical fighting						
Fought in past year	46.2	19.5	3.7 (1.8, 7.6) ***	47.8	20.6	3.7 (1.5, 9.1)**
Injured fighting in past year	12.8	3.3	4.2 (1.4, 12.5)*	17.4	3.4	6.0 (1.8, 20.6)**
Fought on school property in past year	15.4	6.6	2.6 (1.0, 6.8)	8.7	7.4	1.1 (0.3, 5.2)
Boyfriend or girlfriend hit, slapped, or hurt you in past year	28.2	22.1	1.4 (0.7, 2.9)	34.8	22.1	1.9 (0.8, 4.6)
Ever forced to have intercourse	21.1	12.9	1.8 (0.8, 4.3)	30.4	12.8	2.9 (1.1, 7.4)*

*P<0.05, **P<0.01, ***P<0.001. [a]The reference group for each logistic regression model was students who did not engage in the health risk behavior at hand. [b]Odds ratios are adjusted for gender and race/ethnicity.

Research Question Six

Is there a relationship between depression and suicide ideation and non-medical prescription drug use among a sample of 12th grade students? Logistic regression was also used to assess the association between non-medical use of any prescription drug and selected behaviors that were indicators of depression and suicide ideation including: feeling of depression in the past year; a planned or attempted suicide in the past year, or sustaining an injury resulting from an attempt in the past year.

As Table 34 illustrates, adjusted odds ratios for the regression models show a relationship between selected behaviors related to depression and suicide and use of any prescription drug. Those behaviors associated with lifetime non-medical use of prescription drugs were having feelings of depression in the past 30 days, and having planned an attempt in the past year. Those behaviors associated with past 30 day prevalence were having feelings of depression in the past 30 days; and having considered, planned, or attempted suicide in the past year.

Tables 35-37 represent the results of logistic regression analyses of depression and suicide ideation by drug class. For pain relievers, significant relationships existed at the $\alpha = 0.05$ or 0.01 level and mirrored many of the same associations found for the composite value of use of any prescription drug. One significant relationship was unique to pain relievers; the association between feelings of depression in the past year and lifetime use of pain relievers.

Relationships were demonstrated between feelings of depression and both lifetime and past 30 day prevalence of prescription depressant use. All four reported suicide behaviors were associated with past 30 day non-medical use of depressants; a planned attempt in the past year was additionally associated with lifetime depressant use. For

stimulants on the other hand, feelings of depression or consideration of a suicide attempt were not significant correlates of prescription drug use from that class. A planned attempt, or injury sustained during a planned attempt however, were significantly associated with lifetime and past 30 day non-medical use of stimulants. For example, students who were injured in a suicide attempt during the previous year were almost 16 times more likely to use prescription stimulant than those who had not reported an attempt-related injury.

Table 34. Feelings of Depression and Suicide Ideation Associated with Lifetime and Past 30-Day Non-Medical Use of any Prescription Drug

	Lifetime non-medical prescription drug use			Past 30 day non-medical prescription drug use		
Depression and suicide ideation	Use %	No use %	Adjusted OR [a,b] (95% CI)	Use %	No Use %	Adjusted OR [a,b] (95% CI)
Depression						
Feelings during the past 12 months	32.9	21.0	1.8 (1.1, 2.8)*	43.3	21.4	2.8 (1.6, 4.8)***
Suicide						
Considered an attempt in past 12 months	17.4	11.5	1.6 (0.9, 2.9)	21.7	11.9	2.1 (1.1, 4.1)*
Planned to attempt in past 12 months	16.1	7.8	2.2 (1.2, 4.2)*	22.1	8.3	3.2 (1.6, 6.3)**
Attempted in past 12 months	16.0	12.5	1.4 (0.8, 2.5)	23.2	11.7	2.4 (1.2, 4.6)**
Injured in an attempt in past 12 months	8.0	3.0	2.2 (0.7, 6.6)	10.1	3.3	1.6 (0.5, 5.4)

*P<0.05, **P<0.01, ***P<0.001. [a]The reference group for each logistic regression model was students who did not engage in the health risk behavior at hand. [b]Odds ratios are adjusted for gender and race/ethnicity.

Table 35. Feelings of Depression and Suicide Ideation Associated with Lifetime and Past 30-Day Non-Medical Use of Prescription *Pain Relievers*

Depression and suicide ideation	Lifetime non-medical prescription drug use			Past 30 day non-medical prescription drug use		
	Use %	No use %	Adjusted OR [a,b] (95% CI)	Use %	No Use %	Adjusted OR [a,b] (95% CI)
Depression						
Feelings during the past 12 months	32.5	21.6	1.7 (1.1, 2.7)*	42.9	22.1	2.6 (1.4, 4.6)**
Suicide						
Considered an attempt in past 12 months	18.6	11.3	1.8 (1.0, 3.2)*	23.2	11.9	2.3 (1.1, 4.6)*
Planned to attempt in past 12 months	17.1	8.1	2.3 (1.2, 4.3)**	21.8	9.0	2.8 (1.3, 5.9)**
Attempted in past 12 months	16.3	12.6	1.4 (0.8, 2.5)	23.2	12.0	2.3 (1.1, 4.6)*
Injured in an attempt in past 12 months	7.3	3.6	1.4 (0.5, 4.1)	8.9	3.7	1.1 (0.3, 1.7)

*P<0.05, **P<0.01, ***P<0.001. [a]The reference group for each logistic regression model was students who did not engage in the health risk behavior at hand. [b]Odds ratios are adjusted for gender and race/ethnicity.

Table 36. Feelings of Depression and Suicide Ideation Associated with Lifetime and Past 30-Day Non-Medical Use of Prescription *Depressants*

Depression and suicide ideation	Lifetime non-medical prescription drug use			Past 30 day non-medical prescription drug use		
	Use %	No use %	Adjusted OR [a,b] (95% CI)	Use %	No Use %	Adjusted OR [a,b] (95% CI)
Depression						
Feelings during the past 12 months	38.2	22.8	2.1 (1.1, 3.7)*	60.0	22.2	5.3 (2.5, 11.6)***
Suicide						
Considered an attempt in past 12 months	20.0	12.4	1.8 (0.9, 3.7)	26.7	12.4	2.7 (1.1, 6.4)*
Planned to attempt in past 12 months	21.8	9.0	2.7 (1.3, 5.8)**	36.7	8.5	6.3 (2.8, 14.6)***
Attempted in past 12 months	18.2	13.0	1.5 (0.7, 3.2)	30.0	12.2	3.1 (1.3, 7.3)***
Injured in an attempt in past 12 months	10.9	3.7	2.0 (0.6, 7.1)	20.0	3.2	3.1 (0.8, 12.2)**

*P<0.05, **P<0.01, ***P<0.001. [a]The reference group for each logistic regression model was students who did not engage in the health risk behavior at hand. [b]Odds ratios are adjusted for gender and race/ethnicity.

Table 37. Feelings of Depression and Suicide Ideation Associated with Lifetime and Past 30-Day Non-Medical Use of any Prescription *Stimulants*

Depression and suicide ideation	Lifetime non-medical prescription drug use			Past 30 day non-medical prescription drug use		
	Use %	No use %	Adjusted OR [a,b] (95% CI)	Use %	No Use %	Adjusted OR [a,b] (95% CI)
Depression						
Feelings during the past 12 months	35.6	23.7	1.8 (0.9, 3.6)	34.8	24.3	1.5 (0.7, 3.9)
Suicide						
Considered an attempt in past 12 months	23.1	12.4	2.2 (1.0, 5.0)	26.1	12.8	2.3 (0.9, 6.3)
Planned to attempt in past 12 months	25.6	8.9	3.6 (1.6, 8.0)**	34.8	9.1	5.1 (2.0, 13.0)***
Attempted in past 12 months	20.5	13.0	1.8 (0.8, 4.2)	30.4	12.8	3.0 (1.2, 7.7)*
Injured in an attempt in past 12 months	15.4	3.6	5.3 (1.1, 24.1)**	26.1	3.4	15.9 (1.7, 143.9)***

*P<0.05, **P<0.01, ***P<0.001. [a]The reference group for each logistic regression model was students who did not engage in the health risk behavior at hand. [b]Odds ratios are adjusted for gender and race/ethnicity.

Research Question Seven

Is there a relationship between decreased physical activity and non-medical prescription drug use among a sample of 12th grade students? According to the results of multiple logistic regression analyses found in Table 38, indicators of decreased physical activity were generally not associated with lifetime or past 30 day prevalence of any prescription drug. The decreased physical activity indicators included: vigorous exercise on less than 3 days, moderate exercise on less than 5 days, no participation in team sports, not taking P.E. classes at school, and watching television for more than one hour on a school night. Referent values for physical activity were selected based on whether the student met the American College of on recommendations for physical activity (Neiman, 2003). Participation in one or more sports teams was the only significant correlate prescription drug use based on the composite measure, and was limited to lifetime use only.

When categorized by drug class (see Tables 39-41), few significant correlates of prescription drug use surfaced. Participation on one or more sports teams was significantly associated with the use of pain relievers at the $\alpha = 0.05$ level; low levels of vigorous physical activity was associated with both lifetime and past 30 day prescription stimulant use at the $\alpha = 0.01$ level. No indicators of decreased physical activity were associated with prescription depressant use.

Table 38 Indicators of Physical Inactivity Associated with Lifetime and Past 30-Day Non-Medical Use of any Prescription Drug

Indicators of physical inactivity	Lifetime non-medical prescription drug use			Past 30 day non-medical prescription drug use		
	Use %	No use %	Adjusted OR [a,b] (95% CI)	Use %	No Use %	Adjusted OR [a,b] (95% CI)
Exercise						
Vigorous activity on less than 3 days	57.3	51.9	1.3 (0.8, 1.9)	63.3	51.5	1.6 (0.9, 2.8)
Moderate activity on less than 5 days	86.2	81.7	1.4 (0.8, 2.5)	87.0	82.3	1.4 (0.7, 3.1)
No team sports	58.9	46.4	1.6 (1.0, 2.6)*	52.1	49.5	1.1 (0.6, 2.0)
No P.E.	64.4	65.2	0.9 (0.6, 1.5)	58.2	66.3	0.7 (0.4, 1.2)
TV watching						
More than 1 hour per school day	36.2	37.0	0.9 (0.6, 1.5)	33.3	37.4	0.8 (0.5, 1.4)

*P<0.05, **P<0.01, ***P<0.001. [a]The reference group for each logistic regression model was students who did not engage in the health risk behavior at hand. [b]Odds ratios are adjusted for gender and race/ethnicity.

Table 39. Indicators of Physical Inactivity Associated with Lifetime and Past 30-Day Non-Medical Use of Prescription *Pain Relievers*

Indicators of physical inactivity	Lifetime non-medical prescription drug use			Past 30 day non-medical prescription drug use		
	Use %	No use %	Adjusted OR [a,b] (95% CI)	Use %	No Use %	Adjusted OR [a,b] (95% CI)
Exercise						
Vigorous activity on less than 3 days	55.7	52.9	1.2 (0.7, 1.8)	58.9	52.8	1.3 (0.7, 2.3)
Moderate activity on less than 5 days	84.7	82.6	1.2 (0.7, 2.1)	87.5	82.5	1.5 (0.6, 3.4)
No team sports	60.6	46.4	1.8 (1.1, 2.8)*	51.4	49.7	1.0 (0.5, 2.1)
No P.E.	64.4	65.2	0.9 (0.6, 1.5)	60.5	65.7	0.7 (0.4, 1.4)
TV watching						
More than 1 hour per school day	37.9	36.1	1.0 (0.7, 1.6)	35.7	36.6	0.9 (0.5, 1.7)

*P<0.05, **P<0.01, ***P<0.001. [a]The reference group for each logistic regression model was students who did not engage in the health risk behavior at hand. [b]Odds ratios are adjusted for gender and race/ethnicity.

Table 40. Indicators of Physical Inactivity Associated with Lifetime and Past 30-Day Non-Medical Use of Prescription *Depressants*

Indicators of physical inactivity	Lifetime non-medical prescription drug use			Past 30 day non-medical prescription drug use		
	Use %	No use %	Adjusted OR [a,b] (95% CI)	Use %	No Use %	Adjusted OR [a,b] (95% CI)
Exercise						
Vigorous activity on less than 3 days	65.5	52.0	1.7 (1.0, 3.2)	76.7	51.7	2.9 (1.2, 7.0)
Moderate activity on less than 5 days	85.5	82.9	1.2 (0.5, 2.6)	83.3	83.1	1.0 (0.4, 2.6)
No team sports	65.0	48.2	2.0 (1.0, 3.9)	66.7	49.0	2.0 (0.7, 5.6)
No P.E.	75.0	63.7	1.6 (0.8, 3.3)	76.2	64.5	1.4 (0.5, 4.0)
TV watching						
More than 1 hour per school day	29.1	37.7	0.7 (0.4, 1.3)	33.3	36.8	0.9 (0.4, 2.0)

*P<0.05, **P<0.01, ***P<0.001. [a]The reference group for each logistic regression model was students who did not engage in the health risk behavior at hand. [b]Odds ratios are adjusted for gender and race/ethnicity.

Table 41. Indicators of Physical Inactivity Associated with Lifetime and Past 30-Day Non-Medical Use of Prescription *Stimulants*

Indicators of physical inactivity	Lifetime non-medical prescription drug use			Past 30 day non-medical prescription drug use		
	Use %	No use %	Adjusted OR [a,b] (95% CI)	Use %	No Use %	Adjusted OR [a,b] (95% CI)
Exercise						
Vigorous activity on less than 3 days	74.4	51.5	2.9 (1.4, 6.3)**	82.6	51.7	4.6 (1.5, 13.9)**
Moderate activity on less than 5 days	87.2	82.7	1.4 (0.5, 3.8)	78.3	83.3	0.7 (0.3, 2.0)
No team sports	62.1	49.0	1.7 (0.8, 3.6)	61.1	49.4	1.6 (0.6, 4.1)
No P.E.	71.9	64.4	1.4 (0.6, 3.1)	61.1	65.2	0.8 (0.3, 2.1)
TV watching						
More than 1 hour per school day	43.6	36.0	1.4 (0.7, 2.7)	52.2	36.0	1.9 (0.8, 4.5)

*P<0.05, **P<0.01, ***P<0.001. [a]The reference group for each logistic regression model was students who did not engage in the health risk behavior at hand. [b]Odds ratios are adjusted for gender and race/ethnicity.

Research Question Eight

Is there a relationship between the use of problem weight loss strategies and non-medical prescription drug use among a sample of 12th grade students? As indicated by the results of logistic regression analyses in Table 42, the use of problem weight loss tactics was largely associated with both lifetime and past 30 day non-medical use of any prescription drug. Problem weight loss tactics included fasting (the substantially restriction of calories); use of diet pills, powders, or liquids; vomiting or taking laxatives; and taking a prescription drug for weight loss without a doctor's advice. Depending on the weight loss method, students who used these various tactics over the past 30 days were between three and six times more likely to report lifetime non-medical prescription drug use; they were between 3.4 and 9.1 times more likely to report past 30 day prescription use.

Table 42. Problem Weight Loss Strategies Associated with Lifetime and Past 30-Day Non-Medical Use of any Prescription Drug

	Lifetime non-medical prescription drug use			Past 30 day non-medical prescription drug use		
Problem weight loss behaviors	Use %	No use %	Adjusted OR [a,b] (95% CI)	Use %	No Use %	Adjusted OR [a,b] (95% CI)
Past 30 day tactics for weight loss						
Fasted	18.4	6.9	3.0 (1.6, 5.7)***	23.0	8.0	3.4 (1.7, 7.0)***
Use of diet pills, powders or liquids	15.2	3.8	4.9 (2.2, 10.9)***	16.1	5.4	3.5 (1.5, 8.0)**
Vomited or took laxatives	11.1	2.1	5.7 (2.1, 15.8)***	12.9	3.2	4.4 (1.7, 11.5)**
Took Rx drugs without a doctor's advice	5.7	1.4	4.1 (1.2, 14.4)*	10.0	1.2	9.1 (2.5, 33.4)***

*P<0.05, **P<0.01, ***P<0.001. [a]The reference group for each logistic regression model was students who did not engage in the health risk behavior at hand. [b]Odds ratios are adjusted for gender and race/ethnicity.

Tables 43-45 illustrate the results of analyses performed on the specific drug classes as opposed to a composite measure of any non-medical prescription drug use. Use of each of weight loss methods was significantly associated with non-medical use of prescription stimulants at either the $\alpha = 0.001$ or 0.01 levels. Associations for these behaviors ranged from 3.7 times greater odds of lifetime stimulant use when fasting was present in the past 30 days, to a 22.4 greater odds of past 30 day stimulant use when the student took prescription drugs without a doctor's advice.

Associations between problem weight loss tactic and non-medical prescription pain reliever or depressant use were generally not as strong as those for stimulants. In addition, no relationship existed between vomiting or taking laxatives and depressant use or pain reliever use in the past 30 days. Likewise, no association between taking prescription drugs without a doctor's advice and lifetime pain reliever use was found.

Table 43. Problem Weight Loss Strategies Associated with Lifetime and Past 30-Day Non-Medical Use of Prescription *Pain Relievers*

	Lifetime non-medical prescription drug use			Past 30 day non-medical prescription drug use		
Problem weight loss behaviors	Use %	No use %	Adjusted OR [a,b] (95% CI)	Use %	No Use %	Adjusted OR [a,b] (95% CI)
Past 30 day tactics for weight loss						
Fasted	17.9	7.6	2.6 (1.3, 5.0)**	20.0	8.9	2.5 (1.2, 5.6)*
Use of diet pills, powders or liquids	16.2	3.4	5.1 (2.3, 11.2)***	18.0	5.6	3.8 (1.6, 9.1)*
Vomited or took laxatives	10.6	2.7	4.3 (1.7, 10.8)**	9.8	3.9	2.6 (0.9, 1.6)
Took Rx drugs without a doctor's advice	5.5	1.7	3.3 (1.0, 11.0)	10.2	1.4	7.7 (2.1, 27.6)**

*P<0.05, **P<0.01, ***P<0.001. [a]The reference group for each logistic regression model was students who did not engage in the health risk behavior at hand. [b]Odds ratios are adjusted for gender and race/ethnicity.

Table 44. Problem Weight Loss Strategies Associated with Lifetime and Past 30-Day Non-Medical Use of Prescription *Depressants*

Problem weight loss behaviors	Lifetime non-medical prescription drug use			Past 30 day non-medical prescription drug use		
	Use %	No use %	Adjusted OR [a,b] (95% CI)	Use %	No Use %	Adjusted OR [a,b] (95% CI)
Past 30 day tactics for weight loss						
Fasted	22.5	8.8	3.0 (1.4, 6.4)**	28.0	9.0	4.0 (1.5, 10.3)**
Use of diet pills, powders or liquids	16.3	6.1	3.0 (1.3, 7.3)*	20.0	6.2	3.7 (1.2, 10.7)*
Vomited or took laxatives	10.0	4.1	2.5 (0.9, 7.1)	12.0	4.2	3.0 (0.8, 11.1)
Took Rx drugs without a doctor's advice	10.4	1.7	6.7 (2.0, 23.0)**	13.0	1.8	8.3 (1.9, 36.1)**

*P<0.05, **P<0.01, ***P<0.001. [a]The reference group for each logistic regression model was students who did not engage in the health risk behavior at hand. [b]Odds ratios are adjusted for gender and race/ethnicity.

Table 45. Problem Weight Loss Strategies Associated with Lifetime and Past 30-Day Non-Medical Use of Prescription *Stimulants*

Problem weight loss behaviors	Lifetime non-medical prescription drug use			Past 30 day non-medical prescription drug use		
	Use %	No use %	Adjusted OR [a,b] (95% CI)	Use %	No Use %	Adjusted OR [a,b] (95% CI)
Past 30 day tactics for weight loss						
Fasted	26.5	9.0	3.7 (1.6, 8.7)**	36.8	9.1	5.7 (2.1, 15.5)***
Use of diet pills, powders or liquids	20.0	6.1	3.9 (1.5, 10.1)**	25.0	6.4	4.9 (1.6, 14.7)**
Vomited or took laxatives	17.1	3.7	5.2 (1.9, 14.7)**	23.8	3.8	7.6 (2.5, 23.6)***
Took Rx drugs without a doctor's advice	12.1	1.9	7.1 (1.9, 25.6)**	26.3	1.5	22.4 (6.1, 82.5)***

*P<0.05, **P<0.01, ***P<0.001. [a]The reference group for each logistic regression model was students who did not engage in the health risk behavior at hand. [b]Odds ratios are adjusted for gender and race/ethnicity.

Summary

This chapter reports the results associated with the eight research questions. First, an overview of participant demographics and profile of non-medical prescription drug use behaviors were presented. Table 3 provides a breakdown of the demographic characteristics of the student participants. Tables 5-8, provide a summary of self-reported behaviors related to non-medical prescription drug use.

Second, analyses determining the relationship between two demographic characteristics, gender and race/ethnicity, and prescription drug use were reported in Tables 9-12. The purpose of these chi-square and preliminary logistic regression analyses was to determine if the demographic characteristics needed to be controlled for. Although no significant relationship existed between the demographic variables and non-medical prescription drug use, it was decided that they should still be incorporated into

the logistic regression models in case they demonstrated a significant relationship with one more or the other independent variables.

The remaining tables (13-45) illustrate the results of multiple logistic regression analyses conducted to assess the relationship among non-medical prescription drug use and multiple adolescent risk behaviors. Behaviors pertaining to illicit substance use, tobacco use, alcohol use, sexual risk, violence, depression and suicide ideation, decreased physical activity, and use of problem weight loss tactics were built into research questions one through eight. A significant relationship exists between nearly all of the specific behaviors related illicit drug, tobacco, and alcohol use and lifetime and past 30 day non-medical use of prescription drugs. Although to a lesser extent than substance use behaviors, behaviors related sexual risk, violence, depression and suicide ideation, and problem weight loss practices were also associated with both lifetime and past 30 day non-medical use of prescription drugs. Overall, behaviors related to decreased physical activity were not associated with non-medical prescription drug use.

Chapter 5 presents a summary of the purposes, methodologies and results; discussion; implications for future research and practice; and conclusions.

CHAPTER 5
SUMMARY, DISCUSSION, IMPLICATIONS, AND CONCLUSION

Summary

In this chapter, a summary of the purposes, methodologies, results; discussion; implications; and conclusions are presented. The implications include recommendations for future research, practice, and strengthened surveillance regarding non-medical prescription drug use.

This investigation examined the scope of non-medical prescription drug use among a population of high school seniors using a modified version of the YRBS, the Santa Rosa County Health Behavior Survey (SRCHBS). The main purposes of the study were to design reliable and valid prescription drug items for the YRBS, and to identify correlates non-medical prescription drug use and other adolescent risk behaviors. The investigation was also conducted with future expectations of improving monitoring and tracking systems; raising awareness among public health professionals about risks of non-medical prescription drug use among adolescents; informing policy, prevention, and treatment measures related to non-medical prescription drug use and abuse; and encouraging inclusion of prescription drug items on surveys that monitor drug use and youth risk behaviors.

For this study, data were collected using a cross-sectional census survey research design. The study took place in three stages: the design and expert panel review of items addressing non-medical prescription drug use; pilot testing of these new items within the

context of the SRCHBS; and administration of the revised instrument to a group of 12th graders during the spring of 2006.

Upon the development of items based on a review of the literature, I enlisted a panel of experts who used guidelines to establish content validity, and appropriateness of the survey items for the target population. The "experts" chosen to conduct the review included professionals with expertise in the area of study, measurement specialists, and researchers familiar with the target audience. Based upon the experts' comments, items were modified and prepared for the pilot study.

The pilot study served two functions: to test the procedures used for administration of SRCHBS; and to assess test-retest reliability of the newly constructed items. The survey, which included a total of 102 items, was administered to a convenient sample of 175 9th through 12th grade students from a Northwest Florida public high school on two occasions— approximately two weeks apart. Teachers serving as proctors received a brief instructional session describing the study and the protocol designed for collecting data. Upon completion of the pilot study, reliability of the new items was evaluated by kappa coefficient determination. Most items were assessed as having either "good" or "excellent" reliability.

For the main study, the survey was administered to the 12th grade student body of two Northwest Florida public high-schools (different from the pilot) in a format similar to that for the pilot study. Unlike in the pilot study however, survey administration for the main study was conducted in a group setting due to logistical constraints imposed by the high school principals. Data collection took place on May 1, 2006 during two student assemblies. Nonetheless, considerable attention was placed on ensuring anonymity,

privacy, and confidentiality among all student respondents. A total of 485 questionnaires were collected from the student population of the two schools enlisted for the study. Of those collected questionnaires, 50 were disregarded upon sight editing yielding 435 usable questionnaires for a 59.8% response rate.

A profile of non-medical prescription drug use behaviors illustrated that 31.9% of respondents used a prescription drug non-medically during their lifetime on one or more occasion. In reference to specific drug classes, 28.6% of the students reported lifetime non-medical use of prescription pain relievers; 12.7% reported non-medical use of prescription depressants, and 9% indicated non-medical use of prescription stimulants during their lifetime. Far fewer students reported past 30 day use of prescription drugs. Most students who reported non-medical prescription drug use initiation at age 15 or older. Most students who use prescription drugs reported they obtain the drugs for non-medical use from a friend and used the drug to get "buzzed, high, or stoned."

In addition to providing measures of prevalence of non-medical prescription drug use, the study was designed to answer eight research questions:

1. Is there a relationship between illicit drug use (i.e., marijuana, cocaine, inhalants, heroin, methamphetamine, ecstasy, and steroids) and non-medical prescription drug use?

2. Is there a relationship between tobacco use and non-medical prescription drug use?

3. Is there a relationship between alcohol use and non-medical prescription drug use?

4. Is there a relationship between sexual risk behaviors and non-medical prescription drug use?

5. Is there a relationship between violence-related behaviors and non-medical prescription drug use?

6. Is there a relationship between depression and suicide ideation and non-medical prescription drug use?

7. Is there a relationship between decreased physical activity and non-medical prescription drug use?

8. Is there a relationship between the use of problem weight loss tactics and non-medical prescription drug use?

To address the research questions, inferential statistics were used to examine the relationship among non-medical prescription drug use and other adolescent health risk behaviors of interest. The dependent variable, non-medical prescription drug use, was reported two ways: using dichotomized (yes/no) measures of prevalence items corresponding to the three major classes of abusable prescription drugs— pain relievers, depressants, and stimulants; and using a dichotomized (yes/no) composite score of those prevalence items to denote *any* non-medical prescription drug use. The independent variables included the use of illicit drugs, tobacco, and alcohol; sexual risk behaviors; violence-related behaviors; depression, suicide ideation, and suicide attempts; decreased physical activity; and the use of problem weight tactics. Multiple logistic regression analyses were used to investigate whether significant relationships exist between the independent and dependent variables among the study participants.

According to the multiple logistic regression analyses, non-medical use of prescription drugs was significantly related to almost all health risk behaviors accounted for by this study when adjusting for race and gender. This included risk behaviors related to illicit drug, tobacco, and alcohol use; sex; violence; depression and suicide; and problem weight loss. Most of the risk behaviors pertaining to decreased physical activity however, were not significantly associated with non-medical prescription drug use.

Discussion

Based on the findings from the pilot study, the SRCHBS seems to be a valid and reliable instrument. The YRBS, the survey upon which the SRCHBS was based, had already been deemed a valid and reliable instrument (Brener et. al, 2003, 1995). By first basing my newly designed items on questions found in valid nationally administered surveys, and second, addressing the revisions provided by the expert review panel, I was able to have a reasonable amount of confidence that items were representative of the concepts they were intended to reflect. In addition to those measures, I also built a comment box into the pilot-tested survey to assess whether or not students had any confusion pertaining to the questionnaire items.

By computing simple and weighted Kappa coefficients for the items of interest, I was able to estimate that approximately two-thirds of my items fell within the range of "good" or "excellent" reliability. Two items fell within the range of "moderate" and one item fell within the "poor" range. It is important to note that the items which demonstrated lower levels of reliability dealt with past 30 day measures. Because the methods called for a test and re-test that were two weeks apart, it is wholly possible that students were accurately reporting behaviors on the two occasions. However, their 30-day window of drug use behaviors was shifted two weeks forward on the second occasion. This would perhaps cause them to report different levels of use on the two occasions.

Because most of the items fell within the moderate, good, or excellent ranges, I was able to conclude the items were reliable and appropriate for the main study. Moreover, as a result the feedback received during the expert panel review and the reliability coefficents obtained during the pilot study, I was confident that adding the

prescription drug use items would not threaten the integrity (i.e., the validity and reliability) of the YRBS.

In interpreting the results of the larger study, it is important to recognize that as the data were cross sectional, inferences about causality are limited. Therefore, it is not possible to assess whether the non-medical use of prescription drugs was preceded by the risk behavior correlates or vice-versa. Longitudinal data would be necessary to examine the directionality of these associations. Nonetheless, the present study does contribute to the understanding of the scope of non-medical prescription drug use among a selected group of adolescents.

Furthermore, the study is subject to the limitations of the self-report methods used. Health risk behavior survey research has been widely accepted as a valid method for obtaining such information especially when measures are taken to maintain confidentiality (Brener et al., 2003). However, some students may be inclined to over-or under-report behaviors, especially when sensitive items are presented.

In addition, non-response may have introduced potential bias into the study. As reported earlier, 40.2% of the eligible study population did not participate. The two student assemblies used to collect data were conducted on May 1, three weeks before the end of the school year. Although I was ensured that the assemblies would be mandatory for all seniors, it was apparent that many did not attend, likely due to proximity to the end of the school year. Furthermore, advanced placement (AP) testing was being conducted on the day of survey administration in both schools. It is not possible however, to estimate the influence these non-participators may have on the final study results.

Descriptive statistics generated for the main study found a relatively equal distribution of male (48.2%) and female (51.8%) participants who were mostly White (78.6%). Hispanics, Blacks, and other ethnic groups comprised 5.4%, 4.4%, and 11.6% of the study's population, respectively. Racial/ethnic distribution for the present study differed slightly from the distribution among high school student in the greater Santa Rosa County school district. Whites, Hispanics, Blacks, and other racial ethnic groups comprised 89.4%, 2.0%, 4.8%, and 3.8% respectively, of the school district in 2004 (Florida Department of Education, 2005).

Descriptive analyses also provided a profile of non-medical prescription drug use prevalence and associated responses among the survey respondents. Close to one-third (31.9%) of participants reported lifetime use of a prescription drug for non-medical reasons; 16% of the study subjects reported past 30 day non-medical use and 8.8% reported past 30 day non-medical use on school property. According to national prevalence estimates, 13.7% of U.S. youth ages 12-17 have used prescription drugs non-medically in their lifetime; and 4.0% are current users (SAMHSA 2004a). These figures may not be directly comparable due to the fact that NSDUH measures include 12-17 year olds and the present study only includes high school seniors, a subset of the youth segment. As a simple function of age, high school seniors are likely to have higher rates of drug use as compared to the general youth population.

When classified by specific drug class, descriptive analyses revealed approximately 30% of the survey respondents reported lifetime non-medical use of pain relievers, whereas approximately 13% and 9% of students reported lifetime depressant

and stimulant use, respectively. Estimates of past 30-day prevalence were 12.9%, 6.9%, and 5.3%, for pain relievers, depressants, and stimulants, respectively.

In the scheme of illicit drug use in the U.S., national estimates rank non-medical prescription drugs second only to marijuana as the drugs of choice among American Youth (Johnston et al., 2005b). Data from the present study confirm this assertion. As seen in Table 7, the use of pain relievers and depressants follow marijuana in both lifetime and past 30-day prevalence estimates; stimulants trail behind cocaine. Curiously, when placed into the context of use on school property, prescription pain relievers are used more readily than marijuana. One explanation for this might be the ease of concealment of pain relievers which often come in tablet form and that can be easily ingested as opposed to marijuana which is most often smoked and emits a characteristic, conspicuous odor.

Most study participants who had used prescription drugs non-medically indicated they first used the drugs at the age of 15 years or older. Specifically, students using pain relievers or stimulants reported initiation at age 15 or 16 most often. However, a large proportion of pain reliever (36.9%) and stimulant users (48.6%) also reported initiation at age 14 or younger. Of the students who reported the use of depressants, most initiated use at age 17 or older. Slightly fewer users of depressants (34.4%) initiated use at age 14 or younger. These results suggest that some students may begin their experimentation with prescription pain relievers or stimulants before moving on to depressants. These data pertaining to age of first use give cause for concern because they suggest that over one-third of all initiation takes place during the middle school years or younger.

When asked where they obtain the prescription drugs they were using non-medically, the most common response was from "a friend," although respondents also cited their parents (both with and without permission), and their personal supply as sources. These findings are consistent with studies assessing social (i.e., friends, family members) versus commercial (i.e., bought or stolen from stores, Internet, dealers) sources of drugs (Harrison, Fulkerson, & Park, 2000). In prior research, friends have been established as the most common source for any substance, including tobacco, alcohol, illicit drugs, and prescription drugs for illicit use (Harrison, Fulkerson, & Park, 2000; McCabe & Boyd, 2005). Second to friends, family members (with out without their consent) are also an important source of drugs (McCabe & Boyd, 2005). Reliance on friends and family is especially strong when drug use is infrequent (Harrison, Fulkerson, & Park, 2000).

The most striking about these data is the relative rarity for which participants cited the Internet or stealing from a pharmacy/doctor's office as a source of the drugs. The Internet has been highlighted as an emerging source of prescription drug diversion (NCASA 2006, 2005). Many Web sites, though violating federal law, sell controlled prescription drugs without a prescription. Estimates of the number of Internet pharmacies dispensing prescription drugs are as high as 1,400 (NCASA, 2006). Though little or no data is available on the percentage of prescription drug abusers who get their drugs online, the Internet serves as an obvious source by which technologically savvy youth might be able to obtain the drugs.

Theft from retailers or medical providers has likewise been cited as an important source of prescription drug diversion (NCASA, 2005). In the case of the present study,

however, they did not play a significant role as sources of the drugs for the students. Based on the results, the importance of social networks as sources of the drugs is dramatically clear. Although policy control and curbing teen access to controlled substances is important, the findings suggest that the widespread accessibility from friends and family merits further discussion.

With the exception of prescription stimulants, research on motives for non-medial use of controlled prescription drugs has been relatively sparse (Teter, McCabe, Cranford, Boyd, & Guthrie, 2005). The present study strongly suggests that across all three drug classes, students who use the drugs, primarily do so "to get buzzed, high, or stoned" or in other words, for the euphoric effects of the drugs. Respondents also readily cited "experimentation" as a primary motive across all three drug classes. Some students also claimed to use the drugs to "alter the affects of other drugs" or "get away from problems". These results further confirm the validity of the items in that they assess non-medical drug use— that is, using a drug was *not prescribed* for the respondent and was carried out *only for the feeling* it caused.

Other prevailing responses suggest that students not only used the drugs for general euphoric effects but also took them to self-medicate. For example, a large portion of respondents indicated they took a pain reliever to relieve physical pain, a valid use for the medications but nonetheless considered non-medical use if taken without a doctor's prescription. A moderate percentage of respondents reported prescription pain reliever and depressant use to "relax or relieve stress," also a valid use for the medications which serve as central nervous system depressants. Stimulants were also cited as being used for medically accepted purposes: "to concentrate or study," "to get

more energy or stay awake," and "to lose weight." Despite these known valid uses for the drugs, the use of any controlled drug can be dangerous without the permission and supervision of a medical professional.

For the current study, chi-square analysis found no gender or race/ethnicity differences for non-medical prescription drug use. This contradicts pervious findings from national data sets or similar studies conducted at state levels which have found significant differences in use patterns among the genders and races. Previous studies have in fact reported a number of conflicting results including adolescents females' greater propensity for opioid pain reliever use (Boyd et al., 2006; Sung et al., 2005); although others studies have reported males as being significantly more likely to use opioid pain medications such Vicodin and OxyContin non-medically (McCabe & Boyd et al., 2005). Some studies indicate that males report higher stimulant use (McCabe, Teter, & Boyd, 2004) while others report no gender differences for the non-medical use of stimulants such as Ritalin (McCabe, Teter, Boyd, & Guthrie, 2004). Although no studies have reported on the use of depressants in high school students, college males more likely to use benzodiazepines (depressants) than females (McCabe, 2005).

On the other hand, previous studies have expressed a consistently stable relationship between race/ethnicity and non-medical prescription drug use. With the exception of one small-scale study (Boyd et al, 2006) White adolescents report significantly higher prevalence for non-medial prescription drug use across all three drug classes including opioids pain relievers (McCabe & Boyd et al. 2005; Sung, 2005), benzodiazepine depressants (McCabe, 2005), and stimulants (McCabe, Teter, & Boyd, 2004; McCabe & Knight, et al., 2005; McCabe, Teter, Boyd, & Guthrie, 2004).

In the present study, an absence of an effect due to gender or race/ethnicity may have been due in part to low sample size and/or having conducted the study among a relatively homogeneous group in relation to race. In addition, because there were so few ethnic minority students among the participants, it was necessary to combine the race/ethnicity levels to form simply two levels— White and non-White. Although this gave me the ability to conduct the chi-square analysis, it also lowered specificity of the analyses when it came to race. Due to these circumstances, I decided it would be sensible to control for gender and race/ethnicity when addressing the research questions.

Of the risk behaviors examined using inferential statistics, non-medical prescription drug use was most significantly related to the use of various illicit substances. Those students who reported the non-medical use of any prescription drug in their lifetime were 20 times more likely to use highly controlled drugs such as methamphetamine and ecstasy, both classified as schedule I drug based on their high tendency for abuse and lack of accepted medical use (U.S. DEA, n.d.). Use of marijuana, cocaine, inhalants, and heroin were also high (around 6 to 8 times as high), among students who used prescription drugs non-medically in their lifetime. Students reporting past 30-day non-medical prescription drug use (a proxy for current use), currently used illicit drugs at a rate higher than students who had simply used prescription drug non-medically sometime during their life. This was true for both marijuana and cocaine for which past 30-day measures were present. Furthermore, past 30 day non-medical use of prescription drugs, exacerbated the odds that a student used marijuana on school property. These students were 20 times more likely to smoke marijuana at school than their counterparts who had not used prescription drugs non-medically in the past month.

When the inferential results pertaining to illicit drug use were presented by specific prescription drug class, they painted an interesting picture of the scope of prescription drug use in relation to illicit drug use. Prevalence rates for lifetime and past 30-day non-medical prescription pain reliever use (28.6% and 12.9%) were far greater than those for depressants (12.7% and 6.9%) or stimulants (9.0% and 5.3%). This would denote that the non-medical use of prescription pain relievers is a more commonplace occurrence among adolescents. With the exception of steroids, odds of co-occurrence of non-medical use of pain relievers and all other classes of drugs was high. However, the odds of prescription and illicit drug use co-occurrence appeared to be higher when the prescription drug was a stimulant and substantially higher when the drug was a depressant. Furthermore, the use of depressants highly exacerbates the odds of using drugs that are generally viewed as "harder" or have more abuse and harm potential, including heroin, cocaine, heroin, and methamphetamine. These findings may suggest that not only is the non-medical use of pain relievers more common than depressant or stimulant use, but it is associated to a lesser extent with deviant or problem behavior. Although not directly comparable, these results appear to be consistent with previous findings which suggest the non-medical use and abuse of prescription drugs increases an adolescent's odds for a host of other drug use behaviors (McCabe, 2005; McCabe, Boyd, & Teter, 2005; McCabe, Teter, Boyd, & Guthrie, 2004).

Though to a lesser degree than illicit drug use, tobacco and alcohol use behaviors were also associated with non-medical prescription drug use. Participants who had ever smoked a full cigarette were about six times more likely than their non-smoking peers to have engaged in lifetime non-medical use of any prescription drug. Students who

smoked cigarettes, cigars, cigarillos; or chewed tobacco in the past 30 days were four to five times more likely to use prescription drugs non-medically. These data are fairly consistent with those from previous studies which demonstrate the four- to seven-fold increase in odds of prescription drug use when students report past month cigarette smoking (Boyd, McCabe, & Teter, 2006; McCabe, 2005; McCabe, Boyd, & Teter, 2005; McCabe, Teter, Boyd, & Guthrie, 2004). The odds of any non-medical prescription drug use were greatly inflated if the student smoked cigarettes on school property. Smoking on school property, perhaps, exacerbates odds of non-medical prescription drug use because it is viewed as a particularly devious behavior. This is likely due to the fact that Florida schools are *smoke-free facilities* and state laws strictly prohibits smoking among minors within 1,000 square feet of a public or private elementary, middle, or high school (Florida Legislature, 2006). Particular attention should be paid to the large covariance of lifetime cigarette and lifetime depressant use (OR=61.5). As with the strong relationship to illicit drugs, the use of depressants seems to represent slightly riskier behavior than pain relievers or stimulants.

Engaging in alcohol-drinking behaviors including lifetime use; past 30-day use, past 30-day binge, and past 30-day use on school property all significantly increase the odds of non-medical use of any prescription drug. Additional alcohol-related behaviors including driving a car after alcohol use and riding in a car with a driver that has been drinking also significantly increase a student's odds of non-medical prescription drug use. Consistent with the extant literature, odds of prescription drug use are increased from four- to seven-fold when a student reports alcohol use and related behaviors, depending on the drug class analyzed (Boyd, McCabe, & Teter, 2006; McCabe, 2005; McCabe,

Boyd, & Teter, 2005; McCabe, Teter, Boyd, & Guthrie, 2004). As with tobacco use on school property, alcohol use on school property, representing a particularly deviant behavior, generally exacerbates the odds of lifetime and past 30 day use of prescription drugs (including on school property) from all three drug classes.

Selected behaviors suggestive of sexual risk taking were associated with non-medical prescription drug use. These included ever having sexual intercourse, having more than three lifetime or past month partners, and having used alcohol or drugs before last sexual encounter. No relationship was found between contraceptive use (specifically condom use) and prescription drug use among any of the drug classes. When classified by drug class however, prescription depressants demonstrated the strongest relationships with the sexual risk taking behaviors, again suggesting that this type of drug use is slightly more deviant than prescription pain reliever or stimulant use.

Although relationships between sexual risk taking and non-medical prescription drug use have never been reported in the literature, numerous studies have demonstrated a relationship between sexual risk behaviors and problem drug use using a version of the YRBS (Lowry et al., 1994; Shrier et al., 1996; Shrier & Crosby, 2003; Valois et al., 1999). Some of the strongest correlates of behaviors that put adolescents at risk for HIV and other sexually transmitted infections have been alcohol, tobacco, marijuana, and cocaine use (Lowry et al., 1994; Shrier et al., 1996; Shrier & Crosby, 2003; Valois et al., 1999). Considering that non-medical prescription drug use was to a large extent significantly related to alcohol, tobacco, and other drug use in this study, it is no surprise that it is likewise related to sexually risky behaviors. These findings suggest that programs designed to prevent sexually transmitted diseases would benefit students by

addressing prescription drug use and abuse (as well as other drug use) in addition to sexual behavior.

Youth violence has been the focus of significant attention in recent years due to violent acts such as school shootings and high rates of crimes involving violence and theft among American adolescents (Valois, MacDonald, Bretous, Fisher, & Drane, 2002; Valois et al., 1995). Numerous indicators of violence— with the respondent either being the perpetrator or victim— were significantly correlated with non-medical use of prescription drugs. These included carrying any weapon including a gun; feeling so unsafe they missed school; being threatened or injured with a weapon; having property stolen or damaged; physical fighting and fighting-related injuries; being hurt by a romantic partner; or ever being forced to have sexual intercourse. These behaviors tended to most related to non-medical prescription drug use when depressant or stimulant drugs were involved.

Previous studies have confirmed the relationship between adolescent violence and aggression and substance use behaviors. Substance use such as any alcohol use, binge drinking, and illegal drug use (i.e., marijuana, cocaine, and intravenous drug use) have been strong predictors of fighting, weapon carrying (Valois & McKeown, 1998; Valois, et al., 1995). Overall, these comparisons suggest that the relationships between non-medical prescription drug use and violence perpetration are not unlike those of alcohol or illicit drug use and violence perpetration.

Interestingly, violence victimization has not been addressed a great deal in the extant literature. However, when it was addressed, it was only slightly (not significantly) inversely associated with adolescent drug use (Albus et al., 2004). That is, victims of

violence were generally less likely to use drugs. In the present study, opposite effects were found in which students who felt unsafe at school, were threatened , or had property stolen/damaged were more likely to use prescription drugs non-medically. This inconsistency suggests that more research should perhaps, be conducted on this area of study.

Specifically among females, forced sexual intercourse has been associated with heavy smoking, alcohol and/or drug use before sex, and the use of "hard" drugs such as cocaine (Howard & Wang, 2005; Silverman et al., 2001). Although the current study does not account for prescription drug use before sex or the recency of the forced sex experience, it is possible that these young women (and their partners) are in fact using the prescription drugs before sex which may impair their own abilities or alter their partners' personalities so they become more aggressive. These results suggest that clinicians who treat adolescent sexual assault victims should provide referrals for support services that address substance use and abuse, including that of prescription drugs.

Ideations and behaviors related to depression and suicide were to some extent related to non-medical use of any prescription drug. Students who used prescription drug in the past 30 days were close to three times more likely to report feelings of depression in the past year than students who did not use the drugs. Students who used any prescription drug in the past 30 days were also significantly more likely to consider, plan, and attempt suicide. As with most of the other health risk behaviors, the indicators related to depression and suicide had strongest correlations with prescription depressants and stimulants.

Suicide, a leading cause of death for youth aged 12 to 19 is often conceptualized as the endpoint of a continuum that begins with suicide ideation, followed by planning, attempting, and completing suicide (Barrios et al., 2000). Depression—the persistence of a sad, anxious, or "empty" mood— is widely recognized as a risk factor for suicide and is thus, strongly linked the outcomes of planning or effecting a suicide attempt (National Institute of Mental Health [NIMH], 2003). The use of both "gateway" (including cigarettes, alcohol and marijuana) and "hard" (including cocaine, other illicit stimulants, and inhalants) substances have been linked to depression and suicide ideation in past studies (Galaif, Chou, Sussman, & Dent, 1998)

There are two main hypotheses regarding the relationship between adolescent depression and substance use. The first is that substance use has a negative impact on adolescent mental health. Research indicates for example, that alterations in key brain neurotransmitters such as serotonin, dopamine, norepinephrine, and acetylcholine (affected by various prescription drugs) have all been associated with an increased risk of suicide (NIMH, 2003; Brown & Gershon, 1993). The second, or the "self-medication" hypothesis, purports that harmful substance use behaviors develop and persist as an attempt to cope with feelings of depression and suicide ideation (Galaif et al., 1998). Ninety percent of people who succeed at suicide have depression or another diagnosable mental or substance abuse disorder (NIMH, 2003). Although directionality of the relationship between non-medical prescription drug use, depression, and thoughts or attempts of suicide cannot be established in this study, the findings imply that there is indeed a relationship between these variables.

Recently, dissatisfaction with weight and body size have been increasing among both female and male adolescents (Berg, 2001). During the same time, the American population has become increasingly overweight and obese (CDC, 2006). In 2002 for example, there were more than three times as many overweight adolescents as there were in 1980 (Hedley, Ogden, Johnson, Carroll, Curtin, & Flegal, 2004). Studies have shown that adolescents with body dissatisfaction— even those within healthy body weight ranges—often engage in unhealthy weight control behaviors, such as fasting and self-induced vomiting which can lead to abnormal physical and psychological development (Neumark-Sztainer et al., 2002; Neumark-Sztainer & Hannan, 2000).

Adolescents with body dissatisfaction issues are not only susceptible to unhealthy weight control behaviors, but they may also be at heightened risk for substance use (Garry, Morrissey, & Whetstone, 2002; Rafiroiu et al., 2003). Extreme adolescent dieters (who fast, use diet pills, or use self-induced vomiting for weight control) are more likely to use alcohol, cigarettes, and marijuana than moderate adolescent dieters (who use exercise or eating fewer calories to control their weight) or adolescents who do not diet at all (Rafiroiu et al., 2003). Although these unhealthy weight control behaviors assessed through the use of the YRBS cannot be characterized as eating disorders, the extant literature is also beset with evidence on the co-occurrence of substance abuse (including both licit and illicit substances) and eating disorders, especially bulimia nervosa (Lock, Reisel, & Steiner, 2001; Neumark-Sztainer et al., 1998; Ross & Ivis, 1999; Von Ranson, Iacono, & McGue, 2002). Particularly relevant to the present investigation, recent studies have found relationships between binge-and-purge eating and many types of prescription drug including stimulants, barbiturates, and tranquilizers among both males and females.

After alcohol, tobacco, and marijuana, barbiturates (prescription depressant drugs) were the most favored drugs by adolescent male bingers while stimulants were the most favored drugs by female bingers (Ross & Ivis, 1999).

The present study supports existing literature in that the non-medical use of any prescription drug was significantly associated with all of the four unhealthy weight control behaviors included in the study: fasting; use of diet pills, powders or liquids; vomiting or taking laxatives; or taking a prescription drug without a doctor's advice. The non-medical use of prescription stimulant drugs was most highly associated with the use of weight loss tactics. This phenomenon is not surprising considering a medical indication for some stimulant drugs is weight loss. Perhaps, these students were self-prescribing drugs they knew could potentially enhance the effects of their weight loss attempts. In addition, these students—who were likely dealing with issues associated with body image—may have been self-medicating for some of the same reasons depressed students self medicated using prescription drugs.

Surprising results involved the relative lack of association between non-medical prescription drug use and lack of exercise. Previous research found inverse relationships between physical activity level and level of cigarette, smokeless tobacco, or marijuana use (Pate et al., 1996; Winnail et al., 1995). These findings imply that low levels of physical activity may be associated with multiple substance use behaviors. However, the relationship between physical inactivity and substance use did not extend to prescription drugs in the present study. The only activity-related behavior associated with any type of prescription drug use was non-participation in team sports. When reported by drug class, use of pain relievers was only associated with non-participation in team sports; stimulant

use was only associated with vigorous activity on less than 3 days of the week; and depressant drugs were not associated with any exercise-related behaviors.

Implications

The present study provides important implications regarding the scope of non-medical prescription drug use among a specific group of 12th grade students. The non-medical prescription drug use behaviors examined in the present study correlate with other health risk behaviors (substance use, violence, sexual activity, etc.) fitting to some degree with the Jessor's model of problem behavior (Jessor & Donovan et al., 1991). The results suggest that non-medical prescription drug use (which may lead to abuse) is indeed related to a "syndrome," an organized constellation of risk taking or problem behaviors among adolescents. This suggests that institutional efforts aimed at the prevention of non-medical prescription drug use should not focus on prescription drug alone. Rather, efforts aimed at prevention and/or treatment of non-medical prescription drug use and abuse should focus on multiple risk behaviors and co-occurring disorders.

Furthermore, the results have implications not only for the content of programs/interventions aimed at preventing and managing the non-medical use of prescription drugs but also provide insight for the channels through which these prevention messages and strategies should be disseminated. The two leading sources of prescription drugs (and likely information about those drugs) were friends and family. As part of prevention efforts, students and family members need to understand the potential dangers with providing abusable prescription drugs to their peers and relatives.

According to this study, prevalence of non-medical prescription drug use was high among adolescents and is inextricably linked to most other youth risk behaviors including tobacco, alcohol, and illicit drug use; violence; sexual experience; depression

suicide ideation; and problem weight loss strategies. Surveillance systems that monitor youth risk behaviors, namely the CDC's Youth Risk Behavior Survey, would therefore benefit by including items that assess non-medical prescription drug use and abuse.

Based upon the findings from the present study, I propose the following recommendations for future research and practice.

Recommendations for Research

1. Replicate the study among a larger, more geographically and racially diverse population. This study was conducted among students in two of six schools in a mid-sized Northwest Florida county. These schools had a relatively small proportion of minority students and were somewhat more affluent than schools in the larger Northwest Florida region. Broader-based replication studies would increase generalizability of the study to other populations.
2. Replicate the study among 9th-12th graders. The original research design included surveying a convenient population of students in grades 9 through 12. However, logistical constraints placed upon the researcher by the school district restricted the study to 12th graders. Replication studies involving multiple grade levels would allow for the monitoring of trends in non-medical prescription drug use across multiple age groups.
3. Conduct replication studies earlier in the school year when students are not preoccupied with advanced placement testing, final examinations, or the end of the school year. This would likely reduce the non-response rate because both students and teachers would be more focused on the task of completing the survey.

4. Replicate the study, as originally proposed, in the individual classroom setting rather than the large group setting of the school cafeteria to enhance validity. The YRBS was initially designed to be administered by teachers in the classroom, where students are instructed to spread out so they can not see each others' responses. CDC methodology also encourages students to cover their responses as they complete the questionnaire and includes provisions for students to seal completed answer booklets before turning them in (Brener et al., 2004). In the present study, seating in the cafeteria was close and may not have provided adequate opportunity for students to spread out and cover their answers so they could respond in an honest manner without being influenced by their peers.
5. Conduct qualitative research to refine the definition of non-medical prescription drug use among adolescents. Focus group and one-on-one research methods have been used to enhance content validity through consultation with members of the target population (Vogt, King, & King, 2004). The definition used in the current study may have captured students who used the drugs for therapeutic reasons although without a physician's prescription. Although this is considered *non-medical use* by many sources, it is considered *misuse* by others. Consultation with the target population regarding their understanding of the definition used may serve to enhance validity of the items.
6. Conduct further research to gain insight into not only the risk but also protective factors associated with nonmedical prescription drug use and abuse. Behavioral researchers have recently begun to focus greater attention upon the assessment and promotion of youth developmental assets in the prevention of health risk-

taking (Zweig, Phillips, & Lindberg, 2002; Hawkins, Catalano, & Miller, 1992). Prevention efforts would benefit from research identifying those assets specifically associated with prescription drug use and abuse. Relevant assets would likely be classified into the psychosocial (e.g., depression, self-worth, decision-making, positive outlook), individual (e.g., physical activities, hobbies, housework), school (e.g., school connectedness), and family (e.g., parental expectations for education, parental closeness, overall relationship with parents) domains.

Recommendations for Practice

1. Educate students about the dangers associated with sharing their own prescriptions or prescriptions obtained from other sources with their peers. Considering that *friends* were cited most often as sources of prescription drugs for non-medical use, it would be wise to place heightened emphasis on the risks and consequences associated with sharing or accepting prescription from peers even if they are a trusted friends. Messages designed for this purpose could be disseminated through school-based drug education curricula or during school orientation sessions when general school policies are introduced to the students.
2. Educate parents, and other family members on dangers of providing prescription drugs to youth without a physician's prescription. Second only to friends, parents and were readily cited as sources of prescription drugs for non-medical use. Parents should be provided with strategies to safeguard prescription medications at home from their children; refrain from conveying messages or actions that may condone the casual use of prescription drugs in the household; monitor their children's use of controlled prescription drugs; and refrain from administering

prescription drugs to their children without a doctor's prescription. Parent education measures can be disseminated through a number of vehicles such as public service announcements or by "piggy-backing" on federally or locally sponsored campaigns that focus on youth alcohol, marijuana or illicit drug use. Parents can also be reached through school and community forums such as back to school night, town hall meetings, or PTSA meetings.

3. Train physicians, pharmacists, or other appropriate healthcare providers to monitor prescribing and distribution practices to minimize diversion; identify patients who maybe diverting or abusing prescription drugs; and educate their clients about the dangers associated with improper use and sharing their prescription drugs. Although most students did not cite doctor's offices or pharmacies as a source prescription drugs for non-medical use, most drugs are likely originally diverted from these sources.
4. Assure access to appropriate treatment for teenagers for whom prescription drug abuse is part of a larger problem of illicit drug and often, polydrug use. In addition to recognizing prescription drug abuse as a larger problem of drug use, treatment programs/interventions should also address co-occurring disorders that compromise the health of adolescents such as social deviance, depression or eating disorders.
5. Refine measures on national surveys and reporting in the research literature so consistent terminology in referring to non-medical prescription drug use, misuse, and abuse is used. Throughout the course of this research study, I encountered varied definitions for the use of prescription drug that was unapproved by a doctor

or used for recreational purposes. *Non-medical use*, *misuse*, and *abuse* have distinct meanings though they are often used interchangeably in the literature.

6. Advocate for the expansion of the YRBS to include the non-medical prescription drug use items designed for this study. Although other national surveillance systems monitor non-medical prescription drug use (e.g., National Survey on Drug Use and Health, Monitoring the Future) the U.S., states and local communities largely rely on the YRBS for monitoring health-risk behaviors which contribute to the leading causes of morbidity and mortality among youth and young adults. Bearing in mind that the prevalence of non-medical prescription drug use ranks second, only after marijuana, it would be prudent for the U.S. Centers for Disease Control and Prevention to recognize non-medical prescription drug use along with the use of other licit and illicit drugs as a youth risk behavior.

Conclusion

Findings from the current study confirm that valid and reliable measures of non-medical prescription drug use can be feasibly integrated into surveys that assess multiple risk behaviors among youth, namely the Youth Risk Behavior Survey. While the U.S. has made great strides in controlling increases in tobacco, alcohol, and illicit drug use in recent years, the non-medical use and abuse of prescription pain relievers, depressants, and stimulants remain a problem. The reasonable first step to curb the recent increase in non-medical prescription drug use is to improve surveillance systems by introducing valid and reliable items assessing prescription drug use and abuse prevalence. By obtaining these estimates over time on federal surveys of multiple youth risk behaviors,

we will be in a better position to inform policy, prevention and treatment methods related to prescription drug use and abuse.

APPENDIX A
SANTA ROSA COUNTY FINAL QUESTIONNAIRE

The Santa Rosa County
Health Behavior Survey

General Instructions

This survey is about health behavior. It has been developed so you can tell us what you do that may affect your health. The information you give will be used to develop better health education for young people like yourself.

DO NOT write your name on this survey or the answer sheet provided. The answers you give will be kept private. No one will know what you write. Answer the questions based on what you really do.

Completing this survey is voluntary. Whether or not you answer the questions will not affect your grade in this class. There are no right or wrong answers. If you are not comfortable answering a question, just leave it blank.

The questions that ask about your background will be used only to describe the types of students completing the survey. The information will not be used to find out your name. No names will ever be reported.

Make sure you read every question. Fill in the ovals on the answer sheet completely. When you are finished, follow the instructions of the person giving you the survey.

Thanks for your help!

DIRECTIONS:

- Choose only one answer for each question.
- Use a #2 pencil only.
- Make dark marks.
- Fill in the oval on your answer sheet that matches the letter of your answer.
- Erase completely to change your answer.

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1. How old are you?
   A. 12 years old or younger
   B. 13 years old
   C. 14 years old
   D. 15 years old
   E. 16 years old
   F. 17 years old
   G. 18 years old

2. What is your sex?
   A. Female
   B. Male

3. In what grade are you?
   A. 9th grade
   B. 10th grade
   C. 11th grade
   D. 12th grade
   E. Ungraded or other grade

4. How do you describe yourself? (Select only **one** response)
   A. American Indian or Alaska Native
   B. Asian
   C. Black or African-American
   D. Hispanic or Latino
   E. Native Hawaiian or Other Pacific Islander
   F. White
   G. Other

5. Which of the following schools do you attend?
   A. High School 1
   B. High School 2
   C. High School 3

6. How do you describe your health in general?
   A. Excellent
   B. Very good
   C. Good
   D. Fair
   E. Poor

The next 4 questions ask about personal safety.

7. **When you rode a bicycle** during the past 12 months, how often did you wear helmet?
   A. I did not ride a bicycle during the past 12 months
   B. Never wore a helmet
   C. Rarely wore a helmet
   D. Sometimes wore a helmet
   E. Most of the time wore a helmet
   F. Always wore a helmet

8. How often do you wear a seat belt when **riding in** a car driven by someone else?
   A. Never
   B. Rarely
   C. Sometimes
   D. Most of the time
   E. Always

9. During the past 30 days, how many times did you **ride** in a car or other vehicle **driven by someone who had been drinking alcohol**?
   A. 0 times
   B. 1 time
   C. 2 or 3 times
   D. 4 or 5 times
   E. 6 or more times

10. During the past 30 days, how many times did you **drive** a car or other vehicle **when you had been drinking alcohol**?
    A. 0 times
    B. 1 time
    C. 2 or 3 times
    D. 4 or 5 times
    E. 6 or more times

The next 11 questions ask about violence-related behaviors.

11. During the past 30 days, on how many days did you carry **a weapon** such as a gun, knife, or club?
    A. 0 days
    B. 1 day
    C. 2 or 3 days
    D. 4 or 5 days
    E. 6 or more days

12. During the past 30 days, on how many days did you carry **a gun**?
    A. 0 days
    B. 1 day
    C. 2 or 3 days
    D. 4 or 5 days
    E. 6 or more days

13. During the past 30 days, on how many days did you carry a weapon such as a gun, knife, or club **on school property**?
    A. 0 days
    B. 1 day
    C. 2 or 3 days
    D. 4 or 5 days
    E. 6 or more days

14. During the past 30 days, on how many days did you **not** go to school because you felt you would be unsafe at school or on your way to or from school?
    A. 0 days
    B. 1 day
    C. 2 or 3 days
    D. 4 or 5 days
    E. 6 or more days

15. During the past 12 months, how many times has someone threatened or injured you with a weapon such as a gun, knife, or club **on school property**?
    A. 0 times
    B. 1 time
    C. 2 or 3 times
    D. 4 or 5 times
    E. 6 or 7 times
    F. 8 or 9 times
    G. 10 or 11 times
    H. 12 or more times

16. During the past 12 months, how many times has someone stolen or deliberately damaged your property such as a car, clothing, or books **on school property**?
    A. 0 times
    B. 1 times
    C. 2 or 3 times
    D. 4 or 5 times
    E. 6 or 7 times
    F. 8 or 9 times
    G. 10 or 11 times
    H. 12 or more times

17. During the past 12 months, how many times were you in a physical fight?
    A. 0 times
    B. 1 time
    C. 2 or 3 times
    D. 4 or 5 times
    E. 6 or 7 times
    F. 8 or 9 times
    G. 10 or 11 times
    H. 12 or more times

18. During the past 12 months, how many times were you in a physical fight in which you were injured and had to be treated by a doctor or nurse?
    A. 0 times
    B. 1 time
    C. 2 or 3 times
    D. 4 or 5 times
    E. 6 or more times

19. During the past 12 months, how many times were you in a physical fight **on school property**?
    A. 0 times
    B. 1 time
    C. 2 or 3 times
    D. 4 or 5 times
    E. 6 or 7 times
    F. 8 or 9 times
    G. 10 or 11 times
    H. 12 or more times

20. During the past 12 months, did your boyfriend or girlfriend ever hit, slap, or physically hurt you on purpose?
    A. Yes
    B. No

21. Have you ever been forced to have sexual intercourse when you did not want to?
    A. Yes
    B. No

The next 5 questions ask about sad feelings and attempted suicide. Sometimes people feel so depressed about the future that they may consider attempting suicide, that is, taking some action to end their own life.

22. During the past 12 months, did you ever feel so sad or hopeless almost every day for **two weeks or more in a row** that you stopped doing some usual activities?
    A. Yes
    B. No

23. During the past 12 months, did you ever **seriously** consider attempting suicide?
    A. Yes
    B. No

24. During the past 12 months, did you make a plan about how you would attempt suicide?
    A. Yes
    B. No

25. During the past 12 months, how many times did you actually attempt suicide?
    A. 0 times
    B. 1 time
    C. 2 or 3 times
    D. 4 or 5 times
    E. 6 or more times

26. **If you attempted suicide** during the past 12 months, did any attempt result in an injury, poisoning, or overdose that had to be treated by a doctor or nurse?
    A. **I did not attempt suicide** during the past 12 months.
    B. Yes
    C. No

The next 12 questions ask about tobacco use.

27. Have you ever tried cigarette smoking, even one or two puffs?
    A. Yes
    B. No

28. How old were you when you smoked a whole cigarette for the first time?
    A. I have never smoked a whole cigarette
    B. 8 years old or younger
    C. 9 or 10 years old
    D. 11 or 12 years old
    E. 13 or 14 years old
    F. 15 or 16 years old
    G. 17 years old or older

29. During the past 30 days, on how many days did you smoke cigarettes?
    A. 0 days
    B. 1 or 2 days
    C. 3 to 5 days
    D. 6 to 9 days
    E. 10 or 19 days
    F. 20 to 29 days
    G. All 30 days

30. During the past 30 days, on the days you smoked, how many cigarettes did you smoke **per day**?
    A. I did not smoke cigarettes during the past 30 days
    B. Less than 1 cigarette per day
    C. 1 cigarette per day
    D. 2 to 5 cigarettes per day
    E. 6 to 10 cigarettes per day
    F. 11 to 20 cigarettes per day
    G. More than 20 cigarettes per day

31. During the past 30 days, how did you **usually** get your own cigarettes? (Select only **one** response).
    A. I did not smoke cigarettes during the past 30 days
    B. I bought them in a store such as a convenience store, supermarket or gas station
    C. I bought them from a vending machine
    D. I gave someone else money to buy them for me
    E. I borrowed (or bummed) them from someone else
    F. A person 18 years old or older gave them to me
    G. I took them from a store or family member
    H. I got them some other way

32. During the past 30 days, on how many days did you smoke cigarettes **on school property**?
    A. 0 days
    B. 1 or 2 days
    C. 3 to 5 days
    D. 6 to 9 days
    E. 10 or 19 days
    F. 20 to 29 days
    G. All 30 days

33. Have you ever smoked cigarettes regularly, that is, at least one cigarette every day for 30 days?
    A. Yes
    B. No

34. During the past 12 months, did you ever try **to quit** smoking cigarettes?
    A. I did not smoke during the past 12 months
    B. Yes
    C. No

35. During the past 30 days, on how many days did you use **chewing tobacco, snuff,** or **dip**, such as Redman, Levi Garret, Beechnut, Skoal, Skoal Bandits, or Copenhagen?
    A. 0 days
    B. 1 or 2 days
    C. 3 to 5 days
    D. 6 to 9 days
    E. 10 or 19 days
    F. 20 to 29 days
    G. All 30 days

36. During the past 30 days, on how many days did you use **chewing tobacco, snuff,** or **dip on school property**?
    A. 0 days
    B. 1 or 2 days
    C. 3 to 5 days
    D. 6 to 9 days
    E. 10 or 19 days
    F. 20 to 29 days
    G. All 30 days

37. During the past 30 days, on how many days did you smoke **cigars, cigarillos, or little cigars**?
    A. 0 days
    B. 1 or 2 days
    C. 3 to 5 days
    D. 6 to 9 days
    E. 10 or 19 days
    F. 20 to 29 days
    G. All 30 days

The next 5 questions ask about drinking alcohol. This includes beer, wine, wine coolers, and liquor such as rum, gin, vodka, or whiskey. For these questions, drinking alcohol does not include drinking a few sips of wine for religious purposes.

38. During your life, on how many days have you had at least one drink of alcohol?
    A. 0 days
    B. 1 or 2 days
    C. 3 to 9 days
    D. 10 to 19 days
    E. 20 to 39 days
    F. 40 to 99 days
    G. 100 or more days

39. How old were you when you had your first drink of alcohol other than a few sips?
    A. I have never had a drink of alcohol other than a few sips
    B. 8 years old or younger
    C. 9 or 10 years old
    D. 11 or 12 years old
    E. 13 or 14 years old
    F. 15 or 16 years old
    G. 17 years old or older

40. During the past 30 days, on how many days did you have at least one drink of alcohol?
    A. 0 days
    B. 1 or 2 days
    C. 3 to 5 days
    D. 6 to 9 days
    E. 10 to 19 days
    F. 20 to 29 days
    G. All 30 days

41. During the past 30 days, on how many days did you have 5 or more drinks of alcohol in a row, that is, within a couple of hours?
    A. 0 days
    B. 1 or 2 days
    C. 3 to 5 days
    D. 6 to 9 days
    E. 10 to 19 days
    F. 20 to 29 days
    G. All 30 days

42. During the past 30 days, on how many days did you have at least one drink of alcohol **on school property**?
    A. 0 days
    B. 1 or 2 days
    C. 3 to 5 days
    D. 6 to 9 days
    E. 10 to 19 days
    F. 20 to 29 days
    G. All 30 days

The next 4 questions ask about marijuana use. Marijuana also is called grass or pot.

43. During your life, how many times have you used marijuana?
    A. 0 times
    B. 1 or 2 times
    C. 3 to 9 times
    D. 10 to 19 times
    E. 20 to 39 times
    F. 40 to 99 times
    G. 100 or more times

44. How old were you when you tried marijuana for the first time?
    A. I have never tried marijuana
    B. 8 years old or younger
    C. 9 or 10 years old
    D. 11 or 12 years old
    E. 13 or 14 years old
    F. 15 or 16 years old
    G. 17 years old or older

45. During the past 30 days, how many times did you use marijuana?
    A. 0 times
    B. 1 or 2 times
    C. 3 to 9 times
    D. 10 to 19 times
    E. 20 to 39 times
    F. 40 or more times

46. During the past 30 days, how many times did you use marijuana **on school property**?
    A. 0 times
    B. 1 or 2 times
    C. 3 to 9 times
    D. 10 to 19 times
    E. 20 to 39 times
    F. 40 or more times

The next 6 questions ask about <u>prescription pain relievers</u>, which doctors sometimes prescribe after surgery or when someone is in a lot of pain. Prescription pain relievers include drugs such as: Vicodin, OxyContin, Percocet, Percodan, Codeine (Tylenol 3 & 4), Fentanyl, Darvon, Demerol, Dilaudid, Morphine and Methadone. They are sometimes called *Painkillers*, *Pain pills, Oxies, Percs, Perc-a-pops, Miss Emma, Hillbilly Heroin or Demmies.*

47. During your life, how many times have you used a <u>prescription pain reliever</u> that was **NOT** prescribed to you or you took only for the feeling it caused?
    A. 0 times
    B. 1 or 2 times
    C. 3 to 9 times
    D. 10 to 19 times
    E. 20 to 39 times
    F. 40 to 99 times
    G. 100 or more times

48. How old were you when you first tried a <u>prescription pain reliever</u> that was **NOT** prescribed to you or you took only for the feeling it caused?
    A. **I have never** used a prescription pain reliever in a way not prescribed for me
    B. 8 years old or younger
    C. 9 or 10 years old
    D. 11 or 12 years old
    E. 13 or 14 years old
    F. 15 or 16 years old
    G. 17 years old or older

49. During the past 30 days, how many times did you use a prescription pain reliever that was **NOT** prescribed to you or you took only for the feeling it caused?
    A. 0 times
    B. 1 or 2 times
    C. 3 to 9 times
    D. 10 to 19 times
    E. 20 to 39 times
    F. 40 to 99 times
    G. 100 or more times

50. During the past 30 days, how many times did you use a prescription pain reliever that was **NOT** prescribed to you or you took only for the feeling it caused **on school property**?
    A. 0 times
    B. 1 or 2 times
    C. 3 to 9 times
    D. 10 to 19 times
    E. 20 to 39 times
    F. 40 to 99 times
    G. 100 or more times

51. Where did you usually get the prescription pain reliever you used in a way **NOT** prescribed for you? (Please select only **one**)
    A. **I have never** used a prescription pain reliever in a way not prescribed for me
    B. I took my own prescription pain reliever; but in a way *not* prescribed for me
    C. From a parent or guardian *with* their permission
    D. From a parent or guardian *without* their permission
    E. From a brother or sister
    F. From another relative (grandparent, aunt, uncle, cousin, etc.)
    G. From a friend
    H. From a pharmacy or doctor's office (stolen or forged prescription)
    I. From the Internet
    J. Other

52. Why did you use the prescription pain reliever in a way **NOT** prescribed for you? (Please select the **one** most important reason)
    A. **I have never** used a prescription pain reliever in a way not prescribed for me
    B. To experiment
    C. To get buzzed, high, stoned, or wasted
    D. To fit in
    E. To get away from my problems
    F. To alter the effects of other drugs (including alcohol)
    G. To relax or relieve stress
    H. To help me sleep
    I. To relieve physical pain
    J. Other

The next 6 questions are about prescription depressant drugs, which doctors sometimes prescribe to calm people down, relax their muscles, or help people sleep. Prescription depressants include drugs such as: Valium, Xanax, Halcion, Librium, Ativan, Ambien, ProSom, Seconal, Nembutal and Lunesta. They are sometimes called *Nerve pills, Downers, Downs, Sleepers, Barbs, Benos, Stumblers or Zanibars*.

53. During your life, how many times have you used a prescription depressant that was **NOT** prescribed to you or you took only for the feeling it caused?
    A. 0 times
    B. 1 or 2 times
    C. 3 to 9 times
    D. 10 to 19 times
    E. 20 to 39 times
    F. 40 to 99 times
    G. 100 or more times

54. How old were you when you first tried a prescription depressant that was **NOT** prescribed to you or you took only for the feeling it caused?
    A. **I have never** used a prescription depressant in a way not prescribed for me
    B. 8 years old or younger
    C. 9 or 10 years old
    D. 11 or 12 years old
    E. 13 or 14 years old
    F. 15 or 16 years old
    G. 17 years old or older

55. During the past 30 days, how many times did you use a prescription depressant that was **NOT** prescribed to you or you took only for the feeling it caused?
    A. 0 times
    B. 1 or 2 times
    C. 3 to 9 times
    D. 10 to 19 times
    E. 20 to 39 times
    F. 40 to 99 times
    G. 100 or more times

56. During the past 30 days, how many times did you use a prescription depressant that was **NOT** prescribed to you or you took only for the feeling it caused **on school property**?
    A. 0 times
    B. 1 or 2 times
    C. 3 to 9 times
    D. 10 to 19 times
    E. 20 to 39 times
    F. 40 to 99 times
    G. 100 or more times

57 Where did you usually get the prescription depressant you used in a way **NOT** prescribed for you? (Please select only **one**)
    A. **I have never** used a prescription depressant in a way not prescribed for me
    B. I took my own prescription depressant; but in a way *not* prescribed for me
    C. From a parent or guardian *with* their permission
    D. From a parent or guardian *without* their permission
    E. From a brother or sister
    F. From another relative (grandparent, aunt, uncle, cousin, etc.)
    G. From a friend
    H. From a pharmacy or doctor's office (stolen or forged prescription)
    I. From the Internet
    J. Other

58. Why did you use the prescription depressant in a way **NOT** prescribed for you? (Please select the **one** most important reason)
    A. **I have never** used a prescription depressant in a way not prescribed for me
    B. To experiment
    C. To get buzzed, high, stoned, or wasted
    D. To fit in
    E. To get away from my problems
    F. To alter the effects of other drugs (including alcohol)
    G. To relax or relieve stress
    H. To help me sleep
    I. To relieve physical pain
    J. Other

The next 6 questions are about prescription stimulant drugs, which doctors sometimes prescribe to treat attention-deficit hyperactivity disorder (ADHD) or depression, help people stay awake, or help people lose weight. Prescription stimulants include drugs such as: Ritalin, Concerta, Adderall, Dexedrine, Meridia, and Benzedrine. They are sometimes also called *Uppers, Speed* or *Pep Pills*.

59. During your life, how many times have you used a prescription stimulant that was **NOT** prescribed to you or you took only for the feeling it caused?
    A. 0 times
    B. 1 or 2 times
    C. 3 to 9 times
    D. 10 to 19 times
    E. 20 to 39 times
    F. 40 to 99 times
    G. 100 or more times

60. How old were you when you first tried a prescription stimulant that was **NOT** prescribed to you or you took only for the feeling it caused?
    A. **I have never** used a prescription stimulant in a way not prescribed for me
    B. 8 years old or younger
    C. 9 or 10 years old
    D. 11 or 12 years old
    E. 13 or 14 years old
    F. 15 or 16 years old
    G. 17 years old or older

61. During the past 30 days, how many times did you use a prescription stimulant that was **NOT** prescribed to you or you took only for the feeling it caused?
    A. 0 times
    B. 1 or 2 times
    C. 3 to 9 times
    D. 10 to 19 times
    E. 20 to 39 times
    F. 40 to 99 times
    G. 100 or more times

62. During the past 30 days, how many times did you use a prescription stimulant that was **NOT** prescribed to you or you took only for the feeling it caused **on school property**?
    A. 0 times
    B. 1 or 2 times
    C. 3 to 9 times
    D. 10 to 19 times
    E. 20 to 39 times
    F. 40 to 99 times
    G. 100 or more times

63. Where did you usually get the prescription stimulant you used in a way **NOT** prescribed for you? (Please select only **one**)
    A. **I have never** used a prescription stimulant in a way not prescribed for me
    B. I took my own prescription stimulant; but in a way *not* prescribed for me
    C. From a parent or guardian *with* their permission
    D. From a parent or guardian *without* their permission
    E. From a brother or sister
    F. From another relative (grandparent, aunt, uncle, cousin, etc.)
    G. From a friend
    H. From a pharmacy or doctor's office (stolen or forged prescription)
    I. From the Internet
    J. Other

64. Why did you use the prescription stimulant in a way **NOT** prescribed for you? (Please select the **one** most important reason)
    A. **I have never** used a prescription stimulant in a way not prescribed for me
    B. To experiment
    C. To get buzzed, high, stoned or wasted
    D. To fit in
    E. To get away from my problems
    F. To alter the effects of other drugs (including alcohol)
    G. To get more energy or stay awake longer
    H. To help me concentrate or study
    I. To help me lose weight
    J. Other

The next 9 questions ask about other drugs.

65. During your life, how many times have you used **any** form of cocaine, including powder, crack, or freebase?
    A. 0 times
    B. 1 or 2 times
    C. 3 to 9 times
    D. 10 to 19 times
    E. 20 to 39 times
    F. 40 or more times

66. During the past 30 days, how many times have you used **any** form of cocaine, including powder, crack, or freebase?
    A. 0 times
    B. 1 or 2 times
    C. 3 to 9 times
    D. 10 to 19 times
    E. 20 to 39 times
    F. 40 or more times

67. During your life, how many times have you sniffed glue, or breathed the contents of aerosol spray cans, or inhaled any paints or sprays to get high?
    A. 0 times
    B. 1 or 2 times
    C. 3 to 9 times
    D. 10 to 19 times
    E. 20 to 39 times
    F. 40 or more times

68. During your life, how many times have you used **heroin** (also called smack, junk, or China White)?
    A. 0 times
    B. 1 or 2 times
    C. 3 to 9 times
    D. 10 to 19 times
    E. 20 to 39 times
    F. 40 or more times

69. During your life, how many times have you used **methamphetamines** (also called speed, crystal, crank, or ice)?
    A. 0 times
    B. 1 or 2 times
    C. 3 to 9 times
    D. 10 to 19 times
    E. 20 to 39 times
    F. 40 or more times

70. During your life, how many times have you used **ecstasy** (also called MDMA)?
    A. 0 times
    B. 1 or 2 times
    C. 3 to 9 times
    D. 10 to 19 times
    E. 20 to 39 times
    F. 40 or more times

71. During your life, how many times have you taken **steroid pills or shots** without a doctor's prescription?
    A. 0 times
    B. 1 or 2 times
    C. 3 to 9 times
    D. 10 to 19 times
    E. 20 to 39 times
    F. 40 or more times

72. During your life, how many times have you used a needle to inject any **illegal** drug into your body?
    A. 0 times
    B. 1 time
    C. 2 or more times

73. During the past 12 months, has anyone offered, sold, or given you an illegal drug **on school property**?
    A. Yes
    B. No

The next 7 questions ask about sexual behavior.

74. Have you ever had sexual intercourse?
    A. Yes
    B. No

75. How old were you when you had sexual intercourse for the first time?
    A. I have never had sexual intercourse
    B. 11 years old or younger
    C. 12 years old
    D. 13 years old
    E. 14 years old
    F. 15 years old
    G. 16 years old
    H. 17 years old or older

76. During your life, with how many people have you had sexual intercourse?
    A. I have never had sexual intercourse
    B. 1 person
    C. 2 people
    D. 3 people
    E. 4 people
    F. 5 people
    G. 6 or more people

77. During the past 3 months, with how many people did you have sexual intercourse?
    A. I have never had sexual intercourse
    B. I have had sexual intercourse, but not during the past 3 months
    C. 1 person
    D. 2 people
    E. 3 people
    F. 4 people
    G. 5 people
    H. 6 or more people

78. Did you drink alcohol or use drugs before you had sexual intercourse the **last time**?
    A. I have never had sexual intercourse
    B. Yes
    C. No

79. The **last time** you had sexual intercourse, did you or your partner use a condom?
    A. I have never had sexual intercourse
    B. Yes
    C. No

80. The **last time** you had sexual intercourse, what **one** method did you or your partner use to **prevent pregnancy**? (Select only **one** response).
    A. I have never had sexual intercourse
    B. No method was used to prevent pregnancy
    C. Birth control pills
    D. Condoms
    E. Depo-Provera (injectable birth control)
    F. Withdrawal
    G. Some other method
    H. Not sure

The next 7 questions ask about body weight.

81. How do **you** describe your weight?
    A. Very underweight
    B. Slightly underweight
    C. About the right weight
    D. Slightly overweight
    E. Very overweight

82. Which of the following are you trying to do about your weight?
    A. **Lose** weight
    B. **Gain** weight
    C. **Stay** the same weight
    D. I am **not trying to do anything** about my weight

83. During the past 30 days, did you **exercise** to lose weight or to keep from gaining weight?
    A. Yes
    B. No

84. During the past 30 days, did you **eat less food, fewer calories, or foods low in fat** to lose weight or to keep from gaining weight?
    A. Yes
    B. No

85. During the past 30 days, did you **go without eating for 24 hours or more** (also called fasting) to lose weight or to keep from gaining weight?
    A. Yes
    B. No

86. During the past 30 days, did you **take diet pills, powders, or liquids** without a doctor's advice to lose weight or keep from gaining weight? (Do **not** include meal replacement products such as Slim fast.)
    A. Yes
    B. No

87. During the past 30 days, did you **vomit or take laxatives** to lose weight or to keep from gaining weight?
    A. Yes
    B. No

88. During the past 30 days, did you **take prescription drugs** without a doctor's advice to lose weight or to keep from gaining weight?
    A. Yes
    B. No

The next 7 questions ask about food you ate or drank during the past 7 days. Think about all meals and snacks you had from the time you got up until you went to bed. Be sure to include food you ate at home, at school, at restaurants, or anywhere else.

89. During the past 7 days, how many times did you drink **100% fruit juices** such as orange juice, apple juice, or grape juice? (Do **not** count punch, Kool-Aid, sports drinks, or other fruit-flavored drinks.)
    A. I did not drink 100% fruit juice during the past 7 days
    B. 1 to 3 times during the past 7 days
    C. 4 to 6 times during the past 7 days
    D. 1 time per day
    E. 2 times per day
    F. 3 times per day
    G. 4 or more times per day

90. During the past 7 days, how many times did you eat **fruit**? (Do **not** count fruit juice.)
    A. I did not eat fruit during the past 7 days
    B. 1 to 3 times during the past 7 days
    C. 4 to 6 times during the past 7 days
    D. 1 time per day
    E. 2 times per day
    F. 3 times per day
    G. 4 or more times per day

91. During the past 7 days, how many times did you eat **green salad**?
    A. I did not eat green salad during the past 7 days
    B. 1 to 3 times during the past 7 days
    C. 4 to 6 times during the past 7 days
    D. 1 time per day
    E. 2 times per day
    F. 3 times per day
    G. 4 or more times per day

92. During the past 7 days, how many times did you eat **potatoes**? (Do **not** count french fries, fried potatoes, or potato chips.)
    A. I did not eat potatoes during the past 7 days
    B. 1 to 3 times during the past 7 days
    C. 4 to 6 times during the past 7 days
    D. 1 time per day
    E. 2 times per day
    F. 3 times per day
    G. 4 or more times per day

93. During the past 7 days, how many times did you eat **carrots**?
    A. I did not eat carrots during the past 7 days
    B. 1 to 3 times during the past 7 days
    C. 4 to 6 times during the past 7 days
    D. 1 time per day
    E. 2 times per day
    F. 3 times per day
    G. 4 or more times per day

94. During the past 7 days, how many times did you eat **other vegetables**? (Do **not** count green salad, potatoes, or carrots.)
    A. I did not eat other vegetables during the past 7 days
    B. 1 to 3 times during the past 7 days
    C. 4 to 6 times during the past 7 days
    D. 1 time per day
    E. 2 times per day
    F. 3 times per day
    G. 4 or more times per day

95. During the past 7 days, how many **glasses of milk** did you drink? (Include the milk you drank in a glass or cup, from a carton, or with cereal. Count the half pint of milk served at school as equal to one glass.)
    A. I did not drink milk during the past 7 days
    B. 1 to 3 times during the past 7 days
    C. 4 to 6 times during the past 7 days
    D. 1 time per day
    E. 2 times per day
    F. 3 times per day
    G. 4 or more times per day

The next 7 questions ask about physical activity.

96. On how many of the past 7 days did you exercise or participate in physical activity for **at least 20 minutes that made you sweat and breathe hard**, such as basketball, soccer, running, swimming laps, fast bicycling, fast dancing, or similar aerobic activities?
    A. 0 days
    B. 1 day
    C. 2 days
    D. 3 days
    E. 4 days
    F. 5 days
    G. 6 days
    H. 7 days

97. On how many of the past 7 days did you participate in physical activity for **at least 30 minutes** that did **not** make you sweat or breathe hard, such as fast walking, slow bicycling, skating, pushing a lawn mower, or mopping floors?
    A. 0 days
    B. 1 day
    C. 2 days
    D. 3 days
    E. 4 days
    F. 5 days
    G. 6 days
    H. 7 days

98. During the past 7 days, on how many days were you physically active for a total of **at least 60 minutes per day**? (Add up all the time you spend in any kind of physical activity that increases your heart rate and makes you breathe hard some of the time.)
    A. 0 days
    B. 1 day
    C. 2 days
    D. 3 days
    E. 4 days
    F. 5 days
    G. 6 days
    H. 7 days

99. On an average school day, how many hours do you watch TV?
    A. I do not watch TV on an average school day
    B. Less than 1 hour per day
    C. 1 hour per day
    D. 2 hours per day
    E. 3 hours per day
    F. 4 hours per day
    G. 5 or more hours per day

100. In an average week when you are in school, on how many days do you go to physical education (PE) classes?
    A. 0 days
    B. 1 day
    C. 2 days
    D. 3 days
    E. 4 days
    F. 5 days

101. During an average physical education (PE) class, how many minutes do you spend actually exercising or playing sports?
    A. I do not take PE
    B. Less than 10 minutes
    C. 10 to 20 minutes
    D. 21 to 30 minutes
    E. 31 to 40 minutes
    F. 41 to 50 minutes
    G. 51 to 60 minutes
    H. More than 60 minutes

102. During the past 12 months, on how many sports teams did you play? (Include any teams run by your school or community groups).
    A. 0 teams
    B. 1 team
    C. 2 teams
    D. 3 or more teams

Were any questions on this survey confusing to you or hard to answer? Please tell us which questions were confusing and why in the <u>orange comment box</u> on the back of your answer sheet.

This is the end of the survey.
Thanks for your help!

APPENDIX B
LIST OF EXPERT PANEL REVIEWERS FOR INSTRUMENT ASSESSMENT

April 2006

1. Paul L. Doering, M.S.
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APPENDIX C
EXPERT PANEL EMAIL COVER LETTER

UNIVERSITY OF FLORIDA

Dear Dr. Haddox:

Thanks for agreeing to serve as a member of my expert panel for my dissertation research. You were selected because of your professional expertise in areas directly related to my study.

Your task is to review 12 initial items designed to measure the prevalence of non-medical prescription drug use, which will be embedded in the 2005 Youth Risk Behavior Survey as part of a larger study.

Attached you will find an abstract of my dissertation topic. (See *Morris* below.) This abstract describes the purposes, significance, procedures, and anticipated outcomes of my overall study. The abstract might provide you a context for reviewing the 12 proposed items. You will also find a copy of the 12 items. (See *Items* below.) Please use this document as a reference during your assessment.

To conduct your review, please go the **Rx Drug Expert Review Panel** website by clicking on http://express.perseus.com/perseus/surveys/1734848031/2e385e0c.htm. This website contains the instructions and procedures for conducting your review, and an on-line form for recording your ratings and providing feedback.

I hope you can complete your online assessment by Wednesday, February 22, 2006. If you have any questions about your task or have any problems opening the attached documents or executing web-based assessment, please contact me by email or by telephone at 850.944.8693 (home), or 305.726.6673 (cell).

Again, I thank for your time and effort in serving as a panel review member. I look forward to receiving your evaluation and comments!

Sincerely yours,

Melissa C. Morris, M.P.H., C.H.E.S.
Ph.D. Candidate

Attachments:

Morris, M. C. (2006). ABSTRACT: "Measuring Non-Medical Prescription Drug Use and Associated Risk-Taking Behaviors"

Items, Non-Medical Prescription Drug Use.

APPENDIX D
ABSTRACT OF THE PROPOSED STUDY

MEASURING NON-MEDICAL PRESCRIPTION DRUG USE AND ASSOCIATED RISK-TAKING BEHAVIORS

STATEMENT OF THE PROBLEM: While rates of illicit drug, alcohol, and tobacco use have declined among adolescents in recent years, non-medical prescription drug use has risen. Non-medical prescription drug use has been defined as the use of drug that was not prescribed for you or that was taken only for the experience or feeling it caused (Substance Abuse and Mental Health Services Administration (SAMHSA, 2004). Reports indicate that close to 14% of youth ages 12-17 have used prescription drugs non-medically in their lifetime, and each year close to half of non-medical prescription drug use initiates are under the age of 18. When placed into perspective relative to other types of youth substance use, the non-medical use of prescription drugs use ranks fourth, after alcohol, cigarettes, and marijuana, respectively.

Both theory and research suggest that drug taking behaviors are not isolated events in the lives of adolescents. Findings from empirical studies suggest that teens who use prescription drugs for non-medical purposes are more likely to engage in multiple substance use behaviors. Few studies however, have investigated the relationship between non-medical prescription drug use and other health risk behaviors including those related to accidental injury and violence, sexual experience, suicide and depression, decreased physical activity, and use of problem weight loss practices.

PURPOSES OF THE STUDY: This investigation will examine the nature of non-medical prescription drug use using a modified version of the CDC's Youth Risk Behavior Survey (YRBS). The purposes of the study are to: (1) design reliable and valid measures of non-medical prescription drug use to be incorporated into the YRBS; (2) describe the relationships between non-medical prescription drug use and other adolescent risk behaviors; (3) raise awareness among public health professionals and key stakeholders about risks of non-medical prescription drug use among adolescents; (4) improve monitoring and tracking systems by encouraging the inclusion of prescription drug items in surveys that monitor drug use and youth risk behaviors; and (5) inform policy, prevention, and treatment measures related to non-medical prescription drug use.

SIGNIFICANCE OF THE STUDY: Although there is considerable research on adolescent substance use, limited data exist on the non-medical use of prescription drugs. To better inform policy, prevention, and treatment initiatives, it has been suggested that national surveys of drug use should include specific items that measure non-medical prescription drug use. One such survey is the CDC's YRBS. Only after fully understanding the scope, severity, and correlates of non-medical prescription drug use

among adolescents, will health education and prevention specialists be able to tailor interventions that address prescription drugs as part of the larger problem of drug abuse.

SUMMARY OF PROCEDURES: This study will take place in three stages and will include: (1) an expert panel review (2) pilot testing of new instrument items and (3) administration of the revised instrument. I will first enlist a panel of experts who will use guidelines to establish content validity, and appropriateness of the survey items for the target population. The "experts" chosen to conduct the review will be professionals with expertise in the area of study, measurement specialists, or those familiar with the target audience. If necessary, the newly developed items will be revised based on expert panel feedback.

The pilot study will serve two functions: to test the procedures used for administration of the modified YRBS; and to assess test-retest reliability of the newly constructed items. For the pilot, I will collect data using a version of the 2005 YRBS expanded to include 12 items assessing non-medical use of the three major classes of abusable prescription drugs: opioid pain relievers, stimulants, and depressants. The modified survey, which will include a total of 97 items, will be administered to a convenience sample of 200 students from a Florida public high school on two occasions, approximately two weeks apart. Teachers serving as proctors will receive a brief instructional session describing the study and the protocol designed for collecting data. Upon completion of the pilot study, reliability will be assessed upon kappa coefficient determination. If necessary, modification to the procedures and instrument will be made based on findings from the pilot study.

For the main study, the survey will be administered to the entire population of a single Florida public high-school (different from the pilot) in a format similar to that for the pilot study. As in the pilot study, teachers, who will serve as proctors, will receive a brief instructional session describing the study and the protocol designed for collecting data. These steps will be taken to ensure uniformity in conducting the survey. Considerable attention and emphasis will be placed on ensuring anonymity, privacy, and confidentiality among all student respondents. Upon completion of the final administration, inferential statistics will be used to examine the relationship (if any) among non-medical prescription drug use and other adolescent health risk behaviors. The dependent variable, non-medical prescription drug use, will be measured using a dichotomized composite score of prevalence items that correspond to the three major classes of abusable prescription drugs. The independent variables will include tobacco, alcohol, and marijuana use; other illicit drug use including cocaine/crack, inhalants, heroin, methamphetamine, and ecstasy; violence-related behaviors; sadness ideation and suicide attempts; sexual risk taking; and the use of problem weight tactics.

ANTICIPATED OUTCOMES: As a result of the study, I anticipate the following outcomes: (1) there will be a significant difference in adolescent non-medical prescription drug use based on selected demographics, (2) adolescent students who engage in non-medical prescription drug use are more likely to take part in drug-taking behaviors than those students who do not engage in non-medical prescription drug use, (3) students who participate in non-medical prescription drug use are more likely to take part in other health risk behaviors (i.e., accidental injury and violence, sexual experience,

suicide and depression, decreased physical activity, and use of problem weight loss practices) than those students who do not engage in non-medical prescription drug use.

Melissa C. Morris, M.P.H., C.H.E.S.
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APPENDIX E
PRELIMINARY ITEMS FOR EXPERT PANEL REVIEW

Section A: Prescription Pain Relievers

The next 4 questions are about pain relievers, which doctors sometimes prescribe after surgery or when someone is in a lot of pain. People are only supposed to take prescription pain relievers if they have a prescription from a doctor for them. Prescription pain relievers are sometimes called *Pain pills, Oxies, Percs, Hillbilly heroin, or Demmies.* They include drugs such as: Vicodin, OxyContin, Percocet, Percodan, Codeine (Tylenol 3 & 4), Darvon, Demerol, Dilaudid, Morphine, Methadone. In the answers you provide, we are only interested in your use of prescription pain relievers if the drug was NOT prescribed to you or you took the drug only for the experience or feeling it caused. We are not interested in your use of "over-the-counter" pain relievers such as aspirin, Tylenol, or Advil that can be bought in drug stores or grocery stores without a doctor's prescription.

1. During your life, how many times have you used a prescription pain reliever that was not prescribed to you or you took only for the feeling it caused?
   A. 0 times
   B. 1 or 2 times
   C. 3 to 9 times
   D. 10 to 19 times
   E. 20 to 39 times
   F. 40 to 99 times
   G. 100 or more times

2. How old were you when you first tried a prescription pain reliever not prescribed to you or you took only for the feeling it caused?
   A. I have never used a prescription pain reliever in a way not prescribed for me by a doctor
   B. 8 years old or younger
   C. 9 or 10 years old
   D. 11 or 12 years old
   E. 13 or 14 years old
   F. 15 or 16 years old
   G. 17 years old or older

3. During the past 30 days, how many times did you use a prescription pain reliever that was not prescribed to you or you took only for the feeling it caused?
   A. 0 times
   B. 1 or 2 times
   C. 3 to 9 times
   D. 10 to 19 times
   E. 20 to 39 times
   F. 40 or more times

4. During the past 30 days, how many times did you use a prescription pain reliever not prescribed to you or you took only for the feeling it caused on school property?
   A. 0 times
   B. 1 or 2 times
   C. 3 to 9 times
   D. 10 to 19 times
   E. 20 to 39 times
   F. 40 or more times

Section B: Prescription Depressants

The next 4 questions are about use of depressant drugs, which doctors sometimes prescribe to calm people down, relax their muscles, or help people sleep. People are only supposed to take prescription depressants if they have a prescription from a doctor for them. Prescription depressants are sometimes called *Nerve pills, Downs, Downers, Sleepers, Barbs, Benzos, or Stumblers*. They include drug such as: Valium, Xanax, Halcion, Librium, Ativan, Ambien, ProSom, Mebaral, Seconal, Nembutal. In the answers you provide, we are only interested in your use of prescription depressants if the drug was NOT prescribed to you or you took the drug only for the experience or feeling it caused. We are not interested in your use of "over-the-counter" depressants such as Sominex, Unisom, Nytol, or Benadryl that can be bought in drug stores or grocery stores without a doctor's prescription.

5. During your life, how many times have you used a prescription depressant not prescribed to you or you took only for the feeling it caused?
   A. 0 times
   B. 1 or 2 times
   C. 3 to 9 times
   D. 10 to 19 times
   E. 20 to 39 times
   F. 40 to 99 times
   G. 100 or more times

6. How old were you when you tried a prescription depressant that was not prescribed to you or you took only for the feeling it caused?
   A. I have never used a prescription depressant in a way not prescribed for me by a doctor
   B. 8 years old or younger
   C. 9 or 10 years old
   D. 11 or 12 years old
   E. 13 or 14 years old
   F. 15 or 16 years old
   G. 17 years old or older

7. During the past 30 days, how many times did you use a prescription depressant that was not prescribed to you or you took only for the feeling it caused?
   A. 0 times
   B. 1 or 2 times
   C. 3 to 9 times
   D. 10 to 19 times
   E. 20 to 39 times
   F. 40 or more times

8. During the past 30 days, how many times did you use a prescription depressant that was not prescribed to you or you took only for the feeling it caused?
   A. 0 times
   B. 1 or 2 times
   C. 3 to 9 times
   D. 10 to 19 times
   E. 20 to 39 times
   F. 40 or more times

Section C: Prescription Stimulants

The next 4 questions are about use of stimulant drugs, which doctors sometime prescribe to treat attention-deficit hyperactivity disorder (ADHD), stay awake, or help people lose weight. Prescription stimulants are sometimes called *Uppers, Speed, or Pep Pills*. They include drugs such as: Ritalin, Concerta, Adderall, Dexedrine, Meridia, Methedrine, Benzedrine. In the answers you provide, we are only interested in your use of prescription stimulants if the drug was NOT prescribed to you or you took the drug only for the experience or feeling it caused. We are not interested in your use of "over-the-counter" stimulants such as Dexatrim or No-Doz that can be bought in drug stores or grocery stores without a doctor's prescription.

9. During your life, how many times have you used a prescription stimulant that was not prescribed to you or you took only for the feeling it caused?
   A. 0 times
   B. 1 or 2 times
   C. 3 to 9 times
   D. 10 to 19 times
   E. 20 to 39 times
   F. 40 to 99 times
   G. 100 or more times

10. How old were you when you first tried a prescription stimulant that was not prescribed to you or you took only for the feeling it caused?
   A. I have never used a prescription stimulant in a way not prescribed for me by a doctor
   B. 8 years old or younger
   C. 9 or 10 years old
   D. 11 or 12 years old
   E. 13 or 14 years old
   F. 15 or 16 years old
   G. 17 years old or older

11. During the past 30 days, how many times did you use a prescription stimulant that was not prescribed to you or you took only for the feeling it caused?
   A. 0 times
   B. 1 or 2 times
   C. 3 to 9 times
   D. 10 to 19 times
   E. 20 to 39 times
   F. 40 or more times

12. During the past 30 days, how many times did you use a prescription stimulant that was not prescribed to you or you took only for the feeling it caused?
   A. 0 times
   B. 1 or 2 times
   C. 3 to 9 times
   D. 10 to 19 times
   E. 20 to 39 times
   F. 40 or more times

APPENDIX F
EXPERT PANEL REVIEW ITEM ASSESSMENT SURVEY

Expert Panel Review

Dear Reviewer:

For the expert panel review, you will be asked to assess instructions, questions, and response options for 12 items pertaining to non-medical use of prescription drugs. The six criteria to keep in mind are listed below, each with examples of questions to consider.

a. Focus: Are the instructions, questions, etc., focused directly on the issue or topic to be measured?

b. Brevity: Are the instructions, questions, etc., stated as briefly as possible?

c. Clarity: Are the instructions, questions, etc., expressed as clearly and as simply as possible, concerning the type and scope of information wanted, the location for the responses, and the form in which answers are to be given?

d. Readability (vocabulary): Are the words used familiar to the respondents? Are items worded with terminology that is appropriate for respondents?

e. Assurance: Are instructions worded to allay fears, suspicion, embarrassment, or hostility on the part of the respondent? Are instructions worded in an interesting and inviting manner so as to encourage the respondent to participate fully and to respond in an honest manner?

f. Adequacy of Options: Are response options all inclusive, mutually inclusive, and meaningful? Are ample numbers of response options provided to measure the behavior under investigation adequately?

You are not asked to answer the questions as though you were in the role of a student. Rather, please review instructions and items according to the six criteria and your professional expertise. Although I have provided you with a text version of the items for review, please note any comments you might have in the boxes provided on this web-based survey only.

Please click the *Next* button below to continue with the assessment.

Next

Expert Panel Review

Note to Reviewers: Please use this page to comment on instructions for *Section A: Prescription Pain Relievers.*

Section A: Prescription Pain Relievers

The next 4 questions are about pain relievers, which doctors sometimes prescribe after surgery or when someone is in a lot of pain. People are only supposed to take prescription pain relievers if they have a prescription from a doctor for them. Prescription pain relievers are sometimes called Pain pills, Oxies, Percs, Hillbilly heroin, or Demmies. They include drugs such as: Vicodin, OxyContin, Percocet, Percodan, Codeine (Tylenol 3 & 4), Darvon, Demerol, Dilaudid, Morphine, Methadone. In the answers you provide, we are only interested in your use of prescription pain relievers if the drug was NOT prescribed to you or you took the drug only for the experience or feeling it caused. We are not interested in your use of "over-the-counter" pain relievers such as aspirin, Tylenol, or Advil that can be bought in drug stores or grocery stores without a doctor's prescription.

A1. Overall, would you say that instructions for Section *A: Prescription Pain Relievers* are:

	Yes	**No**
a. Focused	☐	☐
b. Brief	☐	☐
c. Clear	☐	☐
d. Readable	☐	☐
e. Assuring	☐	☐

A2. If you checked "No" to any of the above criteria, please write your comments and suggestions for revision below.

A3. Do you believe the slang (e.g., Pain pills, Oxies, Percs, etc.) and trade names (e.g., Vicodin, OxyContin, Percocet, etc.) in this section reasonably represent the universe of names used to describe prescription pain relievers?

- ☐ Yes
- ☐ No
- ☐ Don't Know

A4. If you checked "No" to the above question, please indicate how you would revise the slang and/or trade names below.

A5. Are there any other components of the instructions for *Section A: Prescription Pain Relievers*, that should be omitted, modified, or added? If so, please comment below.

Please click the *Next* button below to continue with the assessment.

Next

Expert Panel Review

Note to Reviewers: Please use this page to comment on items and response options for *Section A: Prescription Pain Relievers.*

1. During your life, how many times have you used a prescription pain reliever that was not prescribed to you or you took only for the feeling it caused?
   A. 0 times
   B. 1 or 2 times
   C. 3 to 9 times
   D. 10 to 19 times
   E. 20 to 39 times
   F. 40 to 99 times
   G. 100 or more times

2. How old were you when you first tried a prescription pain reliever not prescribed to you or you took only for the feeling it caused?
   A. I have never used a prescription pain reliever in a way not prescribed for me by a doctor
   B. 8 years old or younger
   C. 9 or 10 years old
   D. 11 or 12 years old
   E. 13 or 14 years old
   F. 15 or 16 years old
   G. 17 years old or older

3. During the past 30 days, how many times did you use a prescription pain reliever that was not prescribed to you or you took only for the feeling it caused?
   A. 0 times
   B. 1 or 2 times
   C. 3 to 9 times
   D. 10 to 19 times
   E. 20 to 39 times
   F. 40 or more times

4. During the past 30 days, how many times did you use a prescription pain reliever not prescribed to you or you took only for the feeling it caused on school property?
   A. 0 times
   B. 1 or 2 times
   C. 3 to 9 times
   D. 10 to 19 times
   E. 20 to 39 times
   F. 40 or more times

A6. Overall, would you say the questions (1-4) in this section are:

	Yes	No
a. Focused	☐	☐
b. Brief	☐	☐
c. Clear	☐	☐
d. Readable	☐	☐

A7. If you checked "No" to any of the above criteria, please write your comments and suggestions for revisions below.

A8. Overall, would you say the response options (for questions 1-4) in this section are:

	Yes	No
a. Clear	☐	☐
b. Adequate	☐	☐

A9. If you checked "No" to either of the above criteria, please write your comments and suggestions for revision below.

A10. Please use the space below if you have additional comments related to *Section A: Prescription Pain Relievers.*

Please click the *Next* button below to continue with the assessment.

Next

Expert Panel Review

Note to Reviewers: Please use this page to comment on instructions for *Section B: Prescription Depressants.*

Section B: Prescription Depressants

The next 4 questions are about use of depressant drugs, which doctors sometimes prescribe to calm people down, relax their muscles, or help people sleep. People are only supposed to take prescription depressants if they have a prescription from a doctor for them. Prescription depressants are sometimes called Nerve pills, Downs, Downers, Sleepers, Barbs, Benzos, or Stumblers. They include drug such as: Valium, Xanax, Halcion, Librium, Ativan, Ambien, ProSom, Mebaral, Seconal, Nembutal. In the answers you provide, we are only interested in your use of prescription depressants if the drug was NOT prescribed to you or you took the drug only for the experience or feeling it caused. We are not interested in your use of "over-the-counter" depressants such as Sominex, Unisom, Nytol, or Benadryl that can be bought in drug stores or grocery stores without a doctor's prescription.

B1. Overall, would you say that instructions for *Section B: Prescription Depressants* are:

	Yes	**No**
a. Focused	☐	☐
b. Brief	☐	☐
c. Clear	☐	☐
d. Readable	☐	☐
e. Assuring	☐	☐

B2. If you checked "No" to any of the above criteria, please write your comments and suggestions for revision below.

B3. Do you believe the slang (e.g., Nerve pills, Downs, Downers, etc.) and trade names (e.g., Valium, Xanax, Halcion, etc.) used in this section reasonably represent the universe of names used to describe prescription depressants?

- ☐ Yes
- ☐ No
- ☐ Don't Know

B4. If you checked "No" to the above question, please indicate how you would revise the slang and/or trade names below.

B5. Are there any other components of the instructions for *Section B: Prescription Depressants*, that should be omitted, modified, or added? If so, please comment below.

Please click the *Next* button below to continue with the assessment.

Next

Expert Panel Review

Note to Reviewers: Please use this page to comment on items and response options for *Section B: Prescription Depressants.*

5. During your life, how many times have you used a prescription depressant not prescribed to you or you took only for the feeling it caused?
A. 0 times
B. 1 or 2 times
C. 3 to 9 times
D. 10 to 19 times
E. 20 to 39 times
F. 40 to 99 times
G. 100 or more times

6. How old were you when you tried a prescription depressant that was not prescribed to you or you took only for the feeling it caused?
A. I have never used a prescription depressant in a way not prescribed for me by a doctor
B. 8 years old or younger
C. 9 or 10 years old
D. 11 or 12 years old
E. 13 or 14 years old
F. 15 or 16 years old
G. 17 years old or older

7. During the past 30 days, how many times did you use a prescription depressant that was not prescribed to you or you took only for the feeling it caused?
A. 0 times
B. 1 or 2 times
C. 3 to 9 times
D. 10 to 19 times
E. 20 to 39 times
F. 40 or more times

8. During the past 30 days, how many times did you use a prescription depressant that was not prescribed to you or you took only for the feeling it caused on school property?
A. 0 times
B. 1 or 2 times
C. 3 to 9 times
D. 10 to 19 times
E. 20 to 39 times
F. 40 or more times

B6. Overall, would you say the questions (5-8) in this section are:

	Yes	No
a. Focused	☐	☐
b. Brief	☐	☐
c. Clear	☐	☐
d. Readable	☐	☐

B7. If you checked "No" to any of the above criteria, please write your comments and suggestions for revisions below.

B8. Overall, would you say the response options (for questions 5-8) in this section are:

	Yes	No
a. Clear	☐	☐
b. Adequate	☐	☐

B9. If you checked "No" to either of the above criteria, please write your comments and suggestions for revision below.

B10. Please use the space below if you have additional comments related to *Section B: Prescription Depressants*.

Please click the *Next* button below to continue with the assessment.

Next

Expert Panel Review

Note to Reviewers: Please use this page to comment on instructions for *Section C: Prescription Stimulants.*

Section C: Prescription Stimulants

The next 4 questions are about use of stimulant drugs, which doctors sometimes prescribe to treat attention-deficit hyperactivity disorder (ADHD), help people stay awake, or help people lose weight. Prescription stimulants are sometimes called Uppers, Speed, or Pep Pills. They include drugs such as: Ritalin, Concerta, Adderall, Dexedrine, Meridia, Methedrine, Benzedrine. In the answers you provide, we are only interested in your use of prescription stimulants if the drug was NOT prescribed to you or you took the drug only for the experience or feeling it caused. We are not interested in your use of "over-the-counter" stimulants such as Dexatrim or No-Doz that can be bought in drug stores or grocery stores without a doctor's prescription.

C1. Overall, would you say that instructions for *Section C: Prescription Stimulants* are:

	Yes	**No**
a. Focused	☐	☐
b. Brief	☐	☐
c. Clear	☐	☐
d. Readable	☐	☐
e. Assuring	☐	☐

C2. If you checked "No" to any of the above criteria, please write your comments and suggestions for revision below.

C3. Do you believe the slang (e.g., Uppers, Speed, Pep pills) and trade names (e.g., Ritalin, Concerta, Aderall, etc.) used in this section reasonably represent the universe of names used to describe prescription stimulants?

- ☐ Yes
- ☐ No
- ☐ Don't Know

C4. If you checked "No" to the above question, please indicate how you would revise the slang and/or trade names below.

C5. Are there any other components of the instructions for *Section C: Prescription Stimulants*, that should be omitted, modified, or added? If so, please comment below.

Please click the *Next* button below to continue with the assessment.

Next

Expert Panel Review

Note to Reviewers: Please use this page to comment on items and response options for *Section C: Prescription Stimulants.*

9. During your life, how many times have you used a prescription stimulant that was not prescribed to you or you took only for the feeling it caused?
A. 0 times
B. 1 or 2 times
C. 3 to 9 times
D. 10 to 19 times
E. 20 to 39 times
F. 40 to 99 times
G. 100 or more times

10. How old were you when you first tried a prescription stimulant that was not prescribed to you or you took only for the feeling it caused?
A. I have never used a prescription stimulant in a way not prescribed for me by a doctor
B. 8 years old or younger
C. 9 or 10 years old
D. 11 or 12 years old
E. 13 or 14 years old
F. 15 or 16 years old
G. 17 years old or older

11. During the past 30 days, how many times did you use a prescription stimulant that was not prescribed to you or you took only for the feeling it caused?
A. 0 times
B. 1 or 2 times
C. 3 to 9 times
D. 10 to 19 times
E. 20 to 39 times
F. 40 or more times

12. During the past 30 days, how many times did you use a prescription stimulant that was not prescribed to you or you took only for the feeling it caused on school property?
A. 0 times
B. 1 or 2 times
C. 3 to 9 times
D. 10 to 19 times
E. 20 to 39 times
F. 40 or more times

C6. Overall, would you say the questions (9-12) in this section are:

	Yes	No
a. Focused	☐	☐
b. Brief	☐	☐
c. Clear	☐	☐
d. Readable	☐	☐

C7. If you checked "No" to any of the above criteria, please write your comments and suggestions for revisions below.

C8. Overall, would you say the response options (for questions 9-12) in this section are:

	Yes	No
a. Clear	☐	☐
b. Adequate	☐	☐

C9. If you checked "No" to either of the above criteria, please write your comments and suggestions for revision below.

C10. Please use the space below if you have any additional comments related to *Section C: Prescription Stimulants.*

Please click the *Next* button below to continue with the assessment.

Next

Expert Panel Review

Please use the space below to provide any additional comments.

Instrument Assesment Completed by:

Name:

Title:

Institution:

Submit Survey

APPENDIX G
EXPERT PANEL COMMENTS FOR REVISIONS

Comments Regarding Instructions

Even though your wording "you took the drug only for the experience or feeling it" corresponds to SAMHSA's I believe that this can be confusing and suggest that you consider the additional explanation (perhaps parenthetically) that is often offered to lay and professional persons alike, e.g., (did you use it to alter your mood such as to get "high"?)

Way too long - I would have skipped it and just answered the questions. Have you checked the reading level - for high school kids it should be about 7th grade. I would delete the entire 2nd sentence since it is not neutral - and may create socially desirable responses.

In terms of readability, everything is 'scrunched up'

I have always had concern about the operating definition of non-medical use employed by SAMHSA on the NHSDUH because, while the intent is really to get at "nontherapeutic use", the test is imprecise. As an example, this wording, if followed properly, would capture a person who took an analgesic offered to them by a parent for an appropriate reason, that is, the "experience or feeling it caused" was analgesia. Do you really want to capture that use? You have an opportunity to sort this out, yet still use the SAMHSA definition, a real contribution to the literature -- after this item, ask them to either write in or choose from a list all the experiences or feelings they sought from the NMU of the drug. This would provide very useful data.

The reading level is high. Flesch-Kincaid and SMOG it.

Aspirin should be mentioned as an over-the-counter drug.

You appear to be using the same definition of non-medical use as that used in the NSDUH; is this for comparison across surveys? Please note that this definition has its critics....

I am not sure I like the term 'depressants'; it seems somewhat nondescriptive for these classes of drugs and is not widely used. Perhaps tranquilizers and sedatives.

I am wondering if it is possible for a drug to be prescribed, but taken only for the feeling. For example, could someone not get a fraudulent prescription (i.e., faking symptoms) just

to get the meds. Or, could someone have been prescribed the meds legitimately at some point for something that they didn't really need it for (I know that I was prescribed way more pain killers than necessary when I had a root canal). Just a thought, because this may (or may not) be an important distinction.

Lose the big introductions - just ask the questions - maybe with a few examples of what each type of drug is. It is way too wordy, complicated, and directive now.

Comments Regarding Slang and Trade Names

You may want to consider adding some generic names to the brand names (eg, oxycodone, hydrocodone).

I would consider listing the drug names and possibly the slang names as well.

The slang terms may not be remotely familiar to even people who are users/abusers.

Also, I would use the trade names first, then the slang names.

In the slang list, start with "Painkillers". Also missing from this list is fentanyl, in both transdermal and buccal lozenge formulations. Street names are "morphine patches" (even though they contain fentanyl) and "Perc-a-pops" (even though they contain fentanyl). Also, street name for codeine is "C" or "Lean and dean" (Rx cough syrup); for hydrocodone cough syrup is "Tuss" and "syrup"; for hydromorphone "D's"; for morphine "Miss Emma"; for pentazocine "T's".

I just don't think everyone else will know them by these names.

There are endless slang names that are used and they change with such frequency that one could never keep up with all of them. The trade names are okay as written.

I believe that the use of the words Oxies, Percs, Hillbilly heroin, or Demmies are pejorative and suggest that it is socially unacceptable to use these drugs. In this context, I am afraid that it might stifle honest responses.

I would not use these slang terms for the same reason stated above: Nerve pills, Downs, Downers, Sleepers, Barbs, Benzos, or Stumblers

These are pejorative names: Uppers, Speed, or Pep Pills

... you might want to include some of the new ones [depressants]- Lunesta, for example, which is being promoted DTC on TV.

The trade name Meberal is only found in museums these days.

I would present trade names first.

These drugs [stimulants] have other uses as well, including treatment of depression (generally refractory depression). See prior comments from other classes.

General audience will not know these names universally.

I would suggest getting rid of methedrine because it is too confusing with Crystal Meth that is not a prescription drug. Besides, methedrine is rarely encountered today as a prescription drug.

Comments Regarding Items

"... on school property" in Question 4 should be bold-faced to let readers easily distinguish the differences between Questions 3 & 4.

Underline "on school property" so it stands out in Q4.

You may wish to emphasize "on school property" by using italics or bolding to set it apart from the previous question

I think the statement should read: "...pain reliever that was NOT prescribed to you or that you took only for the feeling it caused" with the NOT in all caps and bold. I would also bold the important words in each item that differentiate it from the others, given the way most young folks read today, so in item 1(during your life), item 2 (how old were you), item 3 (during the past 30 days), item 4 (during the past 30 days AND on school property).

Items' use of "or" may confuse some people or cause them to stumble on the question or or skip it. Moreover, I think it is important to know whether people took something for its supposed therapeutic effect vs. its "high.""

Comments Regarding Response Options

"When you can avoid categorical responses, do so. Strive for highest level of measurement possible.

I would use the same frequency of use for lifetime, past year, and past-month.

I would include option G on item 3 -- you might get some takers, believe it or not. I would also include option G on item 4 as a test of credibility of the questionnaire, as someone who endorses abusing more than 100 times on school property is probably not being honest.

Keep frequency of use consistent across lifetime, past-year and past-month. Also, it just now occurs to me that you will not be getting at daily use in past year if you limit to your current options.

Other Comments

I think it would be a great contribution to the field if you could ask questions on where these folks obtained the drugs that they are using non-medically

Thanks for asking me to do this - it was fun

APPENDIX H
APPLICATION TO THE UNIVERSITY OF FLORIDA INSTITUTIONAL REVIEW BOARD

UNIVERSITY OF FLORIDA INSTITUTIONAL REVIEW BOARD

1. TITLE OF PROTOCOL:

   Secondary Analysis of a Modified Youth Risk Behavior Survey

2. PRINCIPAL INVESTIGATOR:

   Melissa C. Morris, M.P.H.
   Ph.D. Candidate
   Department of Health Education and Behavior
   FLG-69
   PO Box 118210
   Gainesville, FL 32611-8210
   Tel: (352) 392-0583, ext. 1254
   Fax: (352) 392-3186
   Eml: mcmorris@hhp.ufl.edu

3. SUPERVISOR (If PI is student):

   Robert M. Weiler, Ph.D., M.P.H.
   Associate Professor
   Department of Health Education and Behavior
   FLG-5
   PO Box 118210
   Gainesville, FL 32611-8210
   Tel: (352) 392-0583, ext. 1282
   Fax: (352) 392-3186
   Eml: rweiler@hhp.ufl.edu

4. **DATES OF PROPOSED PROTOCOL:**
   From February 21, 2006 To February 20, 2007

5. **SOURCE OF FUNDING FOR THE PROTOCOL:**
   None

6. SCIENTIFIC PURPOSE OF THE INVESTIGATION:

   According to the U.S. Department of Health and Human Services, 75 percent of adolescent mortality is due to preventable causes including motor vehicle crashes, homicide, and suicide. Modifiable behaviors particularly relevant to adolescents involve unintentional injuries, violence, substance use, mental health, reproductive health, physical activity levels, and dietary habits. Schools and communities can benefit when priority health risk behaviors that contribute to the leading causes of death, disability and social problems are periodically monitored through survey research. Research conducted to determine the prevalence of health risk behaviors and assess whether health risk behaviors increase, decrease or stay the same over

time, can be used to inform school-based curricula and health education programs so they may be better tailored for student populations.

One survey used to monitor health behavior trends among American adolescents is the Youth Risk Behavior Survey (YRBS), conducted by the federal Centers for Disease Control and Prevention (CDC). The CDC administers this survey on national and state representative samples of 9th through 12th grade students administered every two years. However, local agencies frequently choose to modify and administer the survey to obtain needs assessment data for their communities.

For this research, I have been commissioned by the School District of Santa Rosa County, Florida to assist in the modification of the YRBS to include items that monitor an emerging trend in youth risk behavior— prescription drug abuse. Currently, the YRBS contains no items that measure drug abuse although a large body of evidence suggests prescription drug abuse is increasing in magnitude in the U.S., particularly among young people.

I have additionally been asked to analyze data obtained from the school-based survey in order to prepare a district and school profile. This profile will help determine where health priorities for the school district lie and will serve as a needs assessment. Thus, survey results may ultimately be used to create school health programs to help reduce these risk behaviors and promote health enhancing behaviors.

The purpose of this study, therefore, is twofold: (1) to first assist Santa Rosa County in modifying the YRBS to monitor an emergent trend relevant to adolescent health—prescription drug abuse; and (2) to provide a comprehensive assessment of priority adolescent health behaviors to the Santa Rosa community.

7. DESCRIBE THE RESEARCH METHODOLOGY IN *NON-TECHNICAL* LANGUAGE:

This research will consist of a secondary analysis of data collected by Santa Rosa County District Schools during the fourth grading period, 2006. This study will take place in two stages and will include: (1) analysis of the pilot test data and (2) analysis of the final instrument administration data.

Stage 1: Pilot test data analysis. The pilot test data analysis portion of this study will serve to assess test-retest reliability of newly constructed prescription-drug related items integrated into the YRBS. Test-retest reliability is concerned with the extent to which responses on survey items are similar when administered at two points in time. Anonymous student data collected on two occasions at Pace High School will be analyzed using the Statistical Analysis System (SAS), version 9.1. The kappa coefficient, or "Cohen's K," will be calculated as an estimate of test-retest reliability. If necessary, modification of the instrument will be made based on findings from the data analysis.

Stage 2: Final questionnaire data analysis. After a final draft of the modified YRBS is administered to students at Gulf Breeze High School, anonymous student data from electronic answer sheets will be scanned by an optical scanner, transferred to a data file, and then analyzed using the Statistical Analysis System (SAS), version 9.1. Descriptive statistics will first be generated to develop a demographic profile of the sample. Inferential statistics (e.g., chi-square and logistic regression analyses)

will then be used to examine the relationship (if any) among non-medical prescription drug use and other adolescent health risk behaviors. A report based on study findings will be generated and disseminated to stakeholders including participating schools' principals, district level school health advisors, and law enforcement officials.

8. POTENTIAL BENEFITS AND ANTICIPATED RISK:

Potential benefits include the development of new items that monitor prescription drug abuse and a contribution to the sparse body of knowledge on the nature of prescription drug abuse among adolescents. In addition, the high-schools participating in the survey research will each receive a final report of study results which can then be compared to local, state, and national data.

Anticipated risks are minimal, as access to the secondary data source will in no way allow for identification of any student who has participates in the survey. Students who complete the survey are instructed not to place any identifying information on the survey itself. Because the survey is anonymous, there will be no way to trace survey responses back to participants.

9. DESCRIBE HOW PARTICIPANT(S) WILL BE RECRUITED, THE NUMBER AND AGE OF THE PARTICIPANTS, AND PROPOSED COMPENSATION (If any):

The first portion of this study will involve secondary analysis of surveys completed by approximately 200 students in the 9th through 12th grades (ages 15 to 18) at Pace High School, a large public high-school in Santa Rosa County, Florida. The second portion of this study will involve secondary analysis of surveys completed by approximately 1560 students in the 9th through 12th grades at Gulf Breeze High School, another large public high-school in Santa Rosa County. No compensation has been allotted for this study.

10. DESCRIBE THE INFORMED CONSENT PROCESS. INCLUDE A COPY OF THE INFORMED CONSENT DOCUMENT (If applicable):

Because the present study involves a secondary analysis of existing data, an informed consent document is not applicable.

_____ _____
Principal Investigator's Signature Date
Melissa C. Morris, M.P.H.

_____ _____
Supervisor's Signature Date
Robert M. Weiler, M.P.H., Ph.D.

I approve this protocol for submission to the UFIRB:

_____ _____
Dept. Chair's Signature Date
Robert M. Weiler, M.P.H., Ph.D.

APPENDIX I
SANTA ROSA COUNTY SCHOOL BOARD LETTER OF INITIATION

SANTA ROSA COUNTY DISTRICT SCHOOLS

Regular Meeting
Second and Fourth
Thursday of Each Month
At 6:30 P.M.

SANTA ROSA COUNTY SCHOOL BOARD
603 Canal Street
Milton, Florida 32570-6706

JOHN W. ROGERS
SUPERINTENDENT OF SCHOOLS
(850) 983-5000
FAX (850) 983-5011
Suncom 689-5000
Website: http://www.santarosa.k12.fl.us

Melissa C. Morris, M.P.H.
Department of Health Education & Behavior
University of Florida
P.O. Box 118210
Gainesville, Florida 321611-8210

February 10, 2006

Dear Ms. Morris,

The Department of Safe and Drug Free Schools, Santa Rosa County will be conducting a survey of adolescent health risk behaviors among our students. The survey is anonymous and has been commissioned by the Santa Rosa County School District. In the past, we have conducted similar needs assessments to keep our curriculum and program activities relevant to the needs of our students.

Given your expertise in data analysis, we would like to request your assistance in helping us modify selected survey items and analyze our data. It is understood that your access to this secondary data source will in no way allow you to identify any student who participates in the survey. Furthermore, it is understood that Santa Rosa County School District owns this data and takes full responsibility for the type of data and how it was collected from our students. In exchange for your unpaid assistance in analyzing our data, it is understood that you will not use the name of our schools, or any information which would somehow identify our schools in any publication or presentation.

I hope you will be able to assist us with this project. Please contact us if you have any questions concerning our request. We look forward to working with you.

Sincerely,

Rod Gracey

Mr. Rod Gracey
Director of Student Services
Santa Rosa District Schools
850-983-5052

Sharon Myers-Mongue

Sharon Myers-Mongue
Safe & Drug Free Schools, TSA
Santa Rosa District Schools
850-983-5581

APPENDIX J
UNIVERSITY OF FLORIDA INTIUTIONAL REVIEW BOARD PROJECT EXEMPTION NOTICE

UNIVERSITY OF FLORIDA

Institutional Review Board

98A Psychology Bldg.
PO Box 112250
Gainesville, FL 32611-2250
Phone: (352) 392-0433
Fax: (352) 392-9234
E-mail: irb2@ufl.edu
http://irb.ufl.edu

March 6, 2006

TO: Melissa C. Morris
PO Box 118210
Campus

FROM: Ira S. Fischler, PhD, Chair
University of Florida Institutional Review Board 02

SUBJECT: UFIRB Protocol #2006-U-0164
Secondary Analysis of a Modified Youth Risk Behavior Survey

FUNDING: None

Because only existing data will be used in this protocol, it is exempt from further review by the Board in accordance with 45 CFR 46.101b(4), as no human participants are involved in this research. It is understood that information will be recorded by the investigator in such a manner that individuals cannot be identified, directly or through identifying links.

Should the nature of your study change or you need to revise this protocol in any manner, please contact this office before implementing the changes.

IF/dl

APPENDIX K
PARENTAL CONSENT FORM

April 17, 2006

Dear Parent/Guardian,

Next month, your child's class will take part in a survey research study. The research survey will ask about the health behaviors of 9th through 12th grade students. These include behaviors that result in injuries; tobacco, alcohol, and drug use; sexual behaviors; dietary behaviors; and physical activity. The results of the study will allow researchers to better understand the health behaviors of students and may help your child by improving health and safety programs at their school.

During the week of May 1-4, Students will be asked to fill out an in-class questionnaire that takes about 50 minutes to complete. Completing this anonymous survey will cause little or no risk to your child. The only potential risk is that some students might find certain questions to be sensitive. The survey has been designed to protect your child's privacy. Students will not put their names on the survey. Also, no class or student will ever be mentioned by name in a report of the results.

With your permission, we would like to ask your child to participate in this research study. We would like all selected students to take part in the survey, but **the survey is voluntary**. No action will be taken against you or your child, if your child does not take part. Students can skip any question that they do not wish to answer and they may stop participating in the survey at any point without penalty. An alternate activity will be assigned for students who do not wish to participate.

Please read the section below. If you do **not** want your child to take part in the survey, check the box and return the form to the school no later than April 20th. If you grant permission for your child to participate, you do not have to take any further action. Should you have any questions about this research study, please contact Sharon Myers, Director of Santa Rosa Safe and Drug Free Schools at 983-5581.

Child's name: _____

I have read this form and understand what the survey is about.

☐ My child may **NOT** take part in this survey.

Parent's signature: _____ Date: _____

Phone number: _____

APPENDIX L
TEACHER PROTOCOL FOR SURVEY ADMINISTRATION

Pace High School Health Behavior Survey
Pre-Survey: March 21-23
Post-Survey: April 3-7

Introduction:

- These instructions detail the procedure to be followed for the administration of the Pace High School Youth Risk Behavior Survey.
- Please do not deviate from the procedures outlined.

Participation:

- Please do not, under any circumstances, give a student a survey whose parents or guardian refused their participation, or to a student who chooses not to participate at the time of the survey.

Procedures:

Week of March 21-23

IMPORTANT: PROCEED WITH THE INSTRUCTIONS AS QUICKLY AS POSSIBLE. SOME STUDENTS WILL NEED THE ENTIRE PERIOD TO COMPLETE THE SURVEY.

1. Pass out manila envelopes to all participating students and ask students to put away all other materials.

2. Briefly introduce the study by saying the following:

   "Over next couple of weeks, our school is conducting a student survey. I would like to emphasize that this is not a test. This survey is about health behavior. It has been developed so you can tell us what you do that may affect your health."

3. After the introduction say:

   "I have passed out an envelope to each of you. Please open the envelope and check that it contains a survey booklet labeled 'A', a survey booklet labeled 'B', and two (2) Scantron sheets. Please put the survey booklet labeled 'B' and one of the Scantron sheets back into the envelope. Seal the envelope and print your name on the back across the tab. Please pass the envelope you have just signed up the front of the class. You will complete survey 'B' in approximately two weeks."

4. Collect envelopes a place in the box provided. Set aside for distribution during the week of April 3-7. Students should now only be left with a survey booklet labeled "A" and a Scantron sheet.

5. Ask students to look at page one and follow along as you READ VERBATIM the "General Instructions."

The Pace High School
Youth Risk Behavior Survey
General Instructions

This survey is about health behavior. It has been developed so you can tell us what you do that may affect your health. The information you give will be used to develop better health education for young people like yourself.

DO NOT write your name on this survey or the answer sheet provided. The answers you give will be kept private. No one will know what you write. Answer the questions based on what you really do.

Completing this survey is voluntary. Whether or not you answer the questions will not affect your grade in this class. There are no right or wrong answers. If you are not comfortable answering a question, just leave it blank.

The questions that ask about your background will be used only to describe the types of students completing the survey. The information will not be used to find out your name. No names will ever be reported.

If you have any questions concerning the survey, please contact Mrs. Sharon Myers-Mongue in the Santa Rosa District Schools Office at 983-5581.

Make sure you read every question. Fill in the ovals on the answer sheet completely. When you are finished, follow the instructions of the person giving you the survey.

6. Then say:

   "Again, let me say that your participation is voluntary. If you choose not to participate, please return your survey to me and sit quietly at your desk."

   "Remember, do not write your name anywhere on the survey."

   "If you do not understand a question on the survey, raise your hand and I will assist you.* If you are unsure about how you wish to respond, continue on and then come back to that question after you have completed the rest of the survey."

   "Read the instructions for each section of the survey carefully, starting with Section A: Demographics."

"When you are finished, put the Scantron sheet inside your booklet and sit quietly at your desk until everyone has finished."

7. Conclude by saying:

   "You may begin."

8. Announce to the class when there are ten minutes left in the administration period. At the end of the class period, collect all of surveys. Be sure that all are accounted for, including those who didn't participate.

9. Complete the form titled "**CLASS DATA FORM**, **Pace High School Health Behavior Survey, Pre-Survey: March 21-23."**

10. Place the survey booklets and answer sheets in the large envelope provided and seal in full view of the students. Make sure that the completed Class Data Form is attached.

11. A representative will come to your classroom to collect the completed survey packet on March 23 at the end of the day.

*Monitoring and Answering Questions:

- While the students complete the survey, stay in front of the classroom (except to answer questions).
- You may answer questions about the general nature of the survey. However, do not encourage questions and answers in front of the whole class.
- Students with questions should raise their hands
- When you go to the student's desk to answer a question, avoid looking at anyone's survey, this may arouse suspicion among some students.
- Do not look at a completed survey.

REMEMBER:

- No one at the school may examine a completed survey.
- Do not review the surveys in the sight of students.
- Do not walk around the room during the survey.
- If a student refuses to fill out a survey, collect their survey and ask then to sit quietly at their desk. DO NOT allow them to review a survey.
- Note the number of students who refused to participate on the Class Data Form.
- Complete the Class Data Form.
- Only pass out one survey packet per student.
- Your class packet will be picked up on the day indicated in the "Procedures" section

Week of April 3-7

1. Pass out manila envelopes to the corresponding students who participated in the survey two weeks prior. If a student was absent on the day of the original survey, ask them to read quietly at their desk.

2. Re-introduce the study by saying the following:

   "I have passed back the envelopes you signed two weeks ago. Please break the seal and remove the envelope's contents. You should have a survey booklet labeled 'B' and a Scantron sheet. Now fold the envelope in half. I will pass around a waste basket so you can discard only the envelopes. Make sure you keep your survey booklet and Scantron."

3. Pass around a waste paper basket so students may throw away the envelopes. Also discard any packets belonging to students who are absent or who choose not to participate on the re-test day.

4. Ask students to look at page one and follow along as you READ VERBATIM the "General Instructions."

The Pace High School
Youth Risk Behavior Survey
General Instructions

This survey is about health behavior. It has been developed so you can tell us what you do that may affect your health. The information you give will be used to develop better health education for young people like yourself.

DO NOT write your name on this survey or the answer sheet provided. The answers you give will be kept private. No one will know what you write. Answer the questions based on what you really do.

Completing this survey is voluntary. Whether or not you answer the questions will not affect your grade in this class. There are no right or wrong answers. If you are not comfortable answering a question, just leave it blank.

The questions that ask about your background will be used only to describe the types of students completing the survey. The information will not be used to find out your name. No names will ever be reported.

If you have any questions concerning the survey, please contact Mrs. Sharon Myers-Mongue in the Santa Rosa District Schools Office at 983-5581.

Make sure you read every question. Fill in the ovals on the answer sheet completely. When you are finished, follow the instructions of the person giving you the survey.

5. Then say:

   "Again, let me say that your participation is voluntary. If you choose not to participate, please return your survey to me and sit quietly at your desk."

   "Remember, do not write your name anywhere on the survey."

   "If you do not understand a question on the survey, raise your hand and I will assist you. If you are unsure about how you wish to respond, continue on and then come back to that question after you have completed the rest of the survey."

   "Read the instructions for each section of the survey carefully, starting with Section A: Demographics."

   "When you are finished, put the Scantron sheet inside your booklet and sit quietly at your desk until everyone has finished."

6. Conclude by saying:

   "You may begin"

7. Announce to the class when there are ten minutes left in the administration period. At the end of the class period, collect all of surveys. Be sure that all are accounted for, including those who didn't participate.

8. Complete the form titled "**CLASS DATA FORM, Pace High School Health Behavior Survey, Pre-Survey: April 3-7"**

9. Place the survey booklets and answer sheets in the large envelope provided and seal in full view of the students. Make sure that the completed Class Data Form is included.

10. A representative will come to your classroom to collect the completed survey packet on April 7 at the end of the day.

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BIOGRAPHICAL SKETCH

Melissa Christina Morris was born on December 23, 1979 in Miami, Florida. She grew up in Miami and graduated from Coral Gables Senior High School in 1998. As an undergraduate at Wellesley College (Massachusetts), Melissa double-majored in Neuroscience and Spanish. She also studied abroad for a semester in Madrid, Spain at the Universidad Complutense de Madrid during her undergraduate tenure. Melissa graduated with honors from Wellesley in 2002.

Shortly after college graduation, Melissa began her graduate studies at the University of Florida. She received her master's degree in public health with a specialization in community health education in the summer of 2003. In the fall of 2003, Melissa was accepted into the doctoral program in the Department of Health Education & Behavior to pursue a Ph.D. in health behavior. She was the recipient of an Alumni Gradate Fellowship Award, the highest award offered by the University of Florida to incoming graduate students. Throughout her graduate studies, Melissa maintained an active academic agenda. She was involved in several research projects that culminated in published abstracts, presentations at national meetings, and manuscripts. She is active in several professional organizations and is a Certified Health Education Specialist. In 2004, Melissa was awarded the Outstanding Graduate Student Award by the Department of Health Education & Behavior. She was also the recipient of the 2006 Delbert Oberteuffer Scholarship presented by the American Association for Health Education.

Melissa joined the faculty of the Department of Health, Leisure, and Exercise Science at the University of West Florida (UWF) during the fall of 2006. Upon graduation she will continue to teach courses in health education at UWF.