

EXPLORING LINEAR AND CIRCULAR RELATIONSHIPS BETWEEN ACADEMIC
PERFORMANCE AND RISKY SEXUAL BEHAVIORS OF COLLEGE STUDENTS

BY

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DISSERTATION

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ABSTRACT

Sexual health is a continuous concern of college and university administrators across the country. The purpose of this study was to explore the linear and circular relationship between academic performance, risky sexual behaviors and sexually transmitted diseases. While these relationships have been vastly studied in high school students, there is limited information on how these relationships play out in college students.

The National College Health Assessment-II was analyzed to identify the correlations between academic performance, risky sexual behaviors and sexually transmitted diseases. I analyzed the relationship between approximate grade point average and number of sexual partners, approximate grade point average and condom use and approximate grade point average and anal intercourse. I also examined the relationships between sexually transmitted disease status and approximate grade point average. Lastly I looked at how all three (academic performance, risky sexual behaviors, and sexually transmitted disease status) relate to each other.

The results showed that generally, students with higher grade point averages engaged in risky sexual behaviors less frequently than those with lower grade point averages. Students with higher grade point averages reported fewer sexual partners, engaged in anal intercourse less frequently and reported higher rates of condom use during vaginal intercourse. Sexually transmitted disease diagnosis/treatment was also correlated with approximate grade point average in relation to gonorrhea, chlamydia and HIV. Students with lower grade point averages reported higher frequency of STD diagnosis/treatment within the last 12 months. Finally our results showed that students with higher grade point averages were less likely to be diagnosed/treated for a sexually transmitted diseases. The odds of students engaging in anal

intercourse were increased as grade point averages decrease; however, the odds of students using condoms during vaginal intercourse decreased as grade point averages increase.

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CHAPTER 1

INTRODUCTION

1.1 STATEMENT OF PROBLEM

During their college years, young adults are at a time in their lives when they are searching, discovering, and experimenting and in many cases this includes sexual experimentation. A single act of risky sexual intercourse has the potential to cause adverse effects both long term and short term for college students. For instance, sexually transmitted diseases can be an outcome of risky sexual behavior.

The Centers for Disease Control and Prevention (CDC) estimates that there are a total of 19 million new sexually transmitted disease (STD) cases each year. Adolescents between the ages of 10 to 19 and young adults ages 20 to 24 years are at a higher risk of contracting a STD than their older adult counterparts (CDC, 2009). While young people aged 15-24 only represent 25% of the sexually experienced population, they make up nearly half of all new STD cases (CDC, 2009; Weinstock, Berman, & Cates, 2004). For example, the peak incidence of chlamydia and gonorrhea occurs among 20 to 24 year olds (Centers for Disease Control and Prevention, 2013b). One reason why older adolescents and young are at a higher risk for adverse health effects is that this population is more likely to be sexually active than their younger and older counterparts. These adverse health effects can be seen on an individual and societal level. When left untreated, sexually transmitted diseases such as, chlamydia, gonorrhea, human papillomavirus, and syphilis can result in pelvic inflammatory disease, infertility and cervical cancer (Cates, 1991). Another problem being seen in relation to sexually transmitted disease treatment is antibiotic resistance. As health care providers continue to prescribe antibiotic

treatments for sexually transmitted diseases, resistance is building and it is becoming more difficult to cure bacterial STDs such as gonorrhea (CDC, 2013a).

Because of the significant role played by risky sexual behaviors in the transmission of venereal diseases, attention needs to be directed towards addressing the possible predictors and factors related to risky sexual behaviors. It is important to study these behaviors in college students because within the last decade, college students have engaged in more drug use and risky sexual activities than in the past (Pluhar, Frongillo, Stycos, & Dempster-McClain, 2003). Risky sexual behaviors such as anonymous sex and anal intercourse can lead to high rates of morbidity and mortality among college students (Wilson & Jorffe, 1995; Lewis, Malow, & Ireland, 1997; Siegel, Klein & Roghmann, 1999).

1.2 BACKGROUND AND SIGNIFICANCE

Research has shown that stressful life events (e.g. job lost, absence of a parent, academic probation/failed class) may put people at higher risk for unhealthy behaviors (e.g. tobacco/alcohol use, drug use, unsafe sexual activity) (Eliason & Storrie, 2009; Ellis, et al., 2003; Emmons, Wechsler, Dowdall, & Abraham, 1998). While many of the relationships between various factors and academic performance have been vastly studied, one relationship that has not been explored is the influence of academic performance on risky sexual behavior in college students who are generally between the ages of 17 and 22. At this crucial point in college student lives, behaviors learned during adolescence may still be pliable into lifelong patterns (Emmons et al., 1998).

According to studies based on the adolescent population, improving academic performance is important in reducing long term sexual risks (Taylor-Seehafer & Rew, 2000). It is

reported that poor academic performance, negative attitudes towards school, and low educational aspirations are predictors of early initiation of intimate sexual activity (Coker et al., 1994; Resnick et al., 1997). Poor academic performance is an important factor in the occurrence of health compromising behaviors such as alcohol use and unprotected sexual intercourse. Brenner and Collins (1998) determined that students who are not attending school have an increased prevalence of multiple health-risk behaviors.

Although poor academic performance in relation to sexual behaviors has been studied in adolescents, it has been overlooked in the young adult college student population. There are studies of adolescents conducted on poor academic performance in relation to substance abuse, sleep deprivation, risky sexual behaviors, and other unsafe health-related behaviors (Emmons et al., 1998; Miller, Danner, & Staten, 2008; Trockel, Barnes, & Egget, 2000). There are also prospective studies that show an increased risk of sexual behaviors in young adults with poor academic performance during high school and post-high school (Bailey, Fleming, Henson, Catalano, & Haggerty, 2008; Bogart, Collins, Ellickson, & Klein, 2006). According to Hittner and Kryzanowski (2010), few, if any, published studies have examined the relationship between academic performance and risky sexual behavior in college students. This population of young adults is important because they are in a developmental period that is characterized by exploration and newfound independence (Arnett, 2000). Additional research is needed to better understand the relationship between academic performance and high risk sexual behaviors among the college student population.

1.3 THEORETICAL FRAMEWORK

In the investigation of this topic, The Problem Behavior Theory (Jessor & Jessor, 1977) will be used as a theoretical framework. Although typically used to describe adolescent behavior, this theory is also applicable to young adults specifically those in their early college years (Donovan & Jessor, 1985; Jessor, 1987). The Problem Behavior Theory postulates that risky behavior is a violation of a social norm.

Studies have shown that problem behaviors are correlated (Barrera, Biglan, Ary, & Li, 2001). In particular, sexual risk behaviors have been linked to other problem behaviors in adolescents such as substance abuse and lower grades in school (Luster & Small, 1994). It is also important to note that a reverse relationship also occurs with sexual risk behaviors and school performance. Poor academic achievement and school performance have been linked to substance use, delinquent behavior and risky sexual behavior (Bingham & Crockett, 1996; Luster & Small, 1994). It has been demonstrated that adolescents who engage in risky sexual behaviors have lower educational aspirations and grades (Ary, Duncan, Duncan, & Hops, 1999; Halpern, Joyner, Udry, & Suchindran, 2000).

The Problem Behavior Theory is driven by a social-psychological perspective. According to Jessor, it focuses on three systems: personality, perceived environment and behavior. The first system is the personality system. Within this system there are three main psychological structures: motivational instigation, personal belief, and personal control. The motivational instigation structure is based on values and expectations of attaining goals that provide directionality to action and determines whether or not the behavior will take place. The second structure in the personality system is personal belief. The role of this structure is to work to constrain the motivational instigators. The third and final structure of the personality system is

personal control. This structure is directly linked to the behaviors involved. It is the control structure (similar to personality structure) that controls against normative behavior.

The second system in the Problem Behavior Theory is perceived environment. The perceived environment refers to the socio-psychological environment rather than the physical. Perceived environment consists of two structures, distal and proximal. The distal structure characterizes the social context that one is located, that is, parent and family oriented versus friend or peer oriented. The second structure in the perceived environment system is the proximal structure. This is the degree to which an individual is located in the social context where the problem behavior is prevalent. The environmental prevalence of models carries a few important implications. It provides the opportunity to learn how to engage in a behavior. There is also the accessibility of needed items to carry out the behavior, for example contraceptives are needed to carry out the behavior of safer sexual activities. Other implications are the idea that the behavior can be accomplished and that it is not inconceivable and that the social controls against the behaviors are not effective or universally implemented.

The third and final system of the Problem Behavior Theory is the behavior system. The first structure of the behavior system is the problem behavior structure. The seven variables in this structure are focused around actions that are considered by larger society to be inappropriate, undesirable, departing from commonly shared social norms and warrant the exercise of social controls. The second part of the behavior system is the conventional structure. These two variables are concerned with behavior that is socially approved and normally expected. Church or formalized religious activities and academic performance work as constraints or alternatives to engaging in problem behavior. When time and effort are invested in church or school, those

activities would interfere with time and opportunity to engage in problem behavior (i.e. risky sexual behaviors).

The Problem Behavior Theory is a combination of variables that drive the directionality of the behavior and controls that work to constrain against the behavior. One constraint that is the most applicable to this study is found in the conventional structure of the behavior system. Based on the theory academic performance should work as a constraint or alternative to engaging in problem behavior.

The occurrence of the behavior is considered an outcome of an interaction between personality and environmental influences. These systems interrelate and are organized in a manner where they play upon each other and implicate whether the likelihood of the occurrence of the problem behavior is greater or lesser.

It is also important to note that while the “hooking up” culture is more prevalent on college campuses than not, the normative behaviors regarding sexual activity among college students are often overestimated. It has been demonstrated that college students do not engage in sexual intercourse as often as perceived and they also do not have as many perceived sexual partners (Martens et al, 2006; Page, Hammermeister & Scanlan, 2000). Thus students engaging in these riskier behaviors are violating the social norms around sexual activity among college students. The hope is that when applying this theory I can better understand the effects on risky sexual behavior that occur when high value is placed on academic performance in a college setting.

1.4 PURPOSE

This study will involve the exploration of three relationships. The first is to examine the relationship between academic performance (grade point average) and risky sexual behaviors (e.g. multiple sexual partners, condom use and anal intercourse). Secondly, the study will seek to gain better insight on the relationship between sexually transmitted disease diagnosis/treatment and academic performance among college students within the United States. In addition, more knowledge will be sought on the relationship between academic performance, risky sexual behaviors and sexually transmitted diseases.

Examining the relationship between sexually transmitted disease diagnosis/treatment and academic performance is a logical extension when looking at the first relationship between academic performance and risky sexual behaviors. Although similar, the relationships examine two different health issues. The second relationship, academic performance and sexually transmitted disease diagnosis/treatment, explores an outcome (sexually transmitted diseases) of the first relationship. This offers an interesting perspective on the relationship between academic performance and risky sexual behavior. Lastly, I will look at how all three variables: academic performance, risky sexual behaviors and sexually transmitted disease diagnosis/treatment interact with each other.

These three variables: academic performance, risky sexual behaviors, and sexually transmitted diseases form a circle in which altering one (whether negatively or positively) will have an effect on the others. It is imperative to examine the logical cycle of the three variables to fully understand their relationship. The following research questions were developed to address the relationship (positive or negative) that academic performance has on risky sexual behavior and how sexually transmitted disease status may or may not affect academic performance.

1.5 RESEARCH QUESTIONS

- I. What is the relationship between academic performance and risky sexual behavior among students within a university setting?
 - a. What is the relationship between academic performance and number of sexual partners?
 - b. What is the relationship between academic performance and engaging in anal intercourse?
 - c. What is the relationship between academic performance and condom use?
- II. What is the relationship between sexually transmitted diseases (STDs) diagnosis/treatment and academic performance?
 - a. What is the relationship between being diagnosed/treated for gonorrhea and academic performance?
 - b. What is the relationship between being diagnosed/treated for chlamydia and academic performance?
 - c. What is the relationship between being diagnosed/treated for herpes and academic performance?
 - d. What is the relationship between being diagnosed/treated for the human papillomavirus/warts (HPV) and academic performance?
 - e. What is the relationship between being diagnosed/treated for HIV/AIDS and academic performance?
- III. What is the relationship between academic performance, risky sexual behaviors and sexually transmitted diseases (STDs) diagnosis/treatment?

- a. What is the relationship between academic performance, number of sexual partners and the diagnosis/treatment of sexually transmitted diseases?
- b. What is the relationship between academic performance, anal intercourse and the diagnosis/treatment of sexually transmitted diseases?
- c. What is the relationship between academic performance, condom use and the diagnosis/treatment of sexually transmitted diseases?

1.6 HYPOTHESES

- I. There is a relationship between grade point averages (GPAs) and engaging in risky sexual behavior.
 - a. There is a relationship between grade point averages and the number of sexual partners.
 - b. There is a relationship between grade point averages and engaging in anal intercourse.
 - c. There is a relationship between grade point averages and condom use.
- II. There is a relationship between sexually transmitted diseases (STDs) diagnosis/treatment and academic performance.
 - a. There is a relationship between being diagnosed/treated for gonorrhea and grade point averages.
 - b. There is a relationship between being diagnosed/treated for chlamydia and grade point averages.

- c. There is a relationship between being diagnosed/treated for herpes and grade point averages.
- d. There is a relationship between being diagnosed/treated for the human papillomavirus (HPV)/warts and grade point averages.
- e. There is a relationship between being diagnosed/treated for HIV and grade point averages.

III. There is a relationship between academic performance, risky sexual behaviors and sexually transmitted disease diagnosis/treatment.

- a. There is a relationship between academic performance, number sexual partners and diagnosis/treatment of sexually transmitted diseases.
- b. There is a relationship between academic performance, anal intercourse and diagnosis/treatment of sexually transmitted diseases.
- c. There is a relationship between academic performance, condom use and diagnosis/treatment of sexually transmitted diseases.

CHAPTER 2

LITERATURE REVIEW

Throughout the many years that colleges and universities have existed, the most important goal has been to focus on improving students' academic performance. While seemingly simple this task has been something that administrators are constantly attempting to achieve and has been a major concern. Students are continuously encouraged to obtain and maintain a strong grade point average (a common measure of academic performance) but at times this may seem impossible. Thus, it is important to identify and address as many factors as possible that may negatively affect college student achievement. Research reveals that there are various indicators that serve to predict academic performance in higher education. These factors can negatively or positively affect student success. Some indicators are related to school such as high school grade point average and American College Testing (ACT) score and others are related to social and environmental factors like parental education and health behaviors.

College administrators and health educators are consistently concerned about risky sexual behaviors on their college and university campuses. Many are attempting to formulate programs to prevent the various negative outcomes but unfortunately, there is limited information about how to identify and reduce the rates of the risky behaviors (Jaccard, Levinson, & Beamer, 1995). As previously mentioned in the introduction, there are three key variables that will be analyzed in this study: academic performance (GPA), risky sexual behaviors, and sexually transmitted disease diagnosis/treatment. The following is a literature review discussing the topic thoroughly. This literature review is divided into the following sections: (1) academic performance and health, (2) risky sexual behaviors, (3) sexually transmitted diseases and (4) contemporary college health education. The academic performance and health section provides an overview of the

relationship between student school achievement and various health issues while the risky sexual behaviors section offers an overview of the relationship between academic performance and risky sexual behaviors, such as, multiple sexual partners, condom use and anal intercourse. The sexually transmitted disease section summarizes the current trends in STD transmission among the college student age group followed by the contemporary college health education section that discusses what colleges and universities are currently doing to address student health and provides information on health education programming in K-12.

2.1 ACADEMIC PERFORMANCE AND HEALTH

The main goal for college staff and faculty is to help students succeed in their academic careers, graduate, and land wonderful jobs (Tan, 1991). In order to do this, students need to exhibit strong/high academic achievement. Determining the various factors that can prevent that achievement from occurring is very important to colleges and universities around the country because statistics show that great grade point averages in college are strongly correlated to career success (Tan, 1991).

It has been demonstrated that students' health conditions can negatively affect academic performance (DeBerard, Spielmans & Julka, 2004; Taras & Potts-Datema, 2005). According to the data from the Fall 2010 American College Health Association's National College Health Assessment (ACHA-NCHA), students reported that they have received a lower grade on an exam, or an important project, received an incomplete on assignments, received lower grades and dropped a course or experienced a significant disruption in their dissertation, research or practicum work due to health issues (American College Health Association, 2011).

2.1.1 Stress

In 2003, the NCHA showed that stress was identified as the highest impediment to academic success in college students. Stress outranked various other health impediments and also family, friend, and relationship difficulties. Stress in excessive amounts has been shown to hinder work and contribute to bad habits when negative coping strategies are implemented. When students fail to identify positive coping strategies they are at risk for poor academic performance and dropping out of college (American College Health Association, 2005; Grace, 1997). Other psychological problems besides stress may also have negative impacts on academic performance. Brackney and Karabenick (1995) found that above average levels of psychological distress in college students were significantly related to academic performance. Students that reported higher levels of stress were reported to have higher test anxiety and lower self-efficacy in relation to academics. Also when challenged by difficult situations, students were less likely to seek academic assistance to address the problem.

2.1.2 Upper Respiratory Tract Illness

Upper respiratory tract illnesses have also been linked to poor academic performance in college students. Nichol, D'Heilly and Ehlinger conducted a cohort study that examined the impact of colds and influenza like illnesses on academic performance in university students. When suffering from illness, 40.5% of the respondents missed at least one day of class, 27.8% reported doing poorly on an exam and 46.3% stated they did poorly on an assignment. When breaking down these results, there was also a significant difference in the number of students reporting missed classes (61.6% vs. 30.0%), poor exam results (33.7% vs. 16.9%), and poor

assignment completion (55.8% vs. 37.9%) when suffering from influenza like illnesses compared to a cold (Nichol, D'Heilly & Ehlinger, 2005).

2.1.3 Issues with Sleep

Another health compromising behavior that disproportionately affects college students is sleep deprivation/difficulty. Lack of sleep causes various issues including impaired concentration (Pilcher & Waters, 1997). Many students who are experiencing poor academic performance may not even realize that it could be due to their inefficient sleep pattern. Pilcher and Walters (1997) found that students who were sleep deprived or experiencing sleep difficulty performed worse academically than those who had a normal night's sleep. In another study Dotto (1996) interviewed first-year college students, and observed that sleep habits were relational to academic performance. Students who reported later bedtimes and wake-up times displayed lower levels of academic performance. It was also proposed that for each hour delayed in wake-time, grade point averages would decrease by 0.13.

2.1.4 Alcohol and Other Drug Use

Aside from experiencing an illness of some sort, health compromising behaviors have also been determined to have an effect on academic performance. Alcohol, tobacco and other drugs are continually cited as a concern on campuses by faculty, staff and students. Of those, alcohol misuse seems to be the more problem causing behavior among college students. One of the many consequences of alcohol misuse in college student is the issue it causes with academic performance (Hopps, Davie & Lewin, 1999).

Tobacco, alcohol and other drugs have also been demonstrated to suppress ambition, hinder creativity and disrupt imagination which may lead to an issue with academic performance (Hopps, Davie & Lewin, 1999). There is a substantial amount of research demonstrating the relationship between alcohol consumption and poor academic performance. Wechsler et al. (1998) conducted a nationwide alcohol use study with college students sampling 14,521 students across 116 colleges and universities. The results found that 24% of students reported missing a class due to drinking and 19% reported being behind in schoolwork as a result of drinking. The study also noted that students who engaged in binge drinking (women who consume four or more drinks in a two hour episode and men who consume five or more drinks in a two hour episode) were three times as likely to be behind in schoolwork than moderate drinkers. There has also been an association between grade point averages and levels of alcohol consumption. In a nationally conducted Core Survey, students who held an overall A grade point average reported consuming 3.4 drinks, students with a B grade point average consumed 4.5 drinks, a C grade point average students consumed 6.1 drinks and students who were averaging a grade point average of either a D or F reported consuming 9.8 drinks (Presley, Meilman & Cashin, 1996).

Illicit drug use has also been shown to play a significant role in academic achievement among college students. Multiple studies have found that students who smoke marijuana and use other illicit drugs have lower grade point averages, higher rates of absenteeism, and higher rates of school dropout (Brook, Brook, Rosen & Rabbitt, 2003; Lynskey & Hall, 2000). After adjusting for other factors such as socioeconomic status and high school academic performance, the negative association between marijuana use and academic performance is still significant. Of all behaviors smoking seems to be the strongest predictor of academic success (Musgrave-Marquart, Bromley & Dalley, 1997). Smoking also seems to be associated with other health

compromising behaviors such as heavy drinking and having multiple sexual partners (Emmons, Wechsler, & Abraham, 1998).

While the relationship between each of these health concerns and academic performance is important, the purpose of this study is to dissect the relationship between academic performance and concerns related to sexual health.

2.1.5 Sexual Health

Sexual health is another concern in regards to college students' academic performance. There are various factors that contribute to adolescent and young adult sexual behavior such as, environmental factors and individual factors. Environmental factors include, but are not limited to poverty, cultural norms, family and school. Individual factors include self-efficacy, communication and cognitive maturity (Jessor & Jessor, 1977). The interaction of these two factors, environmental and individual, assists in the determination of whether or not a risky sexual behavior will occur.

Improving overall academic performance is important in reducing long term sexual risks in young adults (Taylor-Seehafer & Rew, 2000). Studies have shown that the context of school is among the most critical environmental forces that aides in the influence of adolescent risky behavior. Poor academic performance is an important factor in the occurrence of health compromising behavior such as alcohol use and unprotected sexual intercourse and students who are not attending school have an increased prevalence of multiple health-risk behaviors. (Resnick et al., 1997).

Poor academic performance, negative attitudes towards school and low educational aspirations have been shown to be predictors of early initiation of intimate sexual activity (Coker

et al., 1994; Costa, Jessor, Donovan, & Fortenberry, 1995; Resnick et al., 1997). In the cross-sectional analysis of the Youth Risk Behavior Survey, Coker et al. (1994) analyzed the frequency of self-reported early sexual intercourse in relation to behavioral and demographic factors, race and gender. The study reveals that white males with the self-perception of being the best in their class in regards to academic standing were associated with a reduced risk of sexual initiation at a younger age. For white females it was demonstrated that being in the middle or the bottom of the class increased the risk of sexual initiation at a younger age. Thus, those who were performing well academically (or at least perceived themselves to be) tended to be at a decreased risk for early sexual initiation.

Negative school experiences have also been associated with early sexual activity (Hansen, Stroh, & Whitaker, 1978). Students who perform poorly may initiate sexual activity at an earlier age as an alternative to continuing with negative school experiences. It has been evident for years that students who have poor academic performance tend to face more difficulties in life than their higher achieving counterparts. Various studies have shown that girls who perform poorly in school, have low academic aspirations, and have minimal motivation are more likely to become pregnant at an early age. It has also been suggested that compared to their counterparts who do not become pregnant earlier in life, young mothers are more likely to leave school early, be socioeconomically disadvantaged and experience marital instability. (Fergusson & Woodard, 2000; Kelpinger, Lundberg & Plotnick 1995).

In a study conducted by Kelpinger, Lundberg and Plotnick in 1995 of 2,795 women, it was found that those who gave birth before the age of 20 completed fewer years of high school by one to three years in comparison to those who did not have children during this time. This correlation was still present after taking into account the differences in each of the women's

backgrounds. They concluded that early pregnancy reduced educational attainment anywhere from one to three years. Fergusson and Woodard, 2000, studied a cohort of 520 young women from birth to 21 years of age to examine the relationship between teenage pregnancy and educational underachievement. Results were similar to other studies that identified that women who become pregnant at an early age are at an increased risk for poor educational achievement. While it can be argued that early pregnancy causes poor educational attainment, this study revealed that for the majority of the participants pregnancy occurred after they dropped out of school. Thus pregnancy rates might be elevated in those who drop out of school as opposed to drop out rates being higher in those who become pregnant (Fergusson and Woodard, 2000).

2.2 RISKY SEXUAL BEHAVIORS

Risky sexual behavior is a leading risk factor in the rate increase of sexually transmitted diseases in adolescents and young adults. Risky sexual behavior is defined as any sexual activity that can lead to an increase risk of contracting sexually transmitted diseases or becoming pregnant (Aral, 1994). Studies have identified particular behaviors that can place individuals at a higher risk for sexually transmitted diseases and pregnancy (Capaldi, Stoolmiller, Clark, & Owen, 2002; MacDonald et al., 1990; Santelli, Brener, Lowry, Bhatt & Zabin, 1998; Staton et al., 1999). These behaviors include early initiation of sexual activity, multiple sexual partners, inconsistent condom use, and high-risk sexual behaviors (McCree, Wingood, DiClemente, Davies, & Harrington, 2003; Millstein & Moscicki, 1995; Yarber, Sayad, & Strong, 2010). Evidence has also shown that risky sexual behaviors are interrelated. A higher risk in one behavior is associated with increased risk towards another behavior. For example, higher numbers of sexual partners is associated with lower levels of condom use (Capaldi et al., 2002).

It is important to recognize these risk behaviors in the college student population because research indicates that 86% of college students are sexually active (ACHA, 2006; Douglas et al., 1997; Lewis, Miguez-Burbano, & Malow, 2009). Institutions of higher education can also provide an important and ideal setting for reaching this particular high risk age group and aid in reducing these risky behaviors. When students transition out of high school and into college they experience changes in their romantic relationships, living arrangements and education, among other things. In particular, changes in living arrangements and school status may provide an opportunity to engage in risky sexual behaviors (Bachman, Wadsworth, O'Malley, Johnston, & Schulenberg, 1997; Osgood, Ruth, Eccles, Jacobs, & Barber, 2005). While all of these behaviors are important to consider, multiple sexual partners, inconsistent condom use, and high-risk sexual acts will be further explored.

2.2.1 Multiple Sexual Partners

While multiple sexual partners can range anywhere from two to twenty or more, Shapiro (1999) determined that a person was considered to be at high sexual risk if he/she has more than three sexual partners. Having multiple sexual partners puts you at a greater risk for contracting a sexually transmitted disease. Greater numbers of sexual partners increases the likelihood that one of the chosen partners will be infected (Ericksen & Trocki, 1992). According to a national survey, those with five or more partners in the past five years were more likely to report having contracted a sexually transmitted disease throughout their lifetime than those with fewer partners (Leigh, Temple & Trocki, 1993).

While in college, young adults partake in more casual sexual experiences known as “hooking up” (Grello, Welsh, & Harper, 2006). This may lead to an increase number of partners

and sexual experiences. Approximately 14.4% of 18 to 24 year old college students reported having four or more partners throughout their life (Center for Disease Control, 2009). Those aged 10 to 19 and 20 to 24 are more likely to have multiple sex partners rather than a monogamous, long-term relationship compared to all other age groups (Center for Disease Control, 2009). It has also been demonstrated that males in this particular age group are more likely to report having multiple partners than their female equals (Durbin et al. 1993). While the partners of adolescents and young adults are not concurrent there are often multiple sequential partners in a shorter span of time because of the instability that is typically found in many of their relationships.

The number of lifetime sexual partners is also strongly related to the age of initiation for sexual activity. There are higher levels of sexual activity across the life span and higher frequency of intercourse to go along with increased number of partners (Kinsey, Pomeroy, & Martin, 1948; Thorton, 1990; Smith, 1991). In a longitudinal study conducted by Capaldi et al., it was determined that a younger age of sexual intercourse initiation was associated with a higher number of sexual partners (2002). This is significant because currently 48% of American high school students have engaged in sexual intercourse (CDC, 2008a). By the age of 18, when young adults are entering college, 62% of males and 70% of females have experienced their first sexual intercourse encounter. At the time of college graduation between the ages of 22 and 24, these percentages increase to 89% and 92%, respectively (Mosher, Chandra, Jones, 2005).

2.2.2. Inconsistent Condom Use

Although not 100% effective, condoms can be a suitable form of sexually transmitted disease prevention. According to UNAIDS, “the male latex condom is the single, most efficient,

available technology to reduce the sexual transmission of HIV and other sexually transmitted infections” (UNAIDS, 2009). When used incorrectly, the protective effect may be diminished even if condoms are being used during each and every sexual act of intercourse (Mosher & Jones, 2010). The World Health Organization stated that condoms have a 2% failure rate with perfect use but the typical failure rate, which takes into account human error, is 15% (WHO, 2011). Condoms are 90% to 95% effective in preventing the human immunodeficiency virus (HIV) and individuals that use condoms consistently are 10 to 20 times less likely to contract HIV when exposed to the virus than those who use condoms incorrectly or inconsistently (Pinkerton & Abramson 1997). This is of great importance because the male condom is one of the oldest, most widely available, and most commonly used birth control method (CDC, 2006). It is also the only method (except for abstinence) that protects against many sexually transmitted diseases including HIV. In a study conducted by Winner et al. 2006, that followed 82 female university students it was shown that consistent condom use may decrease the incidence of human papillomavirus (HPV). The incidence of HPV infection was 37.8 per 100 patient-years for those whose partners used condoms during all acts of sexual intercourse. That number increased to 89.3 per 100 patient-years for females whose partners used condoms less than five percent of the time.

Similar results have been shown in studies surrounding other sexually transmitted diseases. A meta-analysis conducted by Davis and Weller (1993) studied condom effectiveness in heterosexual couples in which one partner was HIV positive. Results showed an 80% reduction in HIV transmission when condoms were used consistently compared to no condom use. Best-case and worst-case scenarios ranged from 35-94% (Davis & Weller, 1993). A study conducted by Sanchez et al (2003) followed 917 female sex workers in Lima, Peru and examined

the women monthly for sexually transmitted diseases including chlamydia and gonorrhea.

Women who reported consistent condom use had a 62% risk reduction in acquiring gonorrhea and a 26% reduction in chlamydia compared to women who did not report consistent condom use (Sanchez et al., 2003).

It is also important to note that the attitudes towards condom use differ between males and females. While both sexes agree that condoms are the best way to prevent sexually transmitted diseases, their reasons for inconsistent use vary considerably (Grady, Kelpinger, & Nelson-Wally, 1999). With the increase in use of hormonal methods (pill, patch, Depo-Provera shot, etc.) as a preferred choice of birth control among females men have begun to perceive the use of condoms as being redundant even though hormonal methods do not prevent the transmission of sexually transmitted diseases. Men also make the decision not to don condoms during every sexual intercourse episode because of the perception that condoms interfere with pleasure and intimacy (Skidmore & Hayter, 2000; Crosby, Yarber, Sanders, & Graham, 2005). Also with the increase in hormonal methods that are monitored and controlled by women, men may believe that contraception is the woman's responsibility and this leads to lack of condom use (Skidmore & Hayter, 2000). The resistance of males to use condoms has placed increase pressure on women to negotiate condom use which is not always ideal because of lack of experience in negotiation and the cultural stigma related to female sexual assertiveness (Rademakers, Mourhaan, & de Neef, 2005).

Considering that condoms have consistently been shown to decrease the chances of pregnancy and contracting sexually transmitted diseases and HIV/AIDS they are still not being used during every sexual intercourse episode. Adolescents and young adults commonly perceive themselves as being invincible and believing that they will not contract a sexually transmitted

disease leading them to engage in high-risk sexual behavior (WHO, 2004). Results from the 1995 National College Health Risk Behavior Survey showed that 27.9% of the respondents reported consistent condom use during the 30 days prior to the survey (Douglas et al., 1997). This number increased to 35% in 2006 (ACHA, 2006). Lack of knowledge regarding sexually transmitted diseases also has not been a reason why adolescents and young adults choose not to use condoms during each sexual intercourse encounter. A study by James, Reddy, Taylor and Jinabbai (2004) revealed that among adolescents and young adults aged 15 to 21 years revealed that although this population is aware of risk of unprotected sexual intercourse and the effectiveness of condoms at preventing sexually transmitted disease condoms use was still inconsistent.

2.2.3 High Risk Sexual Acts

For a person who is sexually transmitted disease-free, each sexual encounter presents the risk of contracting a sexually transmitted disease. As previously mentioned, the young adult population is at particularly higher risk with the highest rates of incidence occurring in this population. The risk of an individual acquiring an illness varies based on many factors including inconsistent condom use and multiple sexual partners. Another risk factor that will be analyzed in this study is engaging in anal intercourse. While inconsistent condom use and multiple sexual partners are risky sexual behaviors, participation in heterosexual or homosexual anal intercourse is viewed as a high risk sexual act (Reinisch, Hill, Sanders, & Ziemba-Davis, 1995).

Various studies have shown that anal intercourse is the riskiest of sexual practices in the transmission of HIV. This is true for those who identify as heterosexual, homosexual and bisexual. The risk is greater increased when a condom is not used and the act is receptive

(Buchbinder et al., 1996; Vittinghof et al., 1999). A study conducted by Varghese et al. (2001), that reviewed cross-sectional studies, cohort studies and models to estimate the per act odds ratio of contracting HIV for various sex acts, found that anal intercourse (receptive and insertive) is riskier than all other sexual acts. Receptive anal intercourse was five times riskier than receptive vaginal intercourse and insertive anal intercourse was 1.3 times riskier than insertive vaginal intercourse (Varghese, Maher, Peterman, Branson & Steketee, 2001). Choosing safer sexual acts helps to reduce the risk of contracting HIV and many homosexual men have adopted this practice (Schacker, Collier, Hughes, Shea & Corey, 1996).

There are various factors that lead to the spread of sexually transmitted diseases. They typically fall into three categories: behavioral, social and biological (Eng & Butler, 1997). While all three factors are of importance when combatting this epidemic the scope of this literature review will be surrounding behavioral factors as mentioned above.

2.3 SEXUALLY TRANSMITTED DISEASES

Although there are both positive and negative outcomes associated with unhealthy sexual behaviors, the negative outcomes tend to outweigh the positives and are more associated with the college student population. With college students these negative outcomes may include damage to social reputations, unintended pregnancies and sexually transmitted diseases including HIV/AIDS.

In 2005, sexually transmitted diseases represented four of the top five frequently reported infectious diseases in the United States to the CDC (CDC, 2008a; National Center for Health Statistics, 2007). Generally speaking there are two different types of STDs: bacterial and viral. Bacterial STDs are often curable such as chlamydia, whereas, viral STDs like herpes are

incurable but can be treated. However, for sexually transmitted diseases that can be treated, when left untreated, they can result in pelvic inflammatory disease and infertility (Cates, 1991). It is also important to know that when an individual is infected with a STD, he/she is more likely to become infected with HIV when they have sexual contact with someone who is HIV-positive (Holmberg et al., 1988; Pepin et al., 1989).

Another issue that being seen more in regards to the treatment of sexually transmitted diseases is antibiotic resistance. The emergence of antibiotic-resistant gonorrhea is making it difficult to treat this particular STD. Previously prescribed antibiotics such as ciprofloxacin (a fluoroquinolone) are no longer working to cure the illness. This trend in antibiotic resistance was first noticed in the late 1990s and early 2000s on the West Coast and in Hawaii. By 2006 it was being seen across the country and in all populations and in 2007, the CDC stopped recommending fluoroquinolones as treatment for gonorrhea. Currently, the CDC recommends dual therapy treatments to address this issue and is continuously monitoring the resistance and encouraging new treatment regimens (CDC, 2013a)

While there are over 25 different sexually transmitted diseases for the purpose of this study my attention will be on five: gonorrhea, chlamydia, genital herpes, human papillomavirus (HPV)/genital warts and HIV. Gonorrhea is a very common STD that is caused by a bacterium. The CDC estimates that 820,000 people are infected annually in the United States and approximately 70% of those infected are young people ages 15 to 24 years. The most commonly reported bacterial STD in the United States is chlamydia. An estimated 2.86 million infections occur annually. Genital herpes, a viral sexually transmitted disease affects 776,000 new people annually in the United States. Since it cannot be cured it is estimated that about one out of six people between the ages of 14 to 49 are living with the infection. The human papillomavirus is

the most common sexually transmitted disease amongst all of them. It is so common that nearly all sexually active people will have at least one type at some point throughout the course of their lives. In the United States alone there are 79 million people affected and approximately 14 million new cases occur each year. The final sexually transmitted disease that will be analyzed in this study is HIV. The Center for Disease Control and Prevention estimates that there are approximately 1.1 million people living with HIV in the United States. Overall there are 20 million new sexually transmitted disease cases in the United States annually (CDC, 2013).

Similar to other health issues, risky sexual behaviors can lead to the contraction of sexually transmitted diseases that may compromise a student's academic performance. Based on this information I am going on the assumption that I will see similar effects on academics caused by the presence of a sexually transmitted disease, the effects of the symptoms and the stress associated with the contraction of a STD.

2.4 CONTEMPORARY COLLEGE HEALTH EDUCATION

Contemporary college sexual health education programs are often built on the premise that if one heightens awareness of the negative consequences associated with sexual intercourse then students will be less likely to engage in the behavior. These types of programs use scare tactics with the goal being to scare students into not partaking in the behavior for risk of a negative outcome (i.e. an unplanned pregnancy or sexually transmitted disease). While doing so, the reality of the situation is blatantly ignored: college students are indeed engaging in sex.

Unlike schools that serve students in grades K-12, higher education institutions do not have national guidelines to assist with developing and/or implementing effective sexual health education programs. Recently the Center for Disease Control and Prevention, Division of

Adolescent and School Health conducted a review of effective health education programs and with input from health educators completed a report known as the CDC's *Elements of an Effective Health Education Curriculum*. This report provided 15 characteristics of effective programming as listed below:

1. *Characteristic A:* Focuses on clear health goals and related behavior outcomes
2. *Characteristic B:* Research-based and theory-driven
3. *Characteristic C:* Addresses individual values, attitudes, and beliefs
4. *Characteristic D:* Addresses individual and group norms that support health-enhancing behaviors
5. *Characteristic E:* Focuses on reinforcing protective factors and increasing perceptions of personal risk and harmfulness of engaging in specific unhealthy practices and behaviors
6. *Characteristic F:* Addresses social pressures and influences
7. *Characteristic G:* Builds personal competence, social competence and self-efficacy by addressing skills
8. *Characteristic H:* Provides functional health knowledge that is basic, accurate, and directly contributes to health-promotion decisions and behaviors
9. *Characteristic I:* Uses strategies designed to personalize information and engage students
10. *Characteristic J:* Provides age-appropriate and developmentally-appropriate information. Learning strategies, teaching methods, and materials
11. *Characteristic K:* Incorporates learning strategies, teach methods, and materials that are culturally inclusive
12. *Characteristic L:* Provides adequate time for instruction and learning
13. *Characteristic M:* Provides opportunities to reinforce skills and positive health behaviors

14. *Characteristic N*: Provides opportunities to make positive connections with influential others

15. *Characteristic O*: Includes teacher information and plans for professional development and training that enhance effectiveness of instruction and student learning (CDC-NCCDPHP, 2008b)

Another set of standards used for students in grades K-12 are the National Health Education Standards (NHES). This set of standards provides guidelines in which to follow when developing health education curriculum. Each standard provides grade appropriate objectives.

The standards are as follows:

1. *Standard 1*: Students will comprehend concepts related to health promotion and disease prevention to enhance health
2. *Standard 2*: Students will analyze the influence of family, peers, culture, media, technology and other factors on health behaviors
3. *Standard 3*: Students will demonstrate the ability to access valid information and products and services to enhance health
4. *Standard 4*: Students will demonstrate the ability to use interpersonal communication skills to enhance health and avoid or reduce health risks
5. *Standard 5*: Students will demonstrate the ability to use decision making skills to enhance health
6. *Standard 6*: Students will demonstrate the ability to use goal-setting skills to enhance health
7. *Standard 7*: Students will demonstrate the ability to practice health-enhancing behaviors and avoid or reduce health risks

8. *Standard 8*: Students will demonstrate the ability to advocate for personal family, and community health

While these characteristics and standards can be used to address a wide range of health content areas, there are also guidelines that specifically help to identify effective sexual health programming in grades K-12. The Sexual Information and Education Council of the United States (SIECUS) guidelines were developed with the idea that sexuality education should be a part of every grade from kindergarten to 12th grade and age appropriate (SIECUS, 2004). In 1991, the SIECUS National Guidelines Task Force released the first *Guidelines for Comprehensive Sexuality Education: Kindergarten-12th Grade*. The task force was made up of educators, health professionals and representatives from national organizations that focus on adolescent development, education, and sexuality. This guide has been used to help implement and develop new programs and to evaluate and improve current programs. Throughout the years the guidelines have changed to reflect new information and the current state of sexuality education. Within the guidelines, SIECUS developed six main concepts (SIECUS, 2004):

1. *Human development*: interrelationship between physical, emotional, social and intellectual growth
2. *Relationships*: Between friends, families and lovers
3. *Personal skills*: development of personal and interpersonal skills
4. *Sexual behavior*: variety of ways to express oneself sexually
5. *Sexual health*: provide information about the unwanted consequences of sexual behavior
6. *Society and culture*: looks at how social and cultural environments affect the way individuals express their sexuality

These concepts provide the framework for the guidelines and how they should be used. Each concept consists of six to seven topics ranging from puberty to sexuality in education. Each concept also contains age appropriate messages (SIECUS, 2004).

Another important construct set forth in the guidelines is the need for goals. Each program should strive to promote adult sexual health through information, attitudes, values and insights, relationships and interpersonal skills and responsibility. The guidelines provide a tool to help administrators and others who are implementing sexuality education programs evaluate their effectiveness. There is also a STD/HIV checklist provided to make sure that important information about STDs and HIV is covered (SIECUS, 2004). The SIECUS guidelines seem to be the most widely accepted guidelines for those implementing and evaluating sexuality education programs.

Current sexually transmitted disease prevention programs on college and university campuses place heavy emphasis on education and providing information regarding the risks of sexual intercourse but findings consistently show that knowledge in regards to STD transmission does not necessarily deter risky sexual behavior (Boyer, Tschann, & Schafer, 1999). The majority of students know which activities put them at higher risk for contracting a sexually transmitted disease and continue to engage in risky sexual behaviors. With the rates of sexually transmitted disease contraction among the college student population another approach is needed and guidelines and standards need to be create to provide administrators with some type of framework for developing and implementing these programs.

2.5 COLLEGE STUDENT ACTUAL AND PERCEIVED NORMS REGARDING SEXUAL BEHAVIOR

Risky and promiscuous sexual behavior is frequently viewed as a part of the college experience. However, studies have shown that students have shown that students perceive their peers to be engaging in sexual behaviors at a higher rate than is actually reported (Martens et al., 2006; Page, Hammermeister & Scanlan, 2000). In a study conducted by Martens et al. (2006), 833 college students were asked to estimate the sexual behaviors among their peers. The results showed that students have a misperception of the social norms in regards to sexual behaviors on campus. Students overestimated the perceived frequency of oral, vaginal and anal intercourse as well as the number of sexual partners. The perceived frequency of oral sex was 3.56 while the reported frequency was 2.62. For vaginal intercourse the perceived frequency was 4.04 and the reported frequency was 3.16. In terms of anal intercourse, the perceived frequency was 2.14 and reported frequency was 1.09. Similar results were seen when students were asked questions regarding the number of sexual partners. In the past 12 months the perceived frequency was 4.79 but the reported frequency was 2.55 (Martens et al., 2006).

Similar results were found in a study conducted by Page et al, (2000). Seven hundred and twenty-five students completed a survey providing information about the perceived prevalence of sexual activity on campus and self-reports of sexual activity. The percentage of females who reported sexual intercourse in the past month was 49.7% and the percentage of males was 42.9%. Both percentages were lower than the perceived percentage of females and males engaging in sexual activity, 60.1% and 54.6%, respectively. The results were the same for students who reported having more than four sexual partners in a lifetime. For male students, 30.1% and for female students 28.9% reported having four or more sexual partners. However, students

perceived that 53.3% of males and 44.6% of females had four or more sexual partners. Students were also asked about abstaining from sexual intercourse until marriage. Approximately 22.6% of male and 25.1% of female students reported that they have decided to abstain from sexual intercourse until marriage. It was perceived that 12.6% of males and 19.2% of females made this decision (Page et al., 2000).

While it is thought that “everyone is doing it” on a regular basis and engaging in promiscuous behavior, studies show that students are not as immersed in this culture as initially perceived (Page et al., 2000). Students are engaging in sexual activity at lower rates than perceived and have fewer sexual partners than perceived. It is important to recognize the relationship between perceived normative behavior and personal behaviors. This tendency to overestimate sexual activity may increase the risk of engaging in risky sexual behaviors. As students continue to believe that the social norm is to engage in sexual activity more often and have multiple sexual partners it becomes a self-fulfilling prophesy. In general college students overestimate sexual behavior social norms and students are not “hooking up” and engaging in promiscuous activity as much as people think (Martens et al, 2006; Page et al., 2000).

2.6 THEORY

The Problem Behavior Theory (Jessor & Jessor, 1977) will be used as a theoretical framework. Typically used to describe adolescent behavior, this theory will be applied to young adults specifically those in their early college years for this study (Donovan & Jessor, 1985; Jessor, 1987). The aim of the theory will be to organize the variables and assist in identifying proneness to engage in risky sexual behaviors.

The Problem Behavior Theory is driven by a social-psychological perspective. It focuses on three systems: personality, perceived environment and behavior. The occurrence of the behavior is considered an outcome of an interaction between personality and environmental influences. These systems interrelate and are organized in a manner where they play upon each other and implicate whether the likelihood of the occurrence of the problem behavior, in this case risky sexual behavior, is greater or lesser.

2.6.1 Personality System

Within the personality system there are three main psychological structures: motivational instigation, personal belief, and personal control. In the motivational instigation structure when high value and/or expectations are placed on a goal it implies a higher likelihood of action than does low value and/or expectations. For example, if high values and expectations are placed on earning good grades then the goal of achievement will be high and one is likely to achieve good grades. This can also be seen in the opposite direction. If low value and expectations are placed on earning good grades then little value will be placed on achieving that goal. In fact, it might not even be considered a goal. The motivational instigator structure consists of seven variables that may influence the direction of action: value on academic achievement, value on independence, value on affection, the independence-achievement value discrepancy, expectation for academic achievement, expectation for independence and expectation for affection.

The second structure in the personality system is personal belief. The role of this structure is to work to constrain the motivational instigators. The four variables in this structure are social criticism, alienations, self-esteem, and internal/external locus of control. Social criticism reflects the degree to which the values are accepted or rejected by society. This ties into

the idea of social norms of college campuses in regards to sexual behaviors and what is or is not acceptable. Alienation refers to the feeling of isolationism and lack of involvement with others. Self-esteem is the appraisal of one's worth. High self-esteem serves as a barrier to engaging in deviant behavior such as risky sexual behavior. Those with little self-esteem are less likely to know their worth and more likely to engage in deviant behavior because of the idea that they have little to lose. The last variable deals with loci of control, internal and external. Internal and external loci of control look at conformity. External locus of control protects against nonconformity.

The third and final structure of the personality system is personal control. It is the control structure that controls against normative behavior. The three variables in this structure are attitudinal tolerance of deviance, religiosity, and discrepancy between positive and negative functions of behaviors. Attitudinal tolerance of deviance refers to the degree of wrongness one associates with the behavior. High attitudinal tolerance of deviance controls against engaging in the behavior. Religiosity is based on general involvement with religious activities. It is also a protective factor. The discrepancy between positive and negative functions of behavior refers to the reason for and against engaging in the behavior. When the favored functions are negative there is greater control against engaging in the negative behavior.

Motivational instigation, personal belief and personal control interact to balance the pressure towards engaging in problem behaviors. The motivational instigators drive the directionality and the personal belief and personal control structures constrain against the behavior.

2.6.2 Perceived Environment System

The perceived environment consists of two structures, distal and proximal. The distal structures characterize to social context that one is located, that is, parent and family oriented versus friend or peer oriented. Those that are oriented towards parent and family are less prone to problem behavior. Within this structure there are six variables: perceived support from parents, perceived support from friends, perceived controls from parents, perceived controls from friends, parent-friends compatibility, and parent-friends influence. When one's environment is high in support and controls they are less likely to engage in problem behavior. This is especially true with the supports and controls are coming from the parents. This is usually associated with the strictness of a parent. When parents are less strict and more forgiving then controls may be low. When support and controls are low, one is not regulated and is more likely to engage in problem behavior. Compatibility and influence are also important. When parents and family expectations and values do not coincide with friends and peers expectations then young adults' response will correspond to their perception of greater past and present influence. When students are younger parents have greater influence but as they get older and socialize more, then peers have a greater influence. So students tend to lean towards peers in this situation. When family and friends share the same opinion on the activity (whether acceptable or unacceptable) there is a greater likelihood that the problem behavior is less likely to occur. While in college peer influence tends to be stronger than parental influence. Thus creating a perceived environment in which there are probably less controls due to lack of parental influence on college campuses.

The second structure in the perceived environment system is the proximal structure. The three variables that are associated with this structure are friends' approval-disapproval for problem behavior, parental approval-disapproval for problem behavior, and friends' model for

problem behavior. In an environment with perceived support, engaging in problem behavior can be a means of gaining approval and a way to avoid rejection. If one feels that engaging in sexual behavior and drug use makes them belong then he/she is more likely to engage in those behaviors. By not engaging in those behaviors then one may be rejected which can lead to self-esteem issues. The environmental prevalence of models carries a few important implications. It provides the opportunity to learn how to engage in a behavior. This structure is important to note because conformity plays an important role in the lives of young adults. There is the need to belong and not feel left out. This may lead to engaging in activities that some normally may avoid due to the need to feel accepted.

The importance of models and support vary with closeness of the relationship. This closeness is reflective of the degree of involvement that those that are models and sources of support have with the young adult. When friends are the models and provide support, their influence is greater than perceived models and support in general society.

Overall the perceived environment system examines the social controls against the problem behavior (the distal structure) and the perceived models and support for problem behavior (the proximal structure).

2.6.3 Behavior System

The third and final system of the Problem Behavior Theory is the behavior system. To begin with, it is important to describe behavior in the context that it will be used.

Behavior refers to behavior that is socially defined as a problem, a source of concern, or as undesirable by the norms of conventional society and the institutions of adult authority

and its occurrence usually elicits some kind of social control response (Jessor & Jessor, 1977, p. 33).

The first structure of the behavior system is the problem behavior structure. The seven variables in this structure (marijuana use, sexual intercourse, activist protest, drinking, problem drinking, general deviant behavior and multiple problem-behavior index) are focused around actions that are considered by larger society to be inappropriate and undesirable and require the exercise of social controls.

The second part of the behavior system is the conventional structure. Church or formalized religious activities and academic performance work as constraints or alternatives to engaging in problem behavior. When time and effort are invested in church or school, those activities would interfere with time and opportunity to engage in problem behavior.

By using the Problem Behavior Theory I am hoping to gain a better insight on the aforementioned research questions. The goal is to identify (if any) the differences between students with higher grade point averages and students with lower grade point averages in regards to their sexual risk behaviors. Hopefully this study will help lead to the development of new multi-disciplinary sexual education programs that can be widely disseminated in colleges and universities.

2.7 SUMMARY AND CONCLUSION

The findings from previous research suggest that there is a strong relationship between academic performance, risky sexual behaviors, and sexually transmitted diseases. However, most of this research is centered on high school students with little information about how this relationship presents itself in college students. Thus this study proposes to address the gaps in

literature regarding the college student population and to thoroughly explore 1) the relationship between academic performance and risky sexual behavior among students within a university setting, 2) the relationship between sexually transmitted diseases and academic performance, and 3) the relationship between academic performance, risky sexual behaviors and sexually transmitted diseases. In order to address these research questions data from the National College Health Assessment II will be analyzed.

CHAPTER 3

METHODOLOGY

Improving academic performance is important in reducing long term sexual risks (Taylor-Seehafer & Rew, 2000). While poor academic performance in relation to sexual behaviors has been vastly studied in adolescents, it has been overlooked in the young adult college student population. According to Hittner and Kryzanowski (2010), few, if any, published studies have examined the relationship between academic performance and unsafe sexual activity in college students. Additional research is needed to better understand the relationship between academic performance and high risk sexual behaviors among the college students.

This study will involve the exploration of three relationships. The first is to examine the relationship between academic performance and risky sexual behaviors (e.g. multiple sexual partners, condom use and anal intercourse). Secondly, the study will seek to gain better insight on the relationship between sexually transmitted diseases and academic performance among college students within the United States. In addition, the relationship between academic performance, risky sexual behaviors and sexually transmitted diseases will be analyzed.

The following research questions were developed to address the relationship (positive or negative) that academic performance has on risky sexual behavior, how sexually transmitted diseases may or may not affect academic performance and the relationship between all three variables.

3.1 RESEARCH QUESTIONS

- I. What is the relationship between academic performance and risky sexual behavior among students within a university setting?
- II. What is the relationship between sexually transmitted disease diagnosis/treatment and academic performance?
- III. What is the relationship between academic performance, risky sexual behavior and sexually transmitted disease diagnosis/treatment?

3.2 PARTICIPANTS

In this study, the 2010 Fall NCHA-II data set is analyzed. A total of 42 postsecondary institutions ranging from public to private and two-years to four-years or above, respectively, self-selected to participate in the assessment. Campuses were located in the Northeast, Midwest, South, West, and outside of the United States. The majority of the campuses were located in small cities (population 50,000-249,000). Campus sizes ranged from less than 2,500 students to more than 20,000 students. The Carnegie Classifications were Associates Colleges, Baccalaureate Colleges, Masters Colleges and Universities, Research Institutes and Special Focus Institutions. Two institutions were considered miscellaneous/not classified.

A total of 30,093 students aged 18-92 years of age completed the survey. For the purposes of this study only those aged 18-24 years were analyzed. I have also chosen to exclude participants who responded that they were *married/partnered, divorced, separated* or *other*, those who reported more than 20 sexual partners and students who responded N/A as their grade point average were also excluded from my study. I also made the decision to exclude those respondents who identified as transgender. I have chosen to study only those aged 18-24

years because this is the traditional college student age range. Those who identified as married/partnered, divorced, separated or other were excluded because people in these types of relationships are less likely to engage in risky behavior and have monogamous relationships. Also within the confines of a marriage the behaviors being viewed as risky are not identified as such. Students who reported a grade point average of N/A were also excluded because these students did not have a GPA. Various reasons for this is that many of the students were freshman and transfer students that had not completed a semester at the particular institution at the time of the survey. Those who reported 20 or more partners and identified as transgender were excluded because the number of participants was not great enough to produce reliable results. The final sampled population for this study was 21,264 participants. Females accounted for 65.8% of the population and the majority of the participants were undergraduate (96.4%) students. Sixty-eight percent were White-non Hispanic, 7.8% Black-non Hispanic, 9.9% Hispanic or Latino/a, 14.6% Asian or Pacific Islander, 2.1% American Indian, Alaskan Native or Native Hawaiian, 3.8% Biracial or Multiracial, and 2.4% reported other with 94% of the students identified themselves as heterosexual.

3.3 INSTRUMENT

The National College Health Assessment II (NCHA-II) is a nationally disseminated research survey organized by the American College Health Association. The survey addresses topics such as health, health education and safety, alcohol, tobacco and drug use, sexual behaviors and contraception, weight, nutrition, exercise, mental health and physical health. The National College Health Assessment II (NCHA-II) is largely based on the original NCHA that was first issued in 2000. The NCHA-II was launched in 2008 after the American College Health

Association Advisory Committee determined that it was important to update the survey with emerging health issues.

The NCHA-II is used by self-selected postsecondary institutions of higher education across the United States. Students self-report on information regarding their current health status and health behaviors, access to health information, attitudes related to health information, the effect of health issues on their academic performance and their perceptions of behavioral norms of other students (American College Health Association; 2003). Universities and colleges use this information as a needs assessment to develop interventions and preventions for their student population. The NCHA-II is currently the largest known comprehensive data set based on the health of college students. Table 3.1 presents select questions from the survey that will be used in the analysis.

Table 3.1

Selected Items from the NCHA-II

Question	Response Options
Within the last 12 months, how many partners have you had oral sex, vaginal intercourse, or anal intercourse? (if you did not have a sex partner within the last 12 months, please enter 00. If less than 10, enter 01, 02, 03, etc.)?	Open ended response, Possible options can range from 00 to 99
Within the last 30 days, did you have: oral sex, vaginal intercourse, anal intercourse (Please mark the appropriate column for each row)?	Yes No, have done this sexual activities in the past but not in the last 30 days No, have never done this sexual activity
Within the last 30 days, how often did you or your partner(s) use a condom or other protective barrier (e.g., male condom, female condom, dam, glove) during oral sex, vaginal intercourse, anal intercourse (Please mark the appropriate column for each row)?	Have not done this sexual activity during the last 30 days N/A, never done this sexual activity Never Rarely Sometimes Most of the time Always
Within the last 12 months, have you been diagnosed or treated by a professional for any of the following? Chlamydia Genital Herpes Genital Warts/Human Papillomavirus (HPV) Gonorrhea Human Immunodeficiency Virus (HIV)	Yes No

Note. Source: American College Health Association, 2008.

*Only question options used in analysis are provided

3.4 PROCEDURES

Approval for use of the data was requested on February 3, 2012. In order to gain access to the data an ACHA-National College Health Assessment Data Use Request Form had to be submitted to the American College Health Association. Approval was granted on February 21, 2012. After receiving approval to use the data, the Institutional Review Board was contacted and the study was approved on March 8, 2012. The data was received via the United States postal mail service in the form of a disc compatible with SPSS. School codes and other personal identifiers were removed and did not accompany the data on the disc. The data was cleaned and

filtered so that I only had the variables pertaining to the study. The information was later entered into SPSS 19.0 where it was analyzed.

3.5 RESEARCH VARIABLES

The following variables were used for analysis. Unless noted all codes remained the same as in the original database:

- **Age:** Participants were asked to provide their age in years. This is a scale variable that allowed students to enter an age ranging from 1-99 years of age.
- **Gender:** Participants were asked to identify their gender on the survey. The options were *female*, *male* and *transgender*. *Female* was coded as 1 and *male* was coded as 2. Those that identified as transgender were excluded from the analysis. In the analysis were dummy variables were needed, *female* was coded as 0 and *male* was coded as 1.
- **Year in school:** Participants were asked their year in school and were given the options of *1st year undergraduate*, *2nd year undergraduate*, *3rd year undergraduate*, *4th year undergraduate*, *5th year or more undergraduate*, *graduate or professional*, *not seeking a degree* and *other*. *1st year undergraduate* was coded as 1; *2nd year undergraduate* was coded as 2; *3rd year undergraduate* was coded as 3; *4th year undergraduate* was coded at 4; *5th year or more undergraduate* was coded as 5; *graduate or professional* was coded as 6; *not seeking a degree*; and *other* was coded as 7.
- **Race/Ethnicity:** For this question participants were asked, “how do you usually describe yourself?” Participants were given the following options: *White*, *Black or African American*, *Hispanic or Latino/a*, *Asian or Pacific Islander*, *American Indian*, *Alaskan Native*, *or Native Hawaiian*, *Biracial or Multiracial*, and *Other*. *White* was coded as 1;

Black or African American was coded as 2; *Hispanic or Latino/a* was coded as 3; *Asian or Pacific Islander* was coded as 4; *American Indian, Alaskan native, or Native Hawaiian* was coded as 5; *Biracial or Multiracial* was coded as 6; and *Other* was coded as 7.

- **Number of Sexual Partners:** Participants were asked the number of partners they have had oral sex, vaginal intercourse, or anal intercourse with within the last 12 months. This was also a scale variable that allowed students to enter a number ranging from 0-99 representing the total number of partners. For the purposes of this study participants who reported more than 20 sexual partners were excluded.
- **Type of Sexual Interaction:** Participants were asked within the last 30 days if they have had oral sex, vaginal intercourse, and/or anal intercourse. Response options for this question were *No, have never done this sexual activity*; *No, have done this sexual activity in the past but not in the last 30 days*; and *Yes. No, have never done this sexual activity* was coded as 1; *No, have done this sexual activity in the past but not in the last 30 days* was coded as 2; and *Yes* was coded as 3. Similar to the questions regarding the gender of sexual partners, this question will also be broken down into three separate variables. The responses have also been recoded so that *No, have done this sexual activity in the past but not in the last 30 days* and *Yes* will be combined as *Yes* and coded as 2 and *No* will remain coded as 1. The new variables and coded responses are as follows:
 - **Oral Sex:** *No* was coded as 1 and *Yes* was coded as 2
 - **Vaginal Intercourse:** *No* was coded as 1 and *Yes* was coded as 2
 - **Anal Intercourse:** *No* was coded as 1 and *Yes* was coded as 2
- **Condom/Protective Barrier Use:** Participants were asked within the last 30 days how often they or their partner(s) used a condom or other protective barrier during oral sex,

vaginal intercourse and anal intercourse. The response options were *N/A, never did this sexual activity, Have not done this sexual activity during the last 30 days, Never, Rarely, Sometimes, Most of the time, and Always*. *N/A, never did this sexual activity* was coded as 1; *Have not done this sexual activity during the last 30 days* was coded as 2; *Never* was coded as 3; *Rarely* was coded as 4; *Sometimes* was coded as 5; *Most of the time* was coded as 6; and *Always* was coded as 7. This question was separated into three variables. The responses were also recoded. *N/A, never did this sexual activity, Have not done this sexual activity during the last 30 days,* and *Never* remained the same coded as 1, 2, and 3, respectively. *Rarely* and *Sometimes* were recoded as 4 and *Most of the time* and *Always* were coded as 5. The new variables and coded responses are as follows:

- **Oral Sex_Protection:** *N/A, never did this sexual activity* was coded as 1; *Have not done this sexual activity during the last 30 days* was coded as 2; *Never* was coded as 3; *Rarely* and *Sometimes* were coded as 4; and *Most of the time* and *Always* were coded as 5
- **Vaginal Intercourse_Protection:** *N/A, never did this sexual activity* was coded as 1; *Have not done this sexual activity during the last 30 days* was coded as 2; *Never* was coded as 3; *Rarely* and *Sometimes* were coded as 4; and *Most of the time* and *Always* were coded as 5
- **Anal Intercourse_Protection:** *N/A, never did this sexual activity* was coded as 1; *Have not done this sexual activity during the last 30 days* was coded as 2; *Never* was coded as 3; *Rarely* and *Sometimes* were coded as 4; and *Most of the time* and *Always* were coded as 5

- **Sexually Transmitted Disease Status:** Respondents were asked with in the last 12 months, have they been diagnosed or treated by a professional for any of the following. Participants were provided with 26 options and were able to respond either yes or no. For the purpose of this study responses were only analyzed using the responses to the provided sexually transmitted diseases. Those were chlamydia, genital herpes, genital warts/Human Papillomavirus (HPV), gonorrhea and Human Immunodeficiency Virus (HIV). If a student selected no then the response was recorded as *No* and coded as 1. If students responded yes then the response was recorded as *Yes* and coded as 2. This question was also separated to list each sexually transmitted disease as a different variable. The coding remained the same, *No* was 1 and *Yes* was 2. Below are the variables:

- **Chlamydia**
- **Genital herpes**
- **Genital warts/Human Papillomavirus (HPV)**
- **Gonorrhea**
- **Human Immunodeficiency Virus (HIV)**

An additional variable on sexually transmitted disease status was also generated using the aforementioned variables. The five variables were combined to create one variable that identified whether or not a student had been diagnosed with a sexually transmitted disease in general. The coding is the same as the separate sexually transmitted disease variables, *No* was 1 and *Yes* was 2. This new variable was titled **STD_status**.

- **Approximate GPA:** Participants were asked to provide their grade point average and were given five response options: *A*, *B*, *C*, *D/F*, *N/A*. *A* was coded as 1; *B* was coded as 2;

C was coded as 3 and D/F was coded as 4. For the purpose of this study students reporting N/A as their grade point average were excluded.

3.6 DATA ANALYSIS

Various methods of analyses will be used to interpret the data. Descriptive statistics will be performed to determine the demographics of the population. These will involve using the age, gender, sexual orientation, year in school, and race/ethnicity variables. These numbers will provide a general idea of the sampled population.

To address the first set of research questions multiple forms of statistical analyses will be performed. In question Ia the relationship between academic performance and multiple sexual partners is analyzed. For this question the *approximate GPA* and *number of sexual partners* variables will be examined using a one-way analysis of variance (ANOVA). The independent variable will be *approximate GPA* and the dependent variable will be the *number of sexual partners* variable. This form of analysis will compare means between the approximate GPA groups to establish if differences in the number of sexual partners existed. The data is presented as mean \pm standard deviation. Additional analyses will be used to determine if there is a relationship between gender, academic performance and multiple sexual partners. A two-way ANOVA will be performed and the independent variables are *gender* and *approximate GPA* and the dependent variable is *number of sexual partners*.

To address questions Ib, Ic, IIa, IIb, IIc, IID and IIe chi-square analyses will be performed to determine the correlation between the variables. In Ib, the relationship between academic performance and anal intercourse is analyzed. The *approximate GPA* variable and *anal intercourse* variables are examined. The independent variable is *academic performance* and the

dependent variable is *anal intercourse* variable. Question Ic examines the relationship between academic performance and inconsistent condom use. The *approximate GPA* variable and condom/protective barrier usage variables are analyzed. The independent variable is *approximate GPA* and the dependent variables are *oral sex_protection*, *vaginal intercourse_protection* and *anal intercourse_protection*. For questions IIa, IIb, IIc, IId, and IIe the relationship between select sexually transmitted diseases (*gonorrhea*, *chlamydia*, *herpes*, *human papillomavirus/warts (HPV)* and *HIV*, respectively) and *approximate GPA* is examined. The chi-square analysis will be used to look at the differences of each dependent variable across the different grade point averages.

To address question III, the relationship between academic performance, risky sexual behaviors and sexually transmitted disease diagnosis/treatment, various form of analysis will be completed. For question IIIa a two-way ANOVA will be used to examine the relationship between grade point average and sexually transmitted diseases on the number of sexual partners to determine if an interaction exists. The independent variables are *approximate GPA* and *STD_status* and the dependent variable is *number of sexual partners*. Question IIIb and IIIc will be analyzed using a binomial logistic regression to ascertain the effects of grade point averages and sexually transmitted diseases on anal intercourse and grade point averages and sexually transmitted diseases on condom use while engaging in vaginal intercourse. *Approximate GPA* and *STD_status* are the independent variables in each analysis and anal intercourse and *vaginal intercourse_protection* are the dependent variables, respectively.

3.6.1 Summary

A summary of the research questions and analysis methods used is presented in Table

3.2.

Table 3.2

Summary of Research Questions and Analysis Procedures

Research Question	Analysis Methods
1. What is the relationship between academic performance and multiple sex partners?	ANOVA Two-way ANOVA (gender)
2. What is the relationship between academic performance and engaging in risky sexual acts, such as anal intercourse?	Chi-Square
3. What is the relationship between academic performance and inconsistent condom usage?	Chi-Square
4. What is the relationship between being diagnosed with gonorrhea and academic performance?	Chi-Square
5. What is the relationship between being diagnosed with chlamydia and academic performance?	Chi-Square
6. What is the relationship between being diagnosed with herpes and academic performance?	Chi-Square
7. What is the relationship between being diagnosed with human papillomavirus (HPV)/warts?	Chi-Square
8. What is the relationship between being diagnosed with HIV and academic performance?	Chi-Square
9. What is the relationship between academic performance, the number of sexual partners and sexually transmitted disease diagnosis/treatment	Two-way ANOVA
10. What is the relationship between academic performance, anal intercourse and sexually transmitted disease diagnosis/treatment	Binomial Logistic Regression
11. What is the relationship between academic performance, condom use and sexually transmitted disease diagnosis/treatment	Binomial Logistic Regression

CHAPTER 4

RESULTS

The purpose of this study was to explore three relationships. The first was to examine the relationship between academic performance and risky sexual behaviors (e.g. multiple sexual partners, condom use and anal intercourse). Secondly, the study will seek to gain better insight on the relationship between sexually transmitted disease diagnosis/treatment and academic performance among college students within the United States. In addition, the relationship between academic performance, risky sexual behaviors and sexually transmitted disease diagnosis/treatment will be analyzed. This chapter presents the results of the study.

Research Questions

- I. What is the relationship between academic performance and risky sexual behavior among students within a university setting?
 - a. What is the relationship between academic performance and number of sexual partners?
 - b. What is the relationship between academic performance and engaging anal intercourse?
 - c. What is the relationship between academic performance and condom use?
- II. What is the relationship between sexually transmitted diseases (STDs) diagnosis/treatment and academic performance?
 - a. What is the relationship between being diagnosed/treated for gonorrhea and academic performance?
 - b. What is the relationship between being diagnosed/treated for chlamydia and academic performance?

- c. What is the relationship between being diagnosed/treated for herpes and academic performance?
 - d. What is the relationship between being diagnosed/treated for the human papillomavirus/warts (HPV) and academic performance?
 - e. What is the relationship between being diagnosed/treated for HIV/AIDS and academic performance?
- III. What is the relationship between academic performance, risky sexual behaviors and sexually transmitted diseases (STDs) diagnosis/treatment?
- a. What is the relationship between academic performance, number of sexual partners and the diagnosis/treatment of sexually transmitted diseases?
 - b. What is the relationship between academic performance, anal intercourse and the diagnosis/treatment of sexually transmitted diseases?
 - c. What is the relationship between academic performance, condom use and the diagnosis/treatment of sexually transmitted diseases?

4.1 DESCRIPTIVE STATISTICS

All participants were students enrolled in a post-secondary institution of higher learning in the United States. Each participant completed the National College Health Assessment-II in the Fall of 2010 at their respective institution. After excluding those younger than 18 and older than 24, those who responded that they were *married/partnered, divorced, separated* or *other*, reported more than 20 sexual partners, reported their approximate GPA as N/A and identified as *transgender*, the final sampled population for this study was 21,264 participants. I have chosen to study only those aged 18-24 years because this is the traditional college student age range.

Those who identified as married/partnered, divorced, separated or other were excluded because people in these types of relationships are less likely to engage in risky behavior and have monogamous relationships. Also within the confines of a marriage the behaviors being viewed as risky are not identified as such. Those who reported 20 or more partners and identified as transgender were excluded because the number of participants was not great enough to produce reliable results. Students who reported a grade point average of N/A were also excluded because these students did not have a GPA. Various reasons for this is that many of the students were freshman and transfer students that had not completed a semester at the particular institution at the time of the survey. Females represented the majority of the population (65.8%) and 96.4% of the participants were undergraduate students. Sixty-eight percent were White-non Hispanic, and 94.0% of the students identified themselves as heterosexual. Table 4.1 summarizes the demographics of the survey.

Table 4.1

Characteristics of the Participants in the study

	Fall 2010 ACHA-NCHA II Reference Group (<i>n</i> = 30,093)	Study Participants (<i>n</i> = 21,264)
Gender ¹		
Male	34.2%	34.2%
Female	63.2%	65.8%
Year in School ²		
1 st year undergraduate	34.1%	34.6%
2 nd year undergraduate	19.7%	22.7%
3 rd year undergraduate	19.3%	21.7%
4 th year undergraduate	12.3%	13.7%
5 th year undergraduate or more	4.4%	3.8%
Graduate/Professional	9.3%	3.4%
Race/Ethnicity ³		
White/Caucasian American	64.6%	68.1%
Black/African American	8.1%	7.8%
Hispanic/Latino	10.0%	9.9%
Asian or Pacific Islander	14.8%	14.6%
American Indian or Alaskan	2.3%	2.1%
Biracial or Multiracial	3.8%	3.8%
Other	2.7%	2.4%
Mean age ± SD	21.4 ± 5.55	19.67 ± 1.59

¹ percentage does not add up to 100 % because “transgender” category was excluded

² percentage does not add up to 100% because the “not seeking a degree” and “other” categories were excluded

³ percentage adds up to more than 100% because multiple responses were possible

4.2 RESEARCH QUESTION I: ACADEMIC PERFORMANCE AND RISKY SEXUAL BEHAVIOR

4.2.1 Academic Performance and Multiple Sexual Partners

A one-way analysis of variance (ANOVA) was used to answer research question Ia by determining if the mean number of sexual partners differed among approximate grade point average groups. Before conducting the ANOVA, the sample population was analyzed to account for the assumptions of a one-way ANOVA (i.e. normally distributed data and homogeneous variances). Outliers were present, as assessed by boxplot, but after running the same test without the outliers it was determined that removing the outliers would not affect the outcome. As determined by the Shapiro-Wilk test ($p > .05$), the data were not normally distributed for each

group but since the sample sizes are large and the distributions are fairly and similarly skewed, non-normality will most likely not be an issue (Sawilowsky & Blair, 1992). A one-way analysis of variance (ANOVA) at the .05 level was performed to analyze the interactions between the dependent variable *number of sexual partners* and the independent variable *approximate GPA*. The null hypothesis stated that the means were equal (i.e. $H_0: \mu_A = \mu_B = \mu_C = \mu_{D/F} = \mu_{N/A}$). The results of the ANOVA are displayed in Table 4.2.

Table 4.2

ANOVA of Multiple Sexual Partners when Grouped by Approximate GPA

Source	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	Sig.
Between groups	1046.045	3	348.682	94.447	<.001
Within Groups	78488.153	21260	3.692		
Total	79534.198	21263			

P <.05 level of significance

Since the assumption of homogeneity of variances was violated, the results of the Welch ANOVA are presented in Table 4.3. For this analysis the results signified that there were statistically significant differences somewhere among the sample means of the number of sexual partners, $p < .001$.

Table 4.3

Welch ANOVA of Multiple Sexual Partners when Grouped by Approximate GPA

	Statistic	<i>df1</i>	<i>df2</i>	Sig.
Welch	94.769	3	836.224	<.001

P <.05 level of significance

The number of sexual partners appears to be related to approximate grade point averages $p < .001$. A post hoc multiple comparison test was run to determine individual differences within the groups. The Games-Howell option on the one-way ANOVA was used to make multiple comparisons on the relevant grade point averages. Table 4.4 displays the results of the post hoc Games-Howell analysis at the .05 alpha level.

There was a statistically significant mean difference between the grade point average and number of sexual partners for four comparisons. Those students with an A grade point average had approximately .35 fewer sexual partners ($M = 1.05$, $SD = 1.592$) than those students with a B ($M = 1.40$, $SD = 2.001$), at a 95% CI of .41 to .28, $p < .001$, .67 fewer sexual partners ($M = 1.72$, $SD = 2.365$), than those with a C at a 95% CI of .79 to .54, $p < .001$, and .58 fewer sexual partners ($M = 1.63$, $SD = 2.362$) than those with a D/F at a 95% CI of 1.04 to .12, $p = .008$. Those students with B grade point average had approximately .32 fewer sexual partners than those students with a C at a 95% CI of .45 to .19, $p < .001$. Figure 4.1 summarizes the result of the means comparison of the number of sexual partners and approximate grade point averages.

Table 4.4

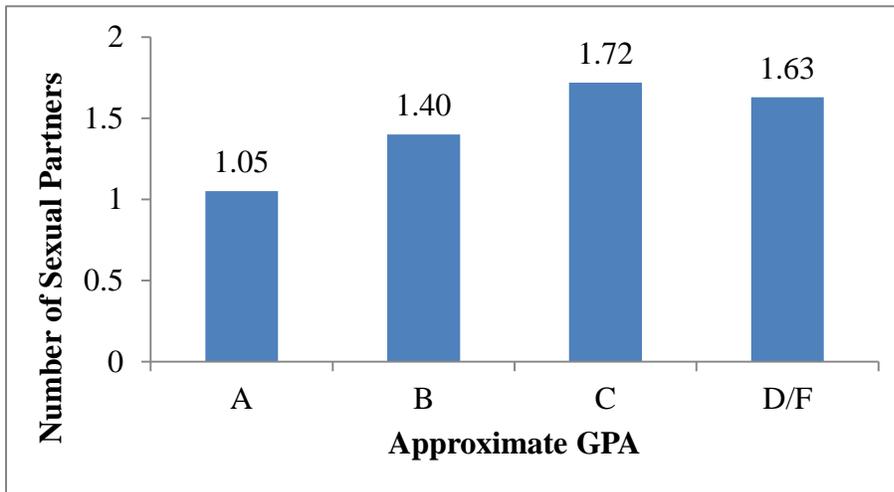
Games-Howell Post Hoc Analysis: Number of Sexual Partners and Approximate GPA

Approximate GPA		Mean Difference	SE	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
A	B	-.347	.027	<.001	-.41	-.28
	C	-.666	.049	<.001	-.79	-.54
	D/F	-.577	.178	.008	-1.04	-.12
B	A	.347	.027	<.001	.28	.41
	C	-.320	.050	<.001	-.45	-.19
	D/F	-.230	.178	.568	-.69	.23
C	A	.666	.049	<.001	.54	.79
	B	.320	.050	<.001	.19	.45
	D/F	.089	.183	.962	-.38	.56
D/F	A	.577	.178	.008	.12	1.04
	B	.230	.178	.568	-.23	.69
	C	-.089	.183	.962	-.56	.38

P < .05 level of significance

Figure 4.1

Means Comparison of Number of Sexual Partners and Approximate GPA



A two-way analysis of variance (ANOVA) was used to determine if there is an interaction between *approximate GPA* and *gender* on *multiple sexual partners*. The analysis will be used to show how *approximate GPA* and *gender* interact to predict the number of sexual partners. Put another way, is the effect of grade point averages on multiple sex partners different for males and females. Similar to the previous statistical analysis, outliers were present, as assessed by boxplot, but after running the same test without the outliers it was determined that removing the outliers would not affect the outcome. As determined by the Shapiro-Wilk test ($p > .05$), the data were not normally distributed for each group but since the sample sizes are large and the distributions are fairly and similarly skewed, non-normality will most likely not be an issue (Sawilowsky & Blair, 1992).

A two-way analysis of variance (ANOVA) at a .05 alpha level was performed to analyze the interaction between the independent variables *approximate GPA* and *gender*, on the dependent variable *multiple sexual partners*. For this form of analysis there are three hypotheses. The first hypothesis states that there is not a difference in the number of sexual partners among

students with various approximate grade point averages (i.e. $H_0: \mu_A = \mu_B = \mu_C = \mu_{D/F} = \mu_{N/A}$). This hypothesis was tested in the first analysis in which I rejected the null hypothesis and concluded that the number of sexual partners appears to be related to approximate grade point averages. The second hypothesis states that there is not a difference in the number of sexual partners between male and female students (i.e. $H_0: \mu_{\text{male}} = \mu_{\text{female}}$) and the third hypothesis states that there is not an interaction of gender and approximate GPA on the mean number of sexual partners. The results of the two-way ANOVA are displayed in Table 4.5.

Table 4.5

Two-Way ANOVA of Approximate GPA, Gender and Number of Sexual Partners

Source of Variation	SS	df	MS	F	Sig.
Gender	63.039	1	63.039	17.128	<.001
Approximate GPA	951.134	3	317.045	86.143	<.001
Gender x Approximate GPA	10.335	3	3.445	.936	.422
Error	78232.005	21256	3.680		
Total	116433.000	21264			

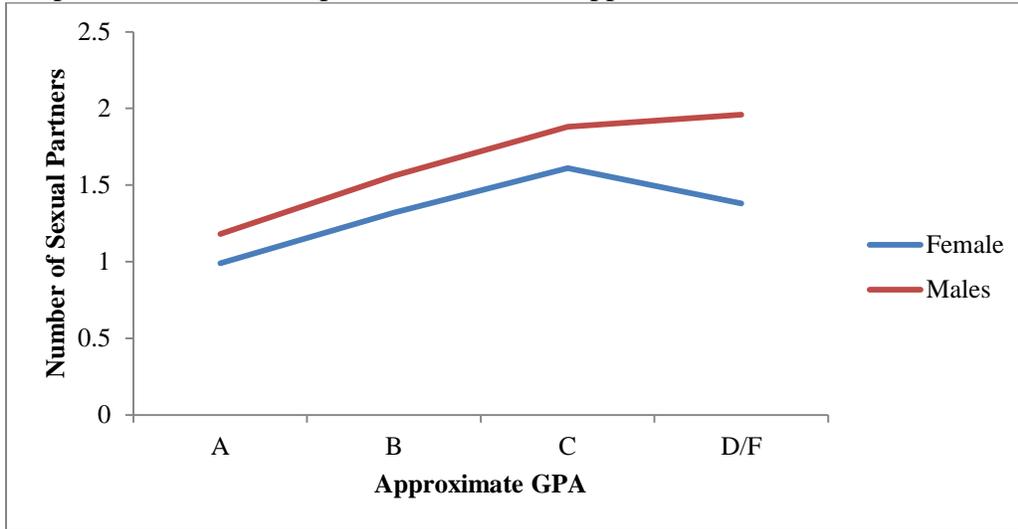
P < .05 level of significance

For the second hypothesis that stated that there is not a difference in the number of sexual partners between male and female students, I rejected the null hypothesis and concluded that the number of sexual partners is related to gender. There was a statistically significant difference between males and females for the number of sexual partners, $F(1, 21256) = 17.128, p < .001$.

The third hypothesis stated that there is not an interaction of gender and approximate GPA on the mean number of sexual partners, $F(1, 21256) = .936, p = .422$. I failed to reject the null hypothesis and concluded that there is not an interaction of gender and approximate GPA on the mean number of sexual partners. Results are shown in Figure 4.2.

Figure: 4.2

Graph of the Relationship between Gender, Approximate GPA and Number of Sexual Partners



4.2.2 Academic Performance and Anal Intercourse

A chi square analysis was used to analyze the relationship between *approximate GPA* and *anal intercourse* and to determine if there was an association between the two variables. The chi-square statistic was used to investigate whether or not each approximate grade point average category is associated with anal intercourse. Before running the analysis, the assumption of independence and sample size were met. There is one observation per respondent and 0% of the contingency cells had an expected value of less than five. There was a statistically significant association between approximate GPA and anal intercourse, $\chi^2(3) = 117.269, p < .001$. The results are presented in Table 4.6. The results showed that those who reported an A grade point average were less likely to engage in anal intercourse than those who reported lower grade point averages. Of those students who reported approximate grade point averages of an A, 14.4% have engaged in anal intercourse in contrast to those who reported an approximate grade point average of a B (18.6%), C (23.0%), or D/F (23.2%).

Table 4.6

Chi Square of Approximate GPA and Anal Intercourse

Independent Variable	Anal Intercourse		Sig.
	Yes N (%)	No N (%)	
Approximate GPA			<.001
A	1,076 (14.4)	6,408 (85.6)	
B	2,004 (18.6)	8,763 (81.4)	
C	599 (23.0)	2,002 (77.0)	
D/F	41 (23.2)	136 (76.8)	

P < .05 level of significance

4.2.3 Academic Performance and Inconsistent Condom Use

Chi square analysis was used to determine if there was a relationship between approximate GPA and inconsistent condom use while engaging in oral sex, vaginal intercourse and anal intercourse. Before running the analysis, the assumption of independence and sample size were met. There is one observation per respondent in each analysis. Approximate GPA and condom use while engaging in oral sex had 20% of the contingency cells with an expected value of less than 5. Vaginal intercourse had 0.0% of the contingency cells with an expected value less than 5. For approximate GPA and condom use while engaging in anal intercourse, 15% of the contingency cells had an expected value less than 5. There was a statistically significant association between approximate GPA and condom use while engaging in oral sex, $\chi^2(12) = 34.475$, $p = .001$ and between approximate GPA and condom use while engaging in vaginal intercourse, $\chi^2(12) = 33.794$, $p = .001$. The results showed that, generally within approximate GPA, as the reported grade point average declined, the percentage of condom use during oral sex, “most of the time” or “always” increased and the percentage of condom use during vaginal intercourse “most of the time” or “always” decreased. Results are summarized in Table 4.7.

Students who reported an approximate grade point average of an A and stated that they engaged in oral sex in the last 30 days, reported using a condom “most of the time” or “always”

4.5% of the time in contrast to those who reported a grade point average B (6.2%), a C (8.0%) and a D/F (7.2%). The opposite trend was seen with approximate GPAs reported in relation to condom use during vaginal intercourse, in the last 30 days. The percentage of condom use “most of the time” or “always” decreased as approximate grade point average declined. Those who reported a grade point average of an A had the highest condom usage among those who engaged in vaginal intercourse with 62.9%. Those who reported grade point averages of B, C or D/F reported a condom use levels of “most of the time” or “always” 60.6%, 57.6%, and 51.7% respectively. Results are displayed in Figure 4.3.

Table 4.7

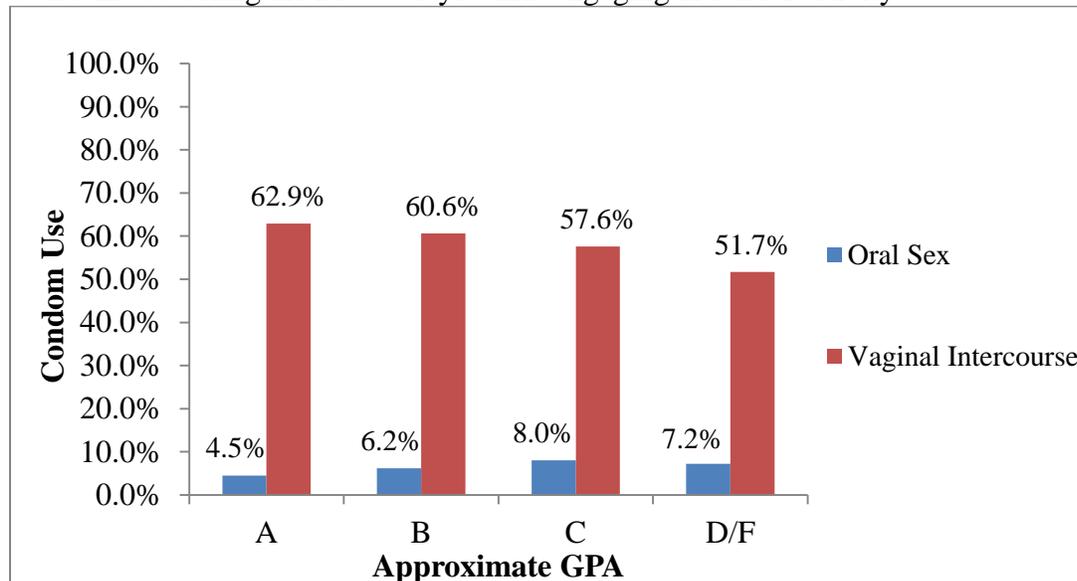
Chi Square of Approximate GPA and Condom Use

Condom Use	χ^2	<i>p</i> Value	<i>n</i>
Oral Sex Protection	34.475	.001	9,232
Vaginal Intercourse Protection	33.794	.001	9,250
Anal Intercourse Protection	6.111	.910	1,784

P < .05 level of significance

Figure 4.3

Condom use during the last 30 days while engaging in sexual activity



*Only statistically significant results are presented

4.2.4 Summary of the Relationship between Academic Performance and Risky Sexual Behaviors

Generally there was an inverse relationship between approximate GPA and the number of sexual partners that students reported. On average, students who achieve higher grade point averages were less likely to have multiple sexual partners than those with lower grade point averages. As grade point averages continued to decrease, the number of sexual partners increased. There was also a difference in gender in regards to the number of sexual partners that students reported. Overall, males had more sexual partners than females. When studying the effect that approximate grade point average and gender has on the number of sexual partners the results revealed that the effect of grade point averages on the number of sexual partners is not different for males and females.

Grade point average was also generally related to anal intercourse and condom use among students. Students who reported higher grade point averages tended to engage in anal intercourse less frequently than those with lower grade point averages. The results also revealed that there is a relationship between condom use when engaging in oral sex and vaginal intercourse. Students who reported lower grade point averages used condoms during oral sex at a higher rate than those reporting higher grade point averages. However, the opposite was seen when looking at condom use in relation to vaginal intercourse, as grade point averages declined so did the use of condoms.

4.3 RESEARCH QUESTION II: SEXUALLY TRANSMITTED DISEASE DIAGNOSIS/TREATMENT AND ACADEMIC PERFORMANCE

4.3.1 Sexually Transmitted Disease Diagnosis/Treatment and Academic Performance

Chi square analysis was used to determine if there was a relationship between various sexually transmitted disease diagnoses/treatment (gonorrhea, chlamydia, herpes, human papillomavirus (HPV)/warts, and HIV/AIDS) and academic performance. Before running the analysis, the assumption of independence and sample size were met. There is one observation per respondent in each analysis. Approximate GPA and gonorrhea had 12.5% of the contingency cells with an expected value of less than 5. The same percentage was also seen in the relationships between approximate GPA and chlamydia, approximate GPA and herpes, approximate GPA and the human papillomavirus (HPV)/warts, and approximate GPA and HIV. There was a statistically significant association between gonorrhea and academic performance, $\chi^2(3) = 10.796, p = .013$, chlamydia and academic performance, $\chi^2(4) = 67.433, p < .001$, and HIV and academic performance, $\chi^2(3) = 10.043, p = .018$. The results showed that, generally within approximate GPA category, the percentage of students who reported being diagnosed with gonorrhea, chlamydia, and/or HIV increased as approximate grade point average declined. Results are summarized in Table 4.8.

Of those students who reported an approximate GPA of an A, 0.3% were diagnosed/treated for gonorrhea within the last twelve months in contrast to students who reported a B (0.3%), a C (0.7%) or a D/F (.6%). A similar trend was seen with those who stated they were diagnosed/treated for chlamydia within the last twelve months. Those who reported a grade point average of an A had the fewest percentage of students diagnosed/treated for chlamydia at .7%. Those who reported grade point averages of B, C or D/F reported

diagnosis/treatment at rates of 1.1%, 2.3% and 4.5% respectively. Students who reported a diagnosis/treatment of HIV revealed similar results as those of gonorrhea and chlamydia.

Students who reported an approximate grade point average of an A were diagnosed/treated for HIV at a rate of .2%. Those students who reported a B, C or D/F had rates of .3%, .6%, and 0% respectively. Results are displayed in Figure 4.4.

Table 4.8

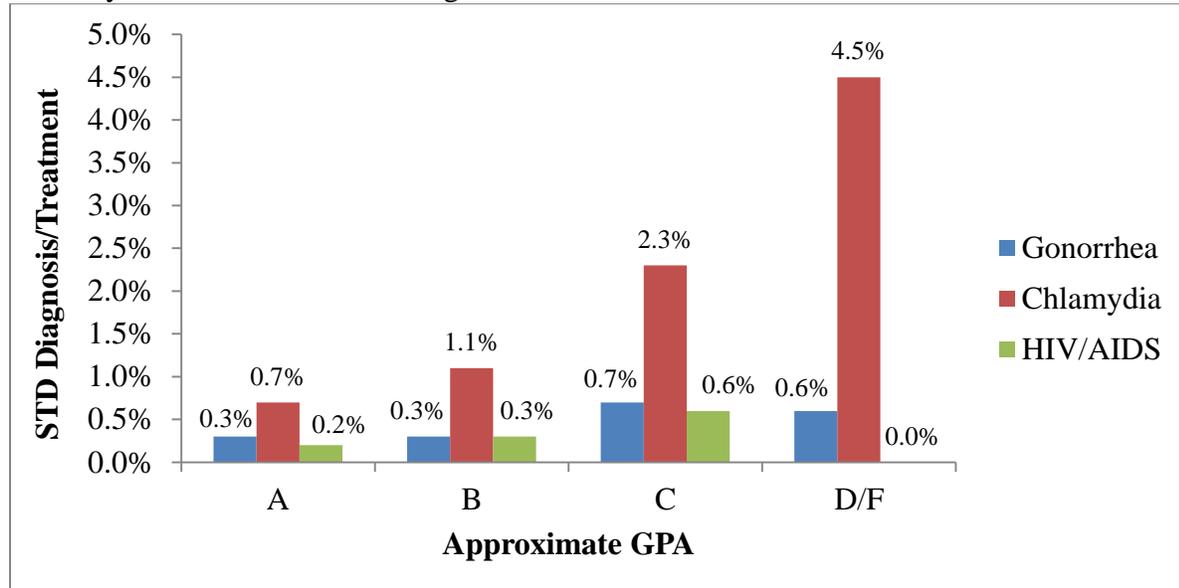
Chi Square of Approximate GPA and Sexually Transmitted Diseases Status

STD Diagnosis/Treatment	χ^2	<i>p</i> Value	<i>n</i> (positive status)
Gonorrhea	10.796	.013	74
Chlamydia	67.433	<.001	231
Herpes	4.256	.235	110
Human Papillomavirus (HPV)/Warts	4.546	.208	261
HIV/AIDS	10.043	.018	60

P <.05 level of significance

Figure 4.4

Sexually Transmitted Disease Diagnosis/Treatment Over the Last 12 Months



*Only statistically significant results are presented

4.3.2 Summary of the Relationship between Sexually Transmitted Disease Diagnosis/Treatment and Academic Performance

The data revealed that sexually transmitted disease diagnosis/treatment and approximate grade point averages are correlated. Within each approximate grade point average Gonorrhea, chlamydia and HIV diagnosis/treatment were more prevalent in students with lower grade point averages as opposed to those who reported higher grades. There did not seem to be a significant effect on grade point averages when diagnosed/treated for herpes and human papillomavirus (HPV)/warts.

4.4 RESEARCH QUESTION III: ACADEMIC PERFORMANCE, SEXUALLY TRANSMITTED DISEASE DIAGNOSIS/TREATMENT AND RISKY SEXUAL BEHAVIOR

4.4.1 Academic Performance, Sexually Transmitted Disease Diagnosis/Treatment and Multiple Sexual Partners

A two-way analysis of variance (ANOVA) was performed to determine if there is an interaction between *approximate GPA* and *STD status on multiple sex partners*. The analysis will be used to determine how *approximate GPA* and *STD status* may interact to predict the number of sexual partners a student may have. The goal is to examine if the effect of grade point averages on multiple sexual partners differs between those who are and are not diagnosed/treated for a sexually transmitted disease. Similar to the previously run two-way ANOVA, outliers were present, as assessed by boxplot, but after running the same test without the outliers it was determined that removing the outliers would not affect the outcome. As determined by the Shapiro-Wilk test ($p > .05$), the data were not normally distributed for each group but since the

sample sizes are large and the distributions are fairly and similarly skewed, non-normality will most likely not be an issue (Sawilowsky & Blair, 1992).

A two-way analysis of variance (ANOVA) at a .05 level was performed to analyze the interaction between the independent variables *approximate GPA* and *STD_status*, on the dependent variable *multiple sexual partners*. The three hypotheses for this analysis are: there is not a difference in the number of sexual partners among students with various approximate grade point averages (i.e. $H_0: \mu_A = \mu_B = \mu_C = \mu_{D/F} = \mu_{N/A}$); there is not a difference in the number of sexual partners between students diagnosed/treated for sexually transmitted disease and those that were not diagnosed/treated for sexually transmitted diseases (i.e. $H_0: \mu_{STD_{yes}} = \mu_{STD_{no}}$); and there is no interaction of approximate GPA and STD status on the mean number of sexual partners. The results of the two-way ANOVA are displayed in Table 4.9.

Table 4.9

Two-Way ANOVA of Sexually Transmitted Disease Status, Approximate GPA and Number of Sexual Partners

Source of Variation	SS	df	MS	F	Sig.
STD status	313.017	1	313.017	87.718	<.001
Approximate GPA	98.505	3	32.835	9.201	<.001
STD status x Approximate GPA	1.051	3	.350	.098	.961
Error	74784.256	20957	3.568		
Total	113173.000	20964			

P < .05 level of significance

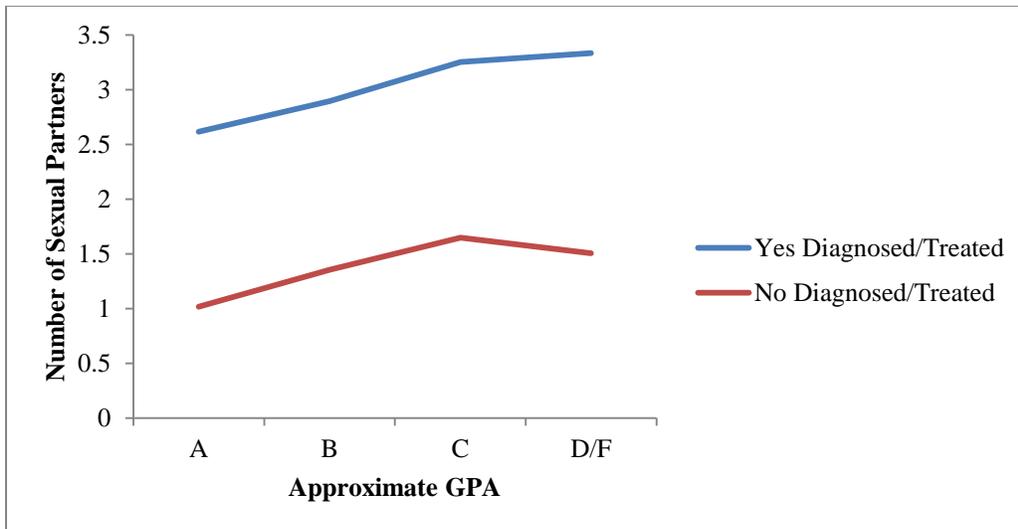
The first hypothesis stated that there is not a difference in the number of sexual partners among students with various approximate grade point averages. This hypothesis was tested in the first analysis in which I rejected the null hypothesis and concluded that the number of sexual partners appears to be related to approximate grade point averages. For the second hypothesis that stated that there is not a difference in the number of sexual partners between students who were and were not diagnosed/treated for sexually transmitted diseases, I rejected the null hypothesis and concluded that the number of sexual partners is related to sexually transmitted

disease status. There was a statistically significant difference in the number of sexual partners between students who were and were not diagnosed/treated for STDs, $F(1, 20957) = 87.718, p < .001$. For the third hypothesis that stated there is not an interaction of sexually transmitted disease status and approximate grade point average on the mean number of sexual partners, there was not a statistically significant interaction and I failed to reject the null hypothesis and concluded that there is not an interaction of sexually transmitted disease status and approximate grade point average on the mean number of sexual partners, $F(1, 22731) = .098, p = .961$.

Results are presented in Figure 4.5.

Figure 4.5

Graph of the Relationship between STD Status, Approximate GPA and Number of Sexual Partners



4.4.2 Academic Performance, Sexually Transmitted Disease Diagnosis/Treatment and Anal Intercourse

A binomial logistic regression was performed to ascertain the effects of *approximate GPA* and *STD status* on *anal intercourse*. The following assumptions were met prior to running the analysis: independence of cases/errors, no multicollinearity, no significant outliers or influential points, categories are mutually exclusive and exhaustive. The binomial logistic

regression model was statistically significant, $\chi^2(3) = 98.178, p < .001$. Of the predictive variables, all were statistically significant. Results are shown in Table 4.10.

Students with grade point averages of B were 1.34 times more likely to engage in anal intercourse at a 95% CI of 1.24 to 1.45, students with a C grade point average were 1.72 times more likely to engage in anal intercourse at a 95% CI of 1.53 to 1.92 and those students who reported a grade point average of D/F were 1.64 times more likely to use condoms while engaging in vaginal intercourse at a 95% CI of 1.14 to 2.36 than those students who reported a grade point average of an A. Results also showed that students diagnosed/treated for a sexually transmitted disease within the last twelve months were 3.52 times more likely to use a condom during vaginal intercourse at a 95% CI of 2.95 to 4.21 than those who were not diagnosed/treated for a sexually transmitted disease.

Table 4.10

Summary of Binomial Logistic Regression Analysis for Academic Performance, Sexually Transmitted Diseases and Anal Intercourse

Predictor	<i>B</i>	<i>SE</i>	Sig	<i>e^B</i>
Approximate GPA (A)			<.001	
B	.293	.042	<.001	1.340
C	.540	.058	<.001	1.716
D/F	.494	.187	.008	1.639
STD	1.260	.091	<.001	3.524
Constant	-1.819	.033	<.001	.162

P < .05 level of significance

4.4.3 Academic Performance, Sexually Transmitted Disease Diagnosis/Treatment and Condom Use

A binomial logistic regression was performed to ascertain the effects of academic performance and sexually transmitted disease diagnosis/treatment on the likelihood that students use condoms during vaginal intercourse. The following assumptions were met prior to running the analysis: independence of cases/errors, no multicollinearity, no significant outliers or

influential points, categories are mutually exclusive and exhaustive. The binomial logistic regression model was statically significant, $\chi^2(3) = 145.735, p <.001$. All predictive variables were statistically significant as shown in Table 4.11. Students with grade point averages of B were 1.40 times more likely to use condoms while engaging in vaginal intercourse at a 95% CI of 1.31 to 1.49, students with a C grade point average were 1.60 times more likely to use condoms during vaginal intercourse at a 95% CI of 1.46 to 1.76 and those students who reported a grade point average of D/F were 1.55 times more likely to use condoms while engaging in vaginal intercourse at a 95% CI of 1.14 to 2.10 than those students who reported a grade point average of an A. Results also showed that students diagnosed/treated for a sexually transmitted disease within the last twelve months were 2.21 times more likely to use a condom during vaginal intercourse at a 95% CI of 1.85 to 2.64 than those who were not diagnosed/treated for a sexually transmitted disease.

Table 4.11

Summary of Binomial Logistic Regression Analysis for Academic Performance, Sexually Transmitted Diseases and Condom Use during Vaginal Intercourse

Predictor	<i>B</i>	<i>SE</i>	Sig	<i>e^B</i>
Approximate GPA			<.001	
B	.334	.032	<.001	1.397
C	.472	.048	<.001	1.603
D/F	.436	.157	.005	1.546
STD	.791	.091	<.001	2.206
Constant	-.812	.025	<.001	.444

P <.05 level of significance

4.4.4 Summary of Relationship between Academic Performance, Sexually Transmitted Disease Diagnosis/Treatment and Risky Sexual Behavior

Overall, there is a statistically significant relationship between academic performance, sexually transmitted disease diagnosis/treatment and risky sexual behaviors. Results revealed that there is a relationship between the number of sexually partners and sexually transmitted

disease status. Students who were diagnosed/treated for a sexually transmitted disease reported more sexual partners than those students who were not diagnosed/treated for a sexually transmitted disease. It was also determined that there was not an interaction between grade point averages and sexually transmitted disease status on the number of sexual partners. The effect of approximate grade point averages on the number of sexual partners was not different for those who were diagnosed/treated for sexually transmitted diseases and those that were not diagnosed/treated for sexually transmitted diseases.

The binomial regressions revealed that grade point average and sexually transmitted disease diagnosis/treatment were predictive of engagement in anal intercourse. The odds of students engaging in anal intercourse are increased as grade point averages decrease. The opposite trend was also seen with condom use. The odds of students using condoms during vaginal intercourse are decreased as grade point averages increase.

CHAPTER 5

DISCUSSION

5.1 COMMENTS

The goal in conducting this study was to determine if there was a relationship between academic performance, risky sexual behaviors, and sexually transmitted disease diagnosis/treatment. The hope was that the insight gained could be used to improve the way sexual health is approached on college and university campuses in the United States. While the results are insightful and a step in the right direction, future research is necessary to gain a better understanding of the studied relationships.

I set out to explore the linear and circular relationships among academic performance, risky sexual behaviors and sexually transmitted diseases in college students. I predicted that the three variables formed a circle in which altering one (whether negatively or positively) will have an effect on the others. I felt that it was imperative to examine the logical cycle of the three variables to fully understand their relationship. Based on my results I was able to prove that there are linear and circular relationships between academic performance, risky sexual behaviors and sexually transmitted disease diagnosis/treatment. Throughout the study as I modified each variable, I seen a change in the other variables. The following sections provide a more detailed explanation of the linear and circular relationships.

5.1.1 Findings for Research Question I

The findings of this study in regards to the relationship between academic performance and risky sexual behaviors provided strong support for the hypothesis that grade point averages account for some variance in the number of sexual partners, anal intercourse, and condom use

among college students. Students who reported higher grade point averages generally had fewer sexual partners than those who reported lower grade point averages. Students who reported an A or B grade point average had fewer sexual partners than those who reported all other grades. However, when looking at students who reported a C compared to those who reported a D/F there was not a statistically significant difference in the mean number of sexual partners. One possible explanation is that the students with C grade point averages may have borderline grades and may be close to a D/F grade point average. These students would have similar characteristics to those with D/F GPAs and would have a similar number of sexual partners. In fact, students who reported a C reported more sexual partners than those who reported a D/F (Figure 4.5).

When analyzing the effects of gender on number of sexual partners it was determined that male college students reported more sexual partners than their female counterparts similar to results found in other studies (Durbin et al., 1993; Smith, 1991). However, there was not an interaction between gender and grade point averages on the number of sexual partners. Students (whether male or female) shared the same trend of an increase in the number of partners as grade point average decreased. This is not surprising as both male and female college students tend to have an increased number of sexual partners because of the instability of relationships in this population. While it is not that common for this population to have multiple partners simultaneously, many of the relationships are short in duration with high “turnover” rate and may lead to multiple sequential sexual partners. (Santelli, Brener, Lowry, Bhatt & Zabin, 1998; Siedman, Mosher, & Aral, 1992).

The relationship between academic performance and anal intercourse is a relationship that has not been explored in the literature. These findings mirror the ones presented when analyzing grade point averages and the number of sexual partners. A decrease in grade point

average showed an increase in anal intercourse almost doubling in percentage from those who reported an A compared to those students who reported a B. Students with higher grade point averages appear to avoid engaging in this particular risky sexual act. From this I can infer that there is something about students that are high academic achievers that prevents them from engaging in anal intercourse as often. While studies have continued to show that knowledge regarding STD transmission does not necessarily deter risky sexual behavior (Boyer, Tschann, & Schafer, 1999), the students reporting higher grade point averages may be more inclined to heed this bit of knowledge and act accordingly.

The relationship between grade point averages and condom use brought about interesting results. Students who reported higher grade point averages used condoms during vaginal intercourse at higher rates than those who reported lower grade point averages. However, the complete opposite was seen when examining condom use during oral sex. Students with lower grade point averages used condoms during oral sex at higher rates than their higher grade point average counterparts. Also while the results were not significant, condom use during anal intercourse generally increased as grade point average decreased. This was an unexpected finding. I believe that this can be explained one or two ways. One explanation is that it correlates with the other findings in that students who are engaging in anal intercourse also report lower grade point averages. While I cannot know for sure, I can suggest that this population of students may know the risky behavior they are engaging in and use condoms more frequently during the act to protect themselves. The second explanation is also consistent with the other findings in that those with lower grade point averages also reported higher numbers of sexual partners. Studies have shown significant interrelations between sexual risk behaviors. Multiple sexual partners typically increase frequency of intercourse. Unprotected sexual activities increase as the

number of sexual partners and frequency of intercourse increase. (Capaldi, Stoolmiller, Clark, & Owen, 2002; Kinsey, Pomeroy, & Martin, 1948; Thorton 1990; Smith, 1991). Thus, you would expect to find lower levels of condom use because of the association with higher numbers of sexual partners and increased frequency of intercourse. Both are plausible explanations for the observed results. Further research will need to be conducted to truly understand the intricate relationship between academic performance and condom use during various sexual acts.

5.1.2 Finding for Research Question II

For the second part of the study my observations agreed with my hypothesis that there is a relationship between sexually transmitted disease diagnosis/treatment and academic performance. Other studies analyzing the effects of student health on academic achievement have provided similar results (American College Health Association, 2011; DeBerard, Spielmans & Jukla, 2004; Taras & Potts-Datema, 2005). In the analysis three sexually transmitted diseases displayed a significant relationship with academic performance: gonorrhea, chlamydia and HIV. Students reporting lower grade point averages were more likely to be diagnosed/treated for these three sexually transmitted diseases. The fact that gonorrhea, chlamydia and HIV were statistically significant was not surprising. This is consistent with statistics on the college student population and sexually transmitted disease diagnosis. Gonorrhea and chlamydia are the most commonly diagnosed sexually transmitted diseases in the college student population so to see that those students with positive gonorrhea, chlamydia and HIV diagnosis are more affected academically is not surprising (CDC, 2013). Also with the prescribed treatment necessary for HIV it is also understandable that it would have a greater impact on students' academic success than some other sexually transmitted diseases. While other illnesses such as chlamydia and

gonorrhea can be treated with antibiotics, HIV treatment called highly antiretroviral therapy (HAART) is lifelong and requires strict adherence (Fauci, 1999; Kallings, 2008) and the regimens have the tendencies to be complicated (Bader et al., 2006; Power et al., 2003; Weiss et al., 2006). Highly antiretroviral therapy has also been known to cause undesirable side effects such as nausea and cramps (Cox, 2002; Kallings, 2008). Difficult medication regimens and undesirable side effects may cause students to go to class less frequently and miss assignments and exams which may have a negative impact on their grade point averages.

I also observed no significant relationship between herpes or the human papillomavirus (HPV)/warts and academic performance. This may reflect the infrequent diagnosis in the student population of these sexually transmitted diseases and in particular, the asymptomatic nature of HPV (CDC, 2005). While HPV is the most common sexually transmitted disease its lack of symptoms causes it to go undetected (CDC, 2014).

5.1.3 Findings for Research Question III

For the final research question I hypothesized that I would see a relationship between academic performance, risky sexual behaviors, and sexually transmitted disease diagnosis/treatment. I found that there was a statistically significant relationship between sexually transmitted disease status and number of sexual partners. These results were expected as similar studies have demonstrated that having multiple sexual partners is a risk factor for contracting a sexually transmitted disease. An increase in the number of sexual partners is related to decrease condom use. Both risk factors are related to increase risk in contracting a sexually transmitted disease (Capaldi, Stoolmiller, Clark, & Owen, 2002; MacDonald et al., 1990; Santelli, Brener, Lowry, Bhatt & Zabin, 1998; Staton et al., 1999). I also found that there was no

interaction between grade point average and STD status on the mean number of sexual partners. The lack of interaction was not surprising being that sexually transmitted disease status is highly correlated to the number of sexual partners. So you would expect to see lower numbers of sexual partners across all approximate GPA categories for students that were not diagnosed/treated for a sexually transmitted disease in comparison to the higher number of sexual partners you expect to see in those students who were positively diagnosed/treated for an illness within all grade point averages.

The relationship between grade point average, sexually transmitted diseases diagnosis/treatment and anal intercourse returned significant results. It was determined that lower grade point averages and positive sexually transmitted disease status are predictive factors in the engagement of anal intercourse. Those students with lower grade point averages appeared to engage in anal intercourse at a higher frequency than those with higher grade point averages. The same was also seen with students who were diagnosed/treated for sexually transmitted diseases. Students with a positive STD status were three times as likely as those that have not been diagnosed or treated for a STD to engage in anal intercourse. This correlates with the literature on the risky nature of anal intercourse. Data suggest that anal intercourse leads to higher risk of HIV transmission than other forms of sexual activity including vaginal intercourse. (Reinisch, Hill, Sanders, & Ziebma-Davis, 1995; Varghese, Maher, Peterman, Branson, & Steketee, 2001).

The relationship between academic performance, sexually transmitted disease status, and condom use during vaginal intercourse also produced significant results; however, they were not what I expected. Having a lower grade point average increased the odds of wearing a condom during vaginal intercourse. One way to explain this is that students with lower grade point averages may be aware that they are engaging in riskier sexual behaviors and thus are more

likely to use protective barriers such as condoms. A similar phenomenon was seen with sexually transmitted disease status. The odds of wearing a condom during vaginal intercourse were twice as high for those with a positive STD status compared to those with a negative STD status. While the literature has consistently shown that the use of condoms during sexual activity can decrease the risk of acquiring sexually transmitted diseases including HIV ((Davis & Weller, 1993; Pinkerton & Abramson, 1997; Sanchez et al., 2003; UNAIDS, 2009; Winner et al., 2006), the study highlights an important, but often overlooked, fact about condoms...they are not 100% effective. Consequently, while using condoms may decrease the risk of contracting a sexually transmitted disease, it does not completely eliminate the risk as other factors, such as, choice of partner and sexual act also contribute to the risk associated with sexually transmitted diseases (Frances & Chin, 1987; Friedland & Klein, 1987; Peterman & Curran, 1986). Also, students who have previously contracted a sexually transmitted disease may be more likely to use condoms during vaginal intercourse because they may have already contracted a STD once and have in a sense “learned their lesson” and are more cautious so as not to acquire another sexually transmitted disease.

The study has produced rather robust findings and has identified unique correlations between academic performance, risky sexual behaviors and sexually transmitted disease diagnosis/treatment; however, it is important to note that we have to be careful not to infer that these same results are seen on an individual basis. I have identified a correlation but not causation so I cannot say that because student A has a high grade point average, he/she will not engage in risky sexual behaviors.

5.1.4 Relationship of Results to the Problem Behavior Theory

The Problem Behavior Theory confirms what seems to be intuitively obvious: high academic performance may work as a protective factor against engagement in risky sexual behaviors. The Problem Behavior Theory is driven by a social-psychological perspective that was used in this study to organize the variables and identify proneness to engaging in risky sexual behaviors and consists of three systems: perceived environment, personality and behavior. The occurrence of the behavior is considered an outcome of an interaction between environmental and personality influences.

When looking at the perceived environment it is imperative to note the uniqueness of a college environment. The college environment provides the “best” opportunity for students to engage in various risky behaviors. Students are living on their own and have fewer controls against engaging in risky sexual behaviors due to lack of parental influence. This becomes an issue because as the literature shows, students believe that their peers are frequently engaging in these behaviors (Martens et al., 2006; Page, Hammermeister & Scanlan, 2000) and these newfound peers are the students’ perceived models that work to support engagement in these risk behaviors. This type of perceived environment puts students at a greater risk for engaging in risky sexual behaviors due to the lack of available controls. With this current study I focused mainly on the motivational instigation structure of the personality system and the idea that when high value and/or expectations is placed on achieving good grades then behaviors will be directed as such. This works as a constraint to control behavior. However, when low value and/or expectation is placed on achieving good grades attention may be placed elsewhere. The personal belief structures within the personality system focus on the idea of normative behavior on college campus. In particular, the belief that everyone is engaging in sexual activity. This creates a space

where students might be more likely to engage in the behavior because they believe that “everyone is doing it.”

The findings underlined the importance of these structures and how they worked together to explain which students were more likely to engage in risky sexual behaviors. While analyzing the relationships between academic performance, risky sexual behaviors and sexually transmitted disease diagnosis/treatment I was able to identify grade point average as a constraint to engaging in various risky sexual behaviors as predicted by the theory. Students that achieved higher grades seemed to focus on that goal and generally engaged in fewer risky sexual activities than student with lower grade point averages. This is particularly essential because the perceived environment is, generally speaking, the same for all students. So being able to identify a protective factor in the personality system that can be modified to possibly decrease engagement in risky sexual behaviors is paramount to the creation and modification of future campus health services. This further supports the idea that the current sexual health approaches used at colleges and universities in the United States may need to be adapted into more multi-disciplinary methodologies. Instead of focusing solely on modifying sexual health behaviors, colleges and universities should seek to engage academic strategies and support from academic affairs to form collaborations geared towards helping the whole student.

5.2 STUDY LIMITATIONS

While the study produced meaningful results, it is important to note the limitations. One is that all of the data in this study were self-reported. General issues that are related to self-reported data such as social desirability and memory lapse may also be present in this study (Glass, Johnson & Vessey, 1974). Students were asked to recall information ranging from the

previous two weeks to a year ago. The limitation of self-reported data is especially important when analyzing the diagnosis of sexually transmitted diseases. Typically, sexually transmitted diseases are underestimated. One reason is because the respondent may not be aware that they have an STD because of the asymptomatic nature. Also because of the sensitive nature of sexual behaviors, self-reported data has been shown to be an open way for participants to disclose behaviors and sexually transmitted disease status that they might not have otherwise in interview and focus group settings (Boekeloo, Schiavo, Rabin, Conlon, Jordan, & Mundt, 1994; Trice, 1987).

Another limitation was presented in how approximate GPA was reported. Students were asked to report their GPA using grade categories. For students they may have had to guess what their grade point average was in the form of a letter because they are used to receiving it in the form of x.xx on 4.0 scale. Some universities are also on a plus-minus system. So in the cases where students reported a grade point average of a C, having the number form of their GPA may have better helped to understand the propensity for these students to sometimes display engagement in more risky sexual behaviors than students with a D/F. Students on the higher end of the C grade point average may have showed similar results to students that reported grade point averages of an A or B.

Also, factors other than grade point averages and sexually transmitted disease status such as socioeconomic status, family environment and health care accessibility are also likely to be predictors of risky sexual behavior. So we have to be careful not to focus all efforts on GPAs and STD status when attempting to solve the sexual health issues present in the college student population.

One must also have to keep in mind that the NCHA-II is a behavioral surveillance tool. It offers little information about personality traits or factors such as self-efficacy, and firm conclusions regarding causal directions cannot be drawn from correlational data.

5.3 FUTURE RESEARCH IMPLICATIONS

The study embodies the preliminary work in truly understanding the relationship between academic performance, risky sexual behaviors and sexually transmitted disease diagnosis/treatment. This study measured the correlations of these variables. The next step would be to identify the cause and effect. This would work best in the form of a mixed methods approach involving surveys and focus groups or face-to-face interviews. This would provide a better understanding of why students with lower grade point averages appear to engage in more riskier sexual behaviors than those with higher grade point averages. Longitudinal studies beginning with children at young ages may also help to reveal a better understanding of this phenomenon. While I know that other factors contribute to engagement of risky sexual behaviors, it would be beneficial to see the differences in students with lower grade point averages and students with higher grade point averages as they grow and enter college. It is also important to further investigate other factors that lead to engaging in risky sexual behavior such as self-esteem, the role of religion and family structures. The inclusion of multivariate models may better help in further understanding the reasons for the differences in risky sexual behaviors between students who are high academic achievers and ones who are low academic achievers.

5.4 CONCLUSION

Overall students that achieved higher grade point averages reported fewer sexual partners, increased condom use, and decreased engagement in anal intercourse. Similar results were found in other studies on the relationship between academic performance and risky sexual behaviors (Bingham & Crockett, 1996; Luster & Small, 1994). The findings are relevant to college administrators and health education professionals across the country. Identifying the characteristics that make higher achieving students less likely to engage in risky sexual behaviors compared to students with lower grade point averages can lead to a wealth of knowledge. Understanding the protective factors to engaging in risky sexual behaviors can contribute to successful prevention efforts on college and university campuses. There is something about students with higher grade point averages that may be leading them to make safer choices regarding their sexual risk behaviors. These students may be smarter or fall into the “geek” category. There is also the idea that these students may party less and study more. While studying more does not necessarily guarantee better grades, it will increase the chances of receiving higher grades compared to those who party a lot (Ashby Plant, Ericsson, Hill, Asberg, 2005). Identifying these characteristics is paramount to addressing this issue of increase sexual risk behavior in the college student population. Since we know that students are knowledgeable about the risks that lead to acquiring sexually transmitted diseases we have to get them to engage in fewer risky behaviors by modifying or enhancing identified protective factors, which in the case of the study, is academic performance in the form of grade point average. The correlation between academic performance and risky sexual behaviors is enough to show is that there is something that can be done on the academic side to, in a sense, protect students from themselves.

General health education programs and health centers that provide services to students on college campus should focus on fostering educational success and increase involvement in school and academics. This may indirectly help reduce engagement in risky sexual behaviors. Effective programming would consist of the traditional education about sexually transmitted disease prevention but would also include information regarding behavior modification. Specific behavior changes such as increased condom use, decreasing the number of sexual partners and limited engagement in risky sexual acts are important for college students. It is also important to include information regarding time management, study skills, self-efficacy and the importance of academic success in regards to health decision making. Students who are doing poorly in their courses and who are on academic probation typically have to meet certain requirements to return to good standing. One additional requirement can be meeting with a health educator in which they will cover risky sexual behaviors and assist students in navigating and addressing any concerns they may have regarding the topic. That would provide additional prevention programming for students that are experiencing difficulties in courses.

In summary, this study demonstrates the importance of expanding the current landscape of sexual health education on college and university campuses to include academic success. Students know the basics concerning risky sexual behavior and yet many still do not practice safer sex. This study helped to identify high grade point average as a protective factor against the engagement of risky sexual behavior. This knowledge makes it imperative for student affairs and academic affairs to collaborate in their efforts to create effective sexual health programming with components focusing on academic success.

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APPENDIX: NATIONAL COLLEGE HEALTH ASSESSMENT-II

The National College Health Assessment-II created by the American College Health Association used for the data analysis presented in this dissertation may be found in a supplemental file named **NCHA-II Fall 2010 Survey.pdf**.