

Copyright

By

Whitney Jaye Lang

2011

The Thesis committee for Whitney Jaye Lang

Certifies that this is the approved version of the following Thesis:

Obesity and Substance Use in College Students:

Does BMI Increase Risk?

APPROVED BY

SUPERVISING COMMITTEE:

Supervisor: _____

Keryn E. Pasch

Alexandra Loukas

**Obesity and Substance Use:
Does Higher BMI Increase Risk?**

by

Whitney Jaye Lang, B.A.

Thesis

Presented to the Faculty of the Graduate School
of the University of Texas at Austin
in Partial Fulfillment
of the Requirements
for the Degree of

Master of Science in Health Education

The University of Texas at Austin

August, 2011

Dedication

This thesis is dedicated to my parents who instilled in me a passion for learning, supported me steadfastly, encouraged me in all of my endeavors, and always believed in my potential.

Acknowledgements

I would like to acknowledge Dr. Keryn Pasch for all of her help in writing this thesis as well as her constant support, guidance, and dedication to her students. I would also like to acknowledge Dr. Alexandra Loukas for her help and support on this project as well.

Abstract

Obesity and Substance Use: Does Higher BMI Increase Risk?

Whitney Jaye Lang, MSHealthEd

The University of Texas at Austin, 2011

SUPERVISOR: Keryn Pasch

Emerging adulthood is a time of significant change where behaviors are adopted that can have significant long term effects on health. The most dramatic increases in weight are occurring among emerging adults, especially those with some college education. Emerging adults are also at an increased risk for substance use and abuse. The current study examined the relationship between BMI and substance use among college students. Participants included 703 undergraduate students at a large public U.S. university (*M* age=20.6, 58.7% Non-Hispanic White, 59.8% female). Students completed an online survey with items on substance use behaviors such as smoking, alcohol use, marijuana use, and binge drinking. Tobacco, alcohol, marijuana use, and binge drinking were assessed with one question asking students how many days over the past month they had used the specific substance (range 0-30 days). Binge drinking was assessed using one question: “Over the last two weeks, how many times have you had five or more drinks of alcohol at a sitting?” Responses ranged from 0 to 10 or more times. Substance use behaviors were coded to no use/any use in the past month. Body mass index was calculated through the student’s self reported height and weight. BMI was significantly related to past month tobacco use with an odds ratio of 1.06 (95% CI: 1.01-1.12). Specifically, with every one unit increase in BMI, the odds of past month tobacco use increased by 6%. However, BMI was not significantly associated with past month alcohol

use, marijuana use, or binge drinking ($p > .05$). As BMI increases, college students' odds of using tobacco increase. This finding is particularly problematic given that weight gain is common among undergraduate students and cigarette use has been cited as a common weight management practice among this group as well. Future research should consider the role of BMI as a factor in decreasing tobacco use.

Table of Contents

Chapter 1: Emerging Adulthood.....	1
Chapter 2: Risk Behaviors among College Students.....	5
Alcohol Use.....	5
Binge Drinking.....	6
Tobacco Use.....	7
Marijuana Use.....	8
Chapter 3: Overweight and Obesity in the United States.....	9
Epidemiology of Overweight and Obesity among Emerging Adults.....	9
Chapter 4: BMI and Risk Behaviors.....	13
Relationships in Previous Literature.....	13
Involvement in Risk Behaviors.....	16
Chapter 5: Methods.....	20
Study Design and Sample Characteristics.....	20
Measures.....	21
Statistical Analyses.....	22
Chapter 6: Results.....	24
Descriptive Results.....	24
Gender Differences.....	24
Differences in Race/Ethnicity.....	25

Association between BMI and Risk Behaviors.....	25
Chapter 7: Discussion.....	27
Limitations.....	32
Conclusions.....	33
Appendix A: IRB Approval Letter.....	34
Appendix B: NCHA Survey.....	37
References.....	49
Vita.....	67

List of Tables

Table 1: Prevalence of BMI and Substance Use Behaviors.....	24
Table 2: Associations between Substance Use and BMI.....	26

Chapter 1: Emerging Adulthood: Theory and Implications

The Theory of Emerging Adulthood

In recent years, a new period of development has emerged that bridges the gap between adolescence and adulthood. This period, from the late teens to early twenties, has been identified by developmental psychologist Jeffery Jensen Arnett as “emerging adulthood” (Arnett, 1998a, 2000, 2004). Emerging adulthood is characterized as the third decade of life where there is relative independence from social roles and normative expectations (Arnett, 2000). It is during this period that individuals are likely to explore different directions in love, work and worldviews (Arnett, 2000). Emerging adults also tend to have a wider scope of possibilities and are much less likely to be contained by role requirements (Arnett, 2000; Salmela-Aro, Aunola, & Nurmi, 2007). This in turn provides more opportunity to look for different areas of achievement such as involvement in volunteer organizations like the Peace Corps or pursuing a higher educational degree.

According to Arnett (2000), emerging adulthood is neither adolescence nor young adulthood, as it is theoretically and empirically distinct from each. Emerging adults are free from parental control but have not yet made commitments to achieve their adult status, such as full time employment, owning a home, or being financially independent (Arnett, 2004). For the emerging adult, there is much more demographic variability when compared to an adolescent or young adult (Arnett, 2000). For example, in adolescence individuals likely live at home with a parent or guardian while going to high school and, for some, also working while young adults tend to have already graduated college,

obtained full time employment, and are involved in serious relationships. Emerging adults on the other hand tend to have an unstable residential status because they are more likely to move frequently and are also likely to move in and back out of their parents' homes at least one time during this stage (Arnett, 2000; Goldschnieder & Goldschnieder, 1994). Emerging adults also tend to enter into higher education, but in a non-linear way; many may combine school and work or will take time off of school incrementally for work or other endeavors (Arnett, 2000).

Emerging adulthood differs subjectively from adolescence and young adulthood as well. Emerging adults tend to adhere to different criteria than their parents for the fulfillment of adult roles. They focus more on qualities of character, not normative demographic transitions, as criteria for the attainment of adulthood (Arnett, 1998). For example, whereas parents may choose norm compliance such as getting married and buying a home as the metric for attainment of adulthood (Nelson et al., 2007), the emerging adult may choose financial independence and being responsible for one's self (Arnett, 2000). Societal norms have changed in comparison to 20 or 30 years ago as well. The number of young people entering into higher education has increased from 7.4 million in 1971 to 16.4 million in 2008 and this number is projected to reach 19 million by 2019 (Aud et al., 2010). Emerging adults are also waiting longer to get married and enter into parenthood. For example, from 1970 to 2000 the mean age of marriage increased from 21 to 25 for women from 23 to 27 for men (Arnett & Taber, 1994; U.S. Bureau of the Census, 2000).

While emerging adulthood can be viewed as an exciting time of identity exploration, it is also a time of uncertainty where supportive ties that were prevalent in adolescence begin to weaken and interpersonal influences change (Park, Mulye, Adams, Brindis, & Irwin, 2006; Nelson, Story, Larson, Neumark-Sztainer, & Lytle, 2008). It is also a time where some individuals begin adopting behaviors that if maintained, can have long term effects on their health (Nelson, Pasch, Lust, Story, & Ehlinger, 2009). For example, emerging adulthood is associated with significant increases in tobacco use, high-risk alcohol use, and illicit drug use (NSDUH, 2008; Fromme, Corbin, & Kruse, 2008; Harris et al., 2006). College students also tend to be among the highest-risk subgroups of emerging adults with regard to binge drinking (Slutske, 2005; Substance Abuse and Mental Health Association [SAMHSA], 2010), impaired driving, (Chou et al., 2005), multiple sexual partners (Fromme, Corbin, & Kruse, 2008), and misuse of prescription drugs (SAHMSA, 2010; McCabe, Knight, Teter, & Wechsler, 2005). Additionally, past research has determined that high risk behaviors in college students tend to co-occur (Nelson Laska et al., 2009). Many of these risk behaviors are often first initiated in adolescence (Steinberg, 2004) and have been shown to track from adolescence to young adulthood (Grant, 1998).

It is during the period of emerging adulthood that the risk behaviors developed in adolescence may become more prevalent and dangerous (Arnett, 2005). It is also possible that the instability and uncertainty involved with emerging adulthood causes some individuals to turn to substance use as a way to deal with the situation they are in, potentially increasing their risk for substance abuse and dependence in the future.

Therefore, it is important to understand the factors that influence substance use among emerging adults in order to inform prevention efforts and decrease the potential for lifetime engagement in risk behaviors, substance abuse, and dependence disorders.

Chapter 2: Risk Behaviors among College Students

Alcohol Use

Previous research has documented that rates of substance use tend to peak during young adulthood (Park et al., 2006). Alcohol, in particular, is a very commonly used substance among college students and alcohol consumption contributes to the three leading causes of death for this group; unintentional injury, homicide, and suicide (CDC, 2010). Prevalence of alcohol use on college campuses is high despite the fact that alcohol is illegal for many students (Wechsler, Lee, Nelson, & Kuo, 2002a). Nearly half of all alcohol consumed on college campuses is by underage drinkers (Wechsler et al., 2005) and recent data from a national study shows that 65.2% of college students report using alcohol within the last 30 days (ACHA, 2010). This is a 6% increase from 2009 where 59.2% reported using any alcohol in the past month. Currently, males and females report similar rates of past month alcohol use at 66.3% and 64.8%, respectively (ACHA, 2010).

Alcohol use is also associated with other risk behaviors common among emerging adults, including high-risk sexual behavior, smoking, and physical fighting (CDC, 2010). In fact, nearly 35% of males and females reported doing something they later regretted after drinking (ACHA, 2010). For example, an estimated 31.2% of college males and females reported forgetting where they were or what they did after drinking and 16.6% reported injuring themselves in some way (ACHA, 2010). While not as common, 5.1% of college students report that alcohol use has affected their individual academic performance (ACHA, 2010).

Binge Drinking

Excessive alcohol use, including both binge and heavy drinking, contributes to 79,000 deaths annually (CDC, 2001). Heavy drinking is defined as drinking an average of more than two drinks per day for males or more than one drink per day for females (CDC, 2010), is also common among this age group. Findings from a study by Dawson et al. (2004) show that among a sample of adults ages 18-29, 21.1% report engaging in heavy drinking more than once a month and 11% report heavy drinking more than once per week. Binge drinking is defined as five or more drinks in one sitting for males and four or more drinks in one sitting for females (National Institute of Alcohol Abuse and Alcoholism [NIAAA], 2004). Currently, an estimated 35.1% of college students report consuming 5 or more drinks in one sitting in the past two weeks (ACHA, 2010). More specifically, 18% report consuming 7 or more drinks the last time they partied (ACHA, 2010). Gender differences also exist with regard to binge drinking with an estimated 43.5% of males reporting any binge drinking in the last two weeks compared to 30.3% of females (ACHA, 2010).

It is currently estimated that 75% of alcohol consumed by adults in the U.S. is in the form of binge drinking (Office of Juvenile Justice and Delinquency Prevention [OJJDP], 2005). Furthermore, adults ages 18-34 tend to be one of the highest-risk groups with regard to binge drinking (Slutske, 2005; SAMHSA, 2010; CDC, 2010). In 2009, among individuals aged 18 to 25, the rate of binge drinking was estimated at 41.7%

(NSDUH, 2009), and for those between the ages of 18-20, it is estimated that 90% of alcohol consumption is in the form of binge drinking (OJJJ, 2005).

Tobacco Use

Along with alcohol use, tobacco use among college students is also a major public health concern. It is currently estimated that 1 in 8 college students report beginning smoking while in college (Wetter et al., 2004). Currently, 46 million adults in the U.S. smoke (CDC, 2010) and compared to youth ages 12-17 and adults over the age of 26, young adults in a college population have the highest rate of current tobacco use (SAHMSA, 2010). National statistics from the CDC show that tobacco use is more common among adult males, with 23.5% of males reporting smoking cigarettes compared to 17.9% of females (CDC, 2010). Current data from the ACHA show similar findings for college students with 19.2% (16% of males and 14% of females) reporting smoking cigarettes in the past 30 days (ACHA, 2010).

Tobacco is often used with other substances, and past research has documented a relationship between the use of both alcohol and tobacco among college students (Reed, Wang, Shillington, Clapp, & Lange, 2007; McKee, Hinson, Rounsaville, & Petrelli, 2004; Weitzman & Chen, 2005; Hines, Fretz, & Nollen, 1998). For example, in a cross-sectional study of conjoint cigarette and alcohol use in a college population, Jackson, Colby, and Sher (2010) found that participants reported smoking more on days where they drank alcohol and drinking more alcohol when they smoked. More specifically, on a

day where participants reported using alcohol, 85% of cigarettes smoked that day were smoked while drinking (Jackson et al., 2010).

Marijuana Use

In addition to high rates of alcohol and tobacco use, emerging adulthood is also the period where the prevalence of drug use and abuse are highest (Arnett, 2005). In 2009, SAMHSA reported that an estimated 16.7 million people reported using marijuana in the past year (SAMHSA, 2010) and illicit drug use, including marijuana, was highest among individuals between the ages of 18-25 in comparison to youth 12-17 and adults over age 26 (SAMHSA, 2010). Marijuana is the most widely used illicit drug among young adults (Johnston, O'Malley, Bachman, & Schulenberg, 2005) and rates of use have been shown to increase most rapidly among those enrolled in college (Schulenberg, O'Malley, Bachman, & Johnston, 2000). Recent data from the ACHA suggest that 17% of college students reported using marijuana within the past 30 days (ACHA, 2010). Rates are significantly different between males and females with an estimated 21.1% of males reporting using in the last 30 days compared to 14.4% of females (ACHA, 2010). Like tobacco and alcohol, marijuana is frequently used with other substances. For example, surveys from The Harvard School of Public Health from 1993-1999 show that over 90% of the students who used marijuana also engaged in other high risk activities, including cigarette use and heavy alcohol use (Gledhill-Hoyt, Lee, Strote, & Wechsler, 2000).

Chapter 3: Overweight and Obesity in the United States

Currently, the prevalence of obesity among adults in the U.S. is 33.8% (Flegal, Carroll, Ogden, & Curtain, 2010). In other words, approximately 2.1 million adults in the U.S. have a Body Mass Index (BMI) greater than 30. The rate of adults who are overweight or obese has doubled from 1976 to 2004 (CDC, 2005), despite the Surgeon General's call for public health action in 2001 (USDHHS, 2001). According to the Centers for Disease Control and Prevention (CDC), in 2009 not one state was able to meet the *Healthy People 2010* goal of 15% obesity (CDC, 2010) and rates actually increased nearly 7% from 1999-2002 (USDHHS, 2009). The current Healthy People 2020 guidelines aim to reduce the overall rate to 30.6% (USDHHS, 2010).

Epidemiology of Overweight and Obesity among Emerging Adults

The most dramatic increases in obesity are occurring among individuals between the ages of 18-29, specifically those with some college education (Mokdad et al., 1999). Most recently, a 2010 report from the American College Health Association (ACHA) showed that 33.5% of college students were overweight or obese based on self-reported height and weight values (ACHA, 2010). Body weight is influenced by many factors including genes, culture, metabolism, environment, and individual health behaviors (CDC, 2010). Several specific health behaviors have been shown to increase the risk for obesity including sedentary lifestyle (Ford, Kohl III, Mokdad, & Ajani, 2005), unhealthy dietary behaviors such as consumption of sugar sweetened beverages (Hu & Malik, 2010; Berkey, Rockett, Field, Guillman, & Colditz, 2004) and fast food (Duffey, Gordon-

Larsen, Jacobs, Williams, & Popkin, 2007), breakfast consumption (Timlin et al., 2001), as well as sleep (Anic, Titus-Ernstoff, Newcomb, Trentham-Dietz, & Egan; Cappuccio et al., 2008).

Many of these individual health behaviors contribute to weight increases during college. Although not all incoming freshmen will become overweight or obese, weight gain during college has been reported in multiple studies (Wengreen & Moncur, 2009; Matvienko, Lewis, & Schafer, 2001; Butler, Black, Blue, & Greteback, 2004). A meta-analysis by Vella-Zarb and Elger (2009) examined studies of freshman weight gain from 1985 to 2008 and determined that the average weight gain was around 3.68 pounds. The majority of reported gains in weight also tend to differ between males and females. For example, a longitudinal study by Racette, Duesinger, Strube, Highstein, and Duesinger (2008) determined that from their freshman to senior year, males gained an average of 9.3 pounds while average weight gain among females was 3.8. These differences underscore the importance of tailoring health promotion programs to increase the involvement of young males.

Other longitudinal research examining weight gain among college freshman found that while only 29% of incoming freshman reported exercising, 50% reported frequently eating fast food, and over 70% reported getting less than five servings of fruits and vegetables each day (Racette et al., 2005). When data were collected again during their sophomore year, 70% of the participants showed increases in both body weight and BMI (Racette et al., 2005).

Within the literature there are also differences reported for weight gain in the early years of college as compared to later. For example, in a longitudinal study of five year weight changes in individuals aged 18-30 years, Burke et al (1996) found that gains in weight and BMI were significantly greater in 18-24 year olds versus 25-30 year olds. Though past research is not conclusive on weight gain during college, those who gain significant amounts of weight can face an increased risk of serious future health problems, including heart disease, stroke, and Type 2 diabetes (CDC, 2009). Previous research has also shown that weight status shows strong tracking from adolescence to adulthood (Serdula, Ivory, Coates, Freedman, Williamson, & Byers, 1993; Srinivasan et al., 1996; Gordon-Larsen, The, & Adair, 2010). For example, a longitudinal study by Gordon-Larsen et al (2010) followed a cohort of U.S. adolescents from the National Longitudinal Study of Adolescent Health (Ad Health) for 12 years from middle school to age 30 to determine the incidence and persistence of obesity across time. Results showed that the prevalence of obesity doubled from adolescence to the early 20s and then doubled again from the early to late 20s (Gordon-Larsen et al., 2010). These results are particularly important for college students as lifestyle behaviors begin to change during emerging adulthood, specifically physical activity and dietary intake.

The early years of college are associated with marked declines in physical activity (Leslie, Sparling, & Owens, 2001) and past research shows the highest rates of decline occur from the ages of 18-24 (Grubbs & Carter, 2002). For example, recent data suggest that in 2010, only 19.2% of college students reported exercising at moderate intensity for 30 minutes five or more times per week and only 31.3% reported vigorous exercise for 20

minutes three or more times per week, as recommended by the American College of Sports Medicine (ACHA, 2010). Additionally, poor diet quality is common among college students with only 6% reporting getting the recommended five servings per day of fruits and vegetables (ACHA, 2010). Given the rapidly growing rate of obesity among emerging adults and the increase in prevalence of risk behaviors, it is important to determine if those who are overweight or obese are more likely to engage in risk behaviors compared to those who are normal weight or vice versa.

Chapter 4: Body Mass Index and Risk Behaviors

Relationships in Previous Literature

Previous studies have examined the relationship between BMI and substance abuse, including alcohol and marijuana, however these studies included specific samples of adult men and women only. For example, a study by Kleiner et al (2004) determined that among weight-management patients, alcohol use was inversely related to BMI. Specifically, women who were more obese were less likely to drink alcohol (Kleiner et al., 2004). Though inconclusive, previous studies have determined the opposite relationship between BMI and alcohol for men (Wannamethee & Shaper, 2003). In a similar study among weight-management patients, BMI was also found to be inversely related to marijuana use among women (Warren, Forst-Pineda, & Gold, 2005). These findings were consistent with previous research suggesting that overeating and obesity can be protective against drug reward and addiction (Warren & Gold, 2007). While these studies were conducted with a specific population, findings suggest that the relationship between BMI and substance use may differ among men and women. Other research examining this relationship has yielded similar results. For example, Barry and Petry (2009) determined that overweight and obesity were related to lifetime alcohol use and dependence in adult men, but not in adult women. Furthermore, being overweight was related to an increased risk for lifetime nicotine dependence among women, but not for men. Finally, BMI was not associated with illicit drug use disorders for either men or women.

While the relationship between BMI and substance use has not been determined for college students, the co-occurrence of risk behaviors has been established in past literature. For example, a study by Nelson Laska et al (2009) identified four different classes of risk behaviors in a sample of undergraduate students. The classes of risk behaviors varied by gender and included traditional risk behaviors (i.e. binge drinking, smoking) as well as lifestyle related behaviors (i.e. physical activity, diet). For example, females in Class 1 were considered low risk because they were not likely to engage in traditional risk behaviors, however they had the poorest diet quality and were least likely to exercise regularly. Class 1 for males was similar in that they were less likely to engage in traditional risk behaviors and were more likely to report lifestyle related factors of poor stress management and poor sleep habits. While it is promising that those in Class 1 exhibit low risk for traditional risk behaviors, the low physical activity rates and poor diet quality increase the risk for health problems in the future. It is also important to note that overall, one in four females and one in three males were classified as high risk with regard to both traditional risk and lifestyle related behaviors (Nelson Laska et al., 2009).

While this study did not determine the relationship between risk behaviors and BMI, the results show the covariance of risk and lifestyle-related behaviors in undergraduate students and clearly indicate that there is a wide range of needs for health promotion and prevention programs in the university setting. Traditional programs targeting substance use alone will not reach those that are at a high risk for substance use but also engage in poor lifestyle related behaviors or those that are at a lower risk for substance use but high risk for poor lifestyle related behaviors. The inclusion of lifestyle

related behaviors into the different classes also challenges the idea of a traditional risk profile. When it comes to disease prevention, lifestyle related behaviors are typically included as indicators of increased susceptibility or risk. These findings underscore the importance of expanding what is traditionally high risk to include lifestyle related behaviors to better identify those who may be the most at risk.

The different classes determined by Nelson Laska et al (2009) provide an example of the co-occurrence of traditional risk behaviors while also highlighting lifestyle behaviors that can put an individual at risk. An important question to ask is why some individuals are more likely to engage in multiple risk behaviors (both traditional and lifestyle related) while others do not. Despite traditionally being used for adolescents, Problem Behavior Theory may provide insight into the co-occurrence of risk behaviors during emerging adulthood. Using problem behavior theory as a conceptual framework, we know that problem behaviors tend to co-occur (Jessor & Jessor, 1977), however, this theory has been limited to those traditional behaviors that put an individual at risk (i.e. alcohol use, tobacco use, violent or deviant behaviors). By not engaging in physically activity, getting proper sleep, or eating healthy foods, individuals put themselves at risk for immediate health effects and future chronic disease. If problem behaviors are expanded to include all of these behaviors that put an individual at risk, then being overweight or obese could be considered a risky or “problem” behavior. The implications of obesity can be just as serious as the implications of substance use and it is important to understand if the two are related during emerging adulthood.

No studies to my knowledge have specifically explored this relationship between substance use and BMI in college students. However, this relationship has been established among adolescents. For example, in a cross-sectional study by Fonseca et al (2009) determined that obese adolescents were more likely to report daily alcohol use and more drunkenness than their peers who were normal weight. Other research by Pasch, Nelson, Lytle, Moe, and Perry (2008) examined this relationship longitudinally and determined that increased use of alcohol, tobacco and other drugs, along with fighting and depression among 7th grade students predicted increases in BMI by 8th grade. However, the students with higher BMI in 7th grade were not more likely to engage in risk behaviors a year and a half later, (Pasch et al., 2008). It is possible that those youth who engaged in risk behaviors were more likely to engage in unhealthy weight related behaviors like low physical activity and unhealthy eating.

Involvement in Risk Behaviors

There are several reasons why adolescents who are overweight or obese might engage in other risk behaviors. For example, adolescents who are overweight are more likely to be teased by their peers (Neumark-Sztainer et al., 2002) and may use substances as a way to deal with negative feelings about themselves and their body. These weight related social/emotional issues may also be prevalent among college students and can potentially lead to use of substances such as alcohol and tobacco to deal with negative emotional states. Because they may not be able to manage negative affect on their own, individuals who are overweight or obese may rely on substances to achieve a stable

emotional state (Khantzian, Halliday, & McAuliffe, 1990; Suh, Ruffins, Robins, Albanese, & Khantzian, 2008). However, use of substances to regulate emotional states is potentially problematic. For example, a consequence of alcohol use is negative affect so the use of alcohol to attenuate the symptoms of negative affect can result in a dangerous cycle (Hussong, Gould, & Hersh, 2008) potentially leading to abuse or dependence.

Attending college can also be a stressful experience for the emerging adult. Moving away from home, adjusting to life on campus, change in sleep habits, financial issues, and challenging course work can all cause feelings of being stressed or overwhelmed (Ross, Niebling, & Heckert, 1999; Dussler, Dunn, Wang, Shelley, & Whalen, 2005). Currently, over 40% of college students report that they felt more than average stress in the past year (ACHA, 2010) and substance use has been shown to be associated with stress among college students. For example, previous research by Naquin and Gilbert (1996) determined that stress levels were higher among college students who smoked compared to those who did not. In study of perceived stress among college students in the United Kingdom, Serlachius et al (2007) determined that stress was strongly associated with higher weight gain, specifically among females. Other qualitative research by Nelson et al (2009) found similar results with students reporting that weight gain during college was influenced by stress.

Changes in lifestyle related behaviors like physical activity and healthy eating during college are significantly related to changes in weight; however some students may enter college already overweight or obese and may not know where to find resources to

help them make changes to lead a healthier lifestyle. Not being aware of or being able to access the resources on campus may lead to complacency about their health. Nelson et al (2009) determined that experiences with recreational services can also influence physical activity in college students. In their study, students reported that negative experiences with recreational services, such as overcrowding and being intimidated, influenced weight changes and physical activity (Nelson, Kocos, Lytle, & Perry, 2009). If students are unaware of recreational services or are intimidated by them, engaging in risk behaviors such as tobacco use may then serve as a way to control or lose weight. For example, a cross-sectional study by Carroll et al (2006) determined that current smoking status in college students was related to intention to lose weight. Current smoking was also related to other lifestyle related behaviors related to weight gain such as eating high calorie foods and eating while watching television (Carroll et al., 2006).

Emerging adults who are attending college also have more autonomy when it comes to their behavioral choices and some may choose to engage in risk behaviors like alcohol use because they want to experiment. Most college students perceive that their peers are engaging in risk behaviors and this may influence their choices. For example, in 2010 nearly 95% of college students believed their peers used alcohol in the past month (ACHA, 2010). Eighty-one percent believed their peers used marijuana and 82.7% believed their peers used cigarettes in the past month (ACHA, 2010). Actual past month rates of substance use were much lower at 65.2% for alcohol, 16% for cigarettes, and 18% for marijuana (ACHA, 2010). The perception that the majority of students engage in risk taking behaviors may influence their choice as it would seem that substance use is

the norm. Additionally, some students report that alcohol use is related to overeating, which may be associated with weight gain as well. For example, in a qualitative study by Nelson et al (2009) student's narratives explained that food is consumed before drinking alcohol in order to drink more, but is also consumed late at night after alcohol use (Nelson et al., 2009).

Given that past literature has shown that weight status and risk behaviors (Serdula et al., 1993) are likely to track from adolescence into adulthood, it is important to understand the mechanisms behind this relationship after middle and high school, during the college years where risk behaviors become more prevalent and the potential for developing lifetime behaviors increases. Therefore, the purpose of this study was to determine the prevalence of substance use behaviors as well as the relationship between substance use behaviors and BMI among college students. It is hypothesized that the prevalence of substance use behaviors will be similar to national rates for college students and those with higher BMIs will be more likely to be involved in substance use behaviors compared to those with lower BMIs.

Chapter 5: Methods

Study Design and Sample Characteristics

The data for this cross-sectional study were drawn from the National College Health Assessment, administered by the American College Health Association (ACHA). The National College Health Assessment is used by over 300 colleges and universities nationwide to collect data about alcohol, tobacco, and other drug use, sexual health, weight, nutrition, and exercise, mental health, and personal safety and violence (ACHA, 2009). A random sample of 5,000 participants was generated from the Registrar's list of currently enrolled undergraduate and graduate students at the University of Texas at Austin in the spring of 2010. Once the sample was produced, the list of participants and their email addresses were submitted to the American College Health Association, who then sent an invitation email with a URL link to complete a statement of informed consent and the online survey. The computer-based survey was completed online at the convenience of each participant and took around 30 minutes to complete. Data were collected during the spring of 2010. Ethical clearance for the study was obtained from the Institutional Review Board at the University of Texas at Austin.

A total of 858 undergraduate and graduate students enrolled at the University of Texas at Austin during the spring 2010 semester completed an online survey. The response rate for the survey was 17.2% percent. For this study, the participants were limited to the 703 undergraduate students. Participants were 63.4% Non-Hispanic White, 16.0% Hispanic/Latino, 2.4% Black, Non-Hispanic, and 24% other (comprising 'Asian or

Pacific Islander'; 'American Indian, Alaskan Native, or Native Hawaiian'; 'Biracial or Multiracial'; and 'other'). The sample was approximately 58.9% female and the average age was 20.6 years. In 2010 there were 38,420 undergraduate students at the University of Texas at Austin. Females represented 51.3% of undergraduate students and the average age was 20.6 years. The distribution of race/ethnicity among undergraduates was 51.7% Non-Hispanic White, 19.4% Hispanic/Latino, 4.7% Black Non-Hispanic and 23.3% Other.

Measures

Demographic Characteristics. Demographic variables included gender, race/ethnicity, age in years and year in school. Gender was denoted as female or male. Race/ethnicity was selected from a list including: White, non Hispanic (includes Middle Eastern), Black, non Hispanic, Hispanic or Latino/a, Asian or Pacific Islander, American Indian, Alaskan Native, or Native Hawaiian, Biracial or Multiracial, and Other. Race/ethnicity was coded as White versus non-White. Age was assessed by self reported age at time of survey completion.

Cigarette Use. Past month cigarette use was assessed with one question, asking students how many days over the past month they had used cigarettes. Response options were, never used, have used but not in the last 20 days, 1-2 days, 3-5 days, 6-9 days, 10-19 days, 20-29 days, and used daily. Responses were dichotomized as no use/any use in the past month.

Alcohol Use. Past month alcohol use was assessed using one question, asking the students how many days over the last month they had used alcohol. Responses ranged from never used, used but not in the last 30 days, 1-2 days, 3-5 days, 6-9 days, 10-19 days, 20-29 days, and used daily. Responses were dichotomized as no use/any use in the past month.

Marijuana Use. Past month marijuana use was assessed using one question: “How many days over the last month have you used marijuana?” Responses ranged from never used, have used but not in the last 30 days, 1-2 days, 3-5 days, 6-9 days, 10-19 days, 20-29 days, and used daily. Responses were dichotomized as no use/any use in the past month.

Binge Drinking. Binge drinking was assessed using one question: “Over the last two weeks, how many times have you had five or more drinks of alcohol at a sitting?” Twelve response options ranging from not applicable/don’t drink to 10 or more times were provided. The responses were dichotomized into no binge drinking versus any binge drinking.

Body Mass Index. Participants self reported height in feet and inches and weight in pounds. BMI was then calculated from the reported measures and dichotomized as not overweight (including normal and underweight) and overweight (including overweight and obese) .

Statistical Analysis

Descriptive analyses were used to determine the prevalence of obesity and multiple substance use behaviors among the sample of undergraduate students. Chi-

square tests determined gender differences in substance use behaviors as well as differences between white and non-white students. Logistic regression analyses were used to determine the relationship between BMI and past month cigarette, marijuana, and alcohol use, past two week binge drinking, past month drinking and driving after any alcohol, and past month binge drinking and driving. All analyses controlled for race, gender, and age in years. All data were analyzed using SPSS version 16.0 (SPSS, 2007).

Chapter 6: Results

Descriptive Results

Overall, 12.5% of participants self-reported using tobacco in the last 30 days. Sixty-seven percent reported past month alcohol use and 33.9% reported binge drinking in the last two weeks. Past month marijuana use was 17.1%. Average BMI was 23.1 and the majority of the sample was classified as normal or under weight (74.9%) with 25.1% classified as overweight or obese based on the self-reported height and weight values.

Table 1 shows the overall prevalence of substance use behaviors as well as BMI.

Table 1. *Prevalence of BMI and Substance Use Behaviors (n=703)*

	Overall	Males	Females	White	Non-White
Risk Behaviors					
%Cigarette Use	12.5	16.0 ^a	10.3	14.8 ^b	9.3
%Alcohol Use	67.0	66.0	69.2	76.0 ^b	56.0
%Marijuana Use	17.1	21.6 ^a	14.1	23.0 ^b	8.6
%Binge Drinking	33.9	35.8	32.6	40.8 ^b	24.1
BMI					
%Overweight	25.1	32.4 ^a	20.5	23.0	28.2

a. Significant difference between males and females at $p < .05$ level

b. Significant difference between White and Non-White at $p < .05$ level

Gender Differences

Males and females were not significantly different with regard to past month alcohol use, $\chi^2(1, N=702) = .77, p = .37$, or past two week binge drinking, $\chi^2(1, N=702) = .77, p = .38$. Past month tobacco use was significantly different, $\chi^2(1, N=701) = 4.98, p = .03$, for males and females with 16% of males reporting using tobacco compared to

10.2% of females. Past month marijuana use also varied by gender, $\chi^2(1, N=700) = 6.70$, $p = .01$, with significantly more undergraduate males (21.6%) reporting using marijuana compared to 14.1% females. BMI was significantly different, $\chi^2(1, N=701) = 12.65$, $p < .0001$, for males and females with 32.4% of males classified as overweight or obese, compared to 20.5% of females. Table 1 shows gender differences in BMI and prevalence of substance use behaviors.

Differences in Race/Ethnicity

White students were significantly more likely than non-white students to report past month use of cigarettes, alcohol, marijuana, and past two week binge drinking ($p < .05$). No differences were found between white and non-white students with regard to BMI ($p > .05$). Table 1 shows differences in prevalence of substance use behaviors and BMI among white and non-white students.

Association between BMI and Substance Use Behaviors

There was a significant association between BMI and cigarette use ($p < .05$), with an odds ratio of 1.06 (95% CI: 1.01-1.12). Specifically, with each one unit increase in BMI, the odds of past month cigarette use increased by 6%. The association between BMI and past month alcohol use, marijuana use, past two week binge drinking was not significant ($p > .05$). The association between BMI and past month cigarette, alcohol, and marijuana use, past two week binge drinking, and past month driving after any alcohol was not significant ($p > .05$) after BMI was dichotomized into overweight and not overweight. Table 2 shows the associations between BMI and substance use behaviors.

Table 2. Association between BMI and Substance Use Behaviors (n=703)

Substance Use Measures	<i>p</i>	Odds Ratio	95% CI
Tobacco Use*	.03	1.06	1.01-1.12
Alcohol Use	.78	1.01	.97-1.05
Binge Drinking	.78	1.01	.97-1.05
Marijuana Use	.13	1.04	.99-1.09

*Significant at $p < .05$ level

There were significant differences ($p < .05$) between males and females with regard to BMI and prevalence of cigarette use and marijuana use. However, there were no significant gender differences in the relationships between substance use and BMI ($p > .05$). There were also significant differences ($p < .05$) between White and Non-White students with regard to past month alcohol use, cigarette use, marijuana use, and past two week binge drinking. However, there were no significant differences in the relationships between substance use behaviors and BMI by race/ethnicity ($p > .05$).

Chapter 7: Discussion

The purpose of the current study was to examine the prevalence of obesity and several substance use behaviors among college students as well as the association between BMI and substance use. Overall, the majority of participants in this study were classified as normal weight (74.9%), while 25.1% were classified as overweight or obese, slightly lower than national findings from the 2010 National College Health Assessment, which estimated 33.5% were overweight and obese (ACHA, 2010). Similar to national data (ACHA, 2010), significant gender differences in BMI with 32.4% of males and 20.5% of females being classified as overweight and obese. Given that one of the goals for *Healthy People 2010* was to reduce the obesity rate to 15% for the nation by 2010 (USDHHS, 2009), data from this study suggest that there is still a way to go among the college population. Additionally, the Healthy People 2020 goals specifically target reducing the amount of inappropriate weight gain among multiple groups, including individuals ages 20 and over (USDHHS, 2010). Significant changes in lifestyle occur when individuals enter college and some studies estimate that the incidence of obesity can double from the late teens to the early twenties and double again from the early to late twenties (Gordon-Larsen et al., 2010). Given potential for significant weight gain during and after college, it is important for public health professionals to focus obesity prevention efforts on universities as well.

With regard to tobacco use, males were significantly more likely to report using cigarettes in the past month in comparison to females. This is consistent with the 2009

data from the CDC indicating that tobacco use is more common among adult males, with 23.5% of males reporting currently smoking cigarettes compared to 17.9% of females (CDC, 2010). Similar to obesity, the rate of cigarette use in this sample (12.5%) exceeded the Healthy People goal for tobacco use among 18-25 years olds (6.6%) (UDHHS, 2010). However, the smoking rate in the current study is below the CDC average estimate of 21.5% for individuals ages 18-24 (CDC, 2010) and below the estimate of 16% from the 2010 NCHA (ACHA, 2010). While this is positive, there is much work to be done. Given that males tend to report using tobacco more than females, prevention efforts must also focus on tailoring programs to appeal to both genders and increase participation of male students.

The prevalence of marijuana use in this sample (17%) was similar to the national rate among college students (17%; ACHA, 2010) and slightly lower than the national rate of 18.1% among adults ages 18-25 (SAMHSA, 2009). There were also differences in past month marijuana use by males and females with 21.6% of males and 14.1% of females reporting past month use. This is consistent with national findings which indicate that more males than females are using marijuana (ACHA, 2010).

A larger percentage of participants (67%) reported alcohol use in the past month and nearly 34% reported binge drinking. Recent studies estimate that 31% of college students meet criteria for a diagnosis of alcohol abuse and 6% meet the criteria for a diagnosis of alcohol dependence (Knight et al., 2002). Additionally, the prevalence of alcohol use is high on college campuses and national statistics show an increase of nearly

6% in the past year (ACHA, 2010). Alcohol use continues to be a serious public health issue on college campuses and public health professionals must continue to focus prevention efforts on reducing the rates of alcohol use among college students.

When exploring the associations between BMI and substance use, the present study found that higher BMI scores were associated with an increased likelihood of past month cigarette smoking, supporting study hypotheses. These findings are consistent with previous research showing that cigarette use is related to higher BMI among adults (Dvorak, Del Gaizo, Engdahl, & Eliason, 2009; Bamia, Trichopoulou, Lenas, & Trichopoulos, 2004) and that the risk for tobacco use dependence is increased for those who are overweight (Barry & Petry, 2009). This relationship may be particularly problematic given that weight gain is common among undergraduate students and cigarette use has been cited as a common weight management practice among those in this age group (Carroll et al., 2006; Zucker et al., 2001). Previous studies have also determined that tobacco users report poorer health and quality of life than non-smokers (Strine et al., 2005). It is possible then that those who use tobacco are more likely to have poorer health habits, leading to health compromising behaviors such as inactivity and poor dietary habits. For example, in their study of tobacco use and BMI, Dvorak et al (2009) determined tobacco use was not only related to higher BMI, but was also related to physical inactivity. This is an important finding given that nearly 35% of morbidity in the U.S. is related to tobacco use, physical inactivity, and poor diet (Mokdad, Marks, Stroup, & Gerberding, 2004). Given the risk for chronic disease and the potential for

dependence among tobacco users who are overweight or obese, future research should consider the role of BMI as a factor in decreasing tobacco use.

Contrary to study hypotheses, the present study did not find an association between BMI and marijuana use, alcohol use or binge drinking. However, this is similar to previous research in adults which found that marijuana use was not related to increases in BMI (Warren et al., 2005). As one of the side effects of marijuana use is appetite stimulation, marijuana may not be as appealing to an individual who is already overweight. Instead, they may be more likely to choose cigarettes, which are known to suppress the appetite. The non-significant association between BMI and alcohol use found in this study is also similar to previous research among overweight and obese adults. For example, Klein et al (2004) determined an inverse relationship between BMI and alcohol use among adult women with those who were more obese being less likely to consume alcohol (Kleiner et al., 2004). Though inconclusive, previous studies have also found the opposite relationship between BMI and alcohol for adult men (Wannamethee & Shaper, 2003).

Current study findings regarding alcohol use and BMI are surprising given that previous research has shown an association between alcohol use and weight gain among college students. For example, a qualitative study by Nelson et al (2009) determined that alcohol use can have an effect on weight-related behaviors including dietary intake (Nelson et al., 2009). Students reported eating more as a result of drinking, but also eating more before drinking as a way to consume more alcohol (Nelson et al., 2009).

Other research examining alcohol, eating patterns, and weight behaviors among college students determined that binge drinking was related to multiple weight-related behaviors including sedentary activities, infrequent breakfast consumption, and high fast food intake, all of which have shown to increase the risk for obesity (Nelson et al., 2009; Ford et al., 2005; Timlin et al., 2001; Duffey et al., 2007).

Overweight and obesity are caused by multiple factors, yet in a society that favors those who are normal weight or thin, blame is often placed on individuals and their behaviors. It is widely accepted in the U.S. that being thin is good and being overweight or obese is not (Evans, 2004). Those who are overweight and obese are then labeled as deviants because, physically, they are not following in line with social norms. If being overweight or obese is considered to be a non-normative or deviant behavior (Evans, 2004; Schafer & Ferraro, 2011), it may be likely that those who are overweight or obese will engage in other non-normative behaviors such as binge drinking or tobacco use. By using problem behavior theory as a conceptual framework, which suggests that problem behaviors tend to co-occur (Jessor & Jessor, 1977), the relationship between BMI and substance use warrants further exploration. Past research has confirmed the co-occurrence of risk behaviors or “problem behaviors” such as substance use and obesity-related behaviors in college students (Nelson Laska et al., 2009). If we expand problem behavior theory to include a wide range of behaviors that put an individual at risk, including lifestyle related behaviors, rather than just the traditional risk behaviors, we may be better able to identify those who are at increased risk for both future health problems resulting from obesity and substance use.

The ability to identify these individuals is imperative as interventions and prevention efforts focused on only one behavior are unlikely to be successful for individuals who engage in multiple health compromising behaviors. Although the only significant relationship between substance use behaviors and BMI was found for tobacco use, many substance use behaviors are initiated in adolescence and peak during the college years. It is also common for risk behaviors to co-occur among both adolescents (Pasch, Laska, Lytle, & Moe, 2010) and college students (Nelson Laska et al., 2009). Future research should continue to examine the development of substance use behaviors across time as well as relationship between BMI and tobacco use, while also including other substance use behaviors that frequently co-occur.

Limitations

This is the first study to my knowledge to examine the relationship between BMI and substance use behaviors among college students, however it has several limitations. First, the sample was limited only to college undergraduate students from one larger southwestern University, therefore reducing the generalizability of the findings to other populations. Future research is needed to explore the relationship between substance use behaviors and BMI in a more diverse sample. Second, the cross-sectional design does not allow for causal inferences to be made, therefore, it is not possible to determine whether substance use occurs before increases in BMI or if higher BMI occurs before substance use behaviors. Future studies are needed to determine the trajectory of BMI and substance use behaviors throughout the college years, as well a prior to college when

many of these behaviors begin. Third, many of the measures were based on single self-report items, which may limit the validity of study findings. However, despite these limitations, this study begins to document the associations between obesity and substance use behaviors among college undergraduates, an area lacking in attention in the current research.

Conclusions and Future Directions

Emerging adulthood is a time of significant change and instability. The risk of substance use and abuse increases substantially during this developmental period and can potentially lead to dependence disorders in the future. The most dramatic changes in overweight obesity are occurring among emerging adults as well, increasing their risk of developing serious health problems, including chronic disease. Given the association between BMI and cigarette use found in this study, it is important that future research challenge the traditional risk profile and include weight and weight related behaviors in prevention efforts aimed at reducing the risk of substance use. Weight changes have also been found to be more prevalent in early years of college compared to later and it is important to understand if there are differences in the relationship between BMI and substance use behaviors from freshman to senior year.

Appendix A: IRB Approval Letter



OFFICE OF RESEARCH SUPPORT

THE UNIVERSITY OF TEXAS AT AUSTIN

*P.O. Box 7426, Austin, Texas 78713 (512) 471-8871 -
FAX (512 471-8873) North Office Building A, Suite
5.200 (Mail code A3200)*

FWA # 00002030

Date: **03/10/11**

PI(s): **Keryn Elizabeth Pasch**
Whitney Jaye Lang

Department & Mail Code: **KINESIOLOGY & HEALTH-BEL**
KINESIOLOGY & HEALTH-BEL

Title: **Obesity and Substance Use among College Students: Does
Higher BMI Increase Risk?**

IRB EXEMPT DETERMINATION: IRB Protocol # **2011-01-0050**

Dear: **Keryn Elizabeth Pasch** **Whitney Jaye Lang**

Recognition of Exempt status based on 45CFR 46.101(b).

Qualifying Period: 03/10/2011 - 03/09/2014 *Expires 12 a.m. [midnight] of this date.*
A continuing review report must be submitted in three years if the research is ongoing.

- (4) Research involving the collection or study of existing data, documents, records, pathological specimens, or diagnostic specimens, if these sources are publicly available or if the information is recorded by the investigator in such a manner that subjects cannot be identified, directly or through identifiers linked to the subjects.

Responsibilities of the Principal Investigator:

Research that is determined to be Exempt from Institutional Review Board (IRB) review is not exempt from ensuring protection of human subjects. The following criteria to protect human subjects must be met. The Principal Investigator (PI):

1. Assures that all investigators and co-principal investigators are trained in the ethical principles, relevant Federal Regulations and institutional policies governing human subject research.
2. Will provide subjects with pertinent information (e.g. risks and benefits, contact information for investigators and IRB Chair) and assures that human subjects will voluntarily consent to participate in the research when appropriate (e.g. surveys, interviews).
3. Assures the subjects will be selected equitably, so that the risks and benefits of the research are justly distributed.
4. Assures that the IRB will be immediately informed of any information or unanticipated problems that may increase the risk to the subjects and cause the category of review to be reclassified to Expedited or Full Board Review.

IRB APPROVAL – IRB Protocol # 2011-01-0050

5. Assures that the IRB will be immediately informed of any complaints from subjects regarding their risks and benefits.
6. Assures that confidentiality and privacy of the subjects and the research data will be maintained appropriately to ensure minimal risk to subjects.
7. Will report, by amendment, any changes in the research study.

These criteria are specified in the PI Assurance Statement that must be signed before determination of Exempt status will be granted. The PI's signature acknowledges that he/she understands and accepts these conditions. Refer to the Office of Research Support (ORS) website, www.utexas.edu/irb for specific information on training, voluntary informed consent, privacy, and how to notify the IRB of unanticipated problems.

1. **Closure:** Upon completion of the research study, a Closure Report must be submitted to the ORS.
2. **Unanticipated Problems:** Any unanticipated problems or complaints must be reported to the IRB/ORS immediately. For a description of unanticipated problems, please refer to the ORS webpage: <http://www.utexas.edu/research/rsc/humansubjects/policies/section7.html#7.3>
3. **Informed Consent:** The informed consent procedures laid out within your research proposal must be followed.
4. **Continuing Review:** If the study will continue beyond the three year qualifying period, a continuing review report must be filed.
5. **Amendments:** Amendments do not need to be filed with the ORS if the amendments do not change the risk level of the study (for example: increasing sample size, adding or removing co-

Principal Investigators, adding or removing research sites, or minor modifications to the research protocol). Changes altering the level of risk to subjects must be requested by submitting an amendment application and revised proposal to the ORS prior to those changes being implemented. For a description of the types of modifications that require an amendment application, refer to the ORS webpage: <http://www.utexas.edu/research/rsc/humansubjects/policies/section6.html#635b> , or call 471- 8871.

If you have any questions call or contact the ORS (Mail Code A3200) or via e-mail at orsc@uts.cc.utexas.edu.

Sincerely,

A handwritten signature in black ink, appearing to read "Jody L. Jensen". The signature is fluid and cursive, with the first name "Jody" being the most prominent.

Jody L. Jensen, Ph.D.
Professor
Chair, Institutional Review Board

Appendix B: NCHA Survey



Instructions:

The following questions ask about various aspects of your health.

To answer the questions, fill in the oval that corresponds to your response.

Select only one response unless instructed otherwise.

Use a No. 2 pencil or blue or black ink pen only. Do not use pens with ink that soaks through the paper. CORRECT: ● INCORRECT: ✗ ☹️ 🚫

This survey is completely voluntary. You may choose not to participate or not to answer any specific question. You may skip any question you are not comfortable in answering.

Please make no marks of any kind on the survey which could identify you individually.

Composite data will then be shared with your campus for use in health promotion activities.

*Thank you for taking the time and
thought to complete this survey.
We appreciate your participation!*



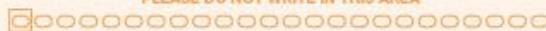
American College Health Association

National College Health Assessment

Copyright © 2009 American College Health Association

PAGE ONE

PLEASE DO NOT WRITE IN THIS AREA



SERIAL #

Health, Health Education and Safety

1. How would you describe your general health?

- Excellent
 Very good
 Good
 Fair
 Poor
 Don't know

2. Have you received information on the following topics from your college or university?

3. Are you interested in receiving information on the following topics from your college or university?

(Please mark the appropriate column for each question to the right)

	No	Yes	No	Yes
Alcohol and other drug use	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cold/Flu/Sore throat	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Depression/Anxiety	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Eating disorders	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Grief and loss	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
How to help others in distress	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Injury prevention	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Nutrition	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Physical activity	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Pregnancy prevention	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Problem use of Internet/computer games	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Relationship difficulties	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sexual assault/Relationship violence prevention	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sexually transmitted disease/infection (STD/I) prevention	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sleep difficulties	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Stress reduction	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Suicide prevention	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Tobacco use	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Violence prevention	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

4. Within the last 12 months, how often did you:

(Please mark the appropriate column for each row)

- Always
 Most of the time
 Sometimes
 Rarely
 Never
 N/A, did not do this activity within the last 12 months

	Always	Most of the time	Sometimes	Rarely	Never	N/A, did not do this activity within the last 12 months
Wear a seatbelt when you rode in a car?	<input type="radio"/>					
Wear a helmet when you rode a bicycle?	<input type="radio"/>					
Wear a helmet when you rode a motorcycle?	<input type="radio"/>					
Wear a helmet when you were inline skating?	<input type="radio"/>					

5. Within the last 12 months:

(Please mark the appropriate column for each row)

	Yes	No
Were you in a physical fight?	<input type="radio"/>	<input type="radio"/>
Were you physically assaulted (do not include sexual assault)?	<input type="radio"/>	<input type="radio"/>
Were you verbally threatened?	<input type="radio"/>	<input type="radio"/>
Were you sexually touched without your consent?	<input type="radio"/>	<input type="radio"/>
Was sexual penetration attempted (vaginal, anal, oral) without your consent?	<input type="radio"/>	<input type="radio"/>
Were you sexually penetrated (vaginal, anal, oral) without your consent?	<input type="radio"/>	<input type="radio"/>
Were you a victim of stalking (e.g., waiting for you outside your classroom, residence, or office; repeated emails/phone calls)?	<input type="radio"/>	<input type="radio"/>

6. Within the last 12 months, have you been in an intimate (coupled/partnered) relationship that was:
 (Please mark the appropriate column for each row)

	Yes	No
Emotionally abusive? (e.g., called derogatory names, yelled at, ridiculed)	<input type="radio"/>	<input type="radio"/>
Physically abusive? (e.g., kicked, slapped, punched)	<input type="radio"/>	<input type="radio"/>
Sexually abusive? (e.g., forced to have sex when you didn't want it, forced to perform or have an unwanted sexual act performed on you)	<input type="radio"/>	<input type="radio"/>

7. How safe do you feel:
 (Please mark the appropriate column for each row)

	Very safe	Somewhat safe	Somewhat unsafe	Not safe at all
On this campus (daytime)?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
On this campus (nighttime)?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In the community surrounding this school (daytime)?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In the community surrounding this school (nighttime)?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Alcohol, Tobacco, and Drugs

8. Within the last 30 days, on how many days did you use:
 (Please mark the appropriate column for each row)

	Have used, but not in last 30 days	Never used	3-5 days	1-2 days	6-9 days	10-19 days	20-29 days	Used daily
Cigarettes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Tobacco from a water pipe (hookah)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cigars, little cigars, clove cigarettes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Smokeless tobacco	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Alcohol (beer, wine, liquor)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Marijuana (pot, weed, hashish, hash oil)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cocaine (crack, rock, freebase)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Methamphetamine (crystal meth, ice, crank)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other amphetamines (diet pills, bennies)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sedatives (downers, ludes)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Hallucinogens (LSD, PCP)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Anabolic steroids (Testosterone)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Opiates (heroin, smack)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Inhalants (glue, solvents, gas)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
MDMA (Ecstasy)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other club drugs (GHB, Ketamine, Rohypnol)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other illegal drugs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

PAGE THREE

PLEASE DO NOT WRITE IN THIS AREA



SERIAL #

9. Within the last 30 days, how often do you think the typical student at your school used:

(State your best estimate; Please mark the appropriate column for each row)

	Have used, but not in last 30 days		3-5 days	6-9 days
	Never used	1-2 days	10-19 days	20-29 days Used daily
Cigarettes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Tobacco from a water pipe (hookah)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cigars, little cigars, clove cigarettes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Smokeless tobacco	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Alcohol (beer, wine, liquor)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Marijuana (pot, weed, hashish, hash oil)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cocaine (crack, rock, freebase)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Methamphetamine (crystal meth, ice, crank)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other amphetamines (diet pills, bennies)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sedatives (downers, ludes)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Hallucinogens (LSD, PCP)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Anabolic steroids (Testosterone)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Opiates (heroin, smack)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Inhalants (glue, solvents, gas)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
MDMA (Ecstasy)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other club drugs (GHB, Ketamine, Rohypnol)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other illegal drugs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

One drink of alcohol is defined as a 12 oz. can or bottle of beer or wine cooler, a 4 oz. glass of wine, or a shot of liquor straight or in a mixed drink.

10. The last time you "partied"/socialized how many drinks of alcohol did you have? (If you did not drink alcohol, please enter 00. If less than 10, enter 01, 02, 03, etc.)

D	<input type="radio"/>
R	<input type="radio"/>
I	<input type="radio"/>
N	<input type="radio"/>
K	<input type="radio"/>
S	<input type="radio"/>
	<input type="radio"/>

11. The last time you "partied"/socialized over how many hours did you drink alcohol? (If you did not drink alcohol, please enter 00. If less than 10, enter 01, 02, 03, etc.)

H	<input type="radio"/>
O	<input type="radio"/>
U	<input type="radio"/>
R	<input type="radio"/>
S	<input type="radio"/>
	<input type="radio"/>

12. How many drinks of alcohol do you think the typical student at your school had the last time he/she "partied"/socialized? (If you think the typical student at your school does not drink alcohol, please enter 00. If less than 10, enter 01, 02, 03, etc.)

D	<input type="radio"/>
R	<input type="radio"/>
I	<input type="radio"/>
N	<input type="radio"/>
K	<input type="radio"/>
S	<input type="radio"/>
	<input type="radio"/>

13. Over the last two weeks, how many times have you had five or more drinks of alcohol at a sitting?

- N/A, don't drink
- 2 times
- 5 times
- 8 times
- None
- 3 times
- 6 times
- 9 times
- 1 time
- 4 times
- 7 times
- 10 or more times

14. Within the last 30 days, did you:

(Please mark the appropriate column for each row)

	Yes	No
Drive after drinking any alcohol at all	<input type="radio"/>	<input type="radio"/>
Drive after drinking five or more drinks of alcohol	<input type="radio"/>	<input type="radio"/>

Sex Behavior and Contraception

19. Within the last 12 months, with 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.)

P	
A	01
R	02
T	03
N	04
E	05
R	06
S	07
	08
	09
	10

20. Within last 12 months, did you have sexual partner(s) who were:

(Please mark the appropriate column for each row)

	Yes	No
Female	<input type="checkbox"/>	<input type="checkbox"/>
Male	<input type="checkbox"/>	<input type="checkbox"/>
Transgender	<input type="checkbox"/>	<input type="checkbox"/>

21. Within the last 30 days, did you have:

(Please mark the appropriate column for each row)

	Yes	No, have done this sexual activity in the past but not in the last 30 days	No, have never done this sexual activity
Oral sex?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Vaginal intercourse?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Anal intercourse?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

22. 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:

(Please mark the appropriate column for each row)

	Have not done this sexual activity during the last 30 days	Never	Rarely	Sometimes	Most of the time	Always	CONDOM/BARRIER USE
Oral sex?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Vaginal intercourse?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Anal intercourse?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

23A. Did you or your partner use a method of birth control to prevent pregnancy the last time you had vaginal intercourse?

- Yes (continue to item 23B)
- N/A, have not had vaginal intercourse (skip to item 24)
- No, have not had vaginal intercourse that could result in a pregnancy (skip to item 24)
- No, did not want to prevent pregnancy (skip to item 24)
- No, did not use any birth control method (skip to item 24)
- Don't know (skip to item 24)

23B. Please indicate whether or not you or your partner used each of the following methods of birth control to prevent pregnancy the last time you had vaginal intercourse. (Please mark the appropriate column for each row)

	Yes	No		Yes	No
Birth control pills (monthly or extended cycle)	<input type="checkbox"/>	<input type="checkbox"/>	Diaphragm or cervical cap	<input type="checkbox"/>	<input type="checkbox"/>
Birth control shots	<input type="checkbox"/>	<input type="checkbox"/>	Contraceptive sponge	<input type="checkbox"/>	<input type="checkbox"/>
Birth control implants	<input type="checkbox"/>	<input type="checkbox"/>	Spermicide (e.g., foam, jelly, cream)	<input type="checkbox"/>	<input type="checkbox"/>
Birth control patch	<input type="checkbox"/>	<input type="checkbox"/>	Fertility awareness (e.g., calendar, mucous, basal body temperature)	<input type="checkbox"/>	<input type="checkbox"/>
Vaginal ring	<input type="checkbox"/>	<input type="checkbox"/>	Withdrawal	<input type="checkbox"/>	<input type="checkbox"/>
Intrauterine device (IUD)	<input type="checkbox"/>	<input type="checkbox"/>	Sterilization (e.g., hysterectomy, tubes tied, or vasectomy)	<input type="checkbox"/>	<input type="checkbox"/>
Male condom	<input type="checkbox"/>	<input type="checkbox"/>	Other method	<input type="checkbox"/>	<input type="checkbox"/>
Female condom	<input type="checkbox"/>	<input type="checkbox"/>			

24. Within the last 12 months, have you or your partner(s) used emergency contraception ("morning after pill")?

- N/A, have not had vaginal intercourse in the last 12 months
- No
- Yes
- Don't know

25. Within the last 12 months, have you or your partner(s) become pregnant?

- N/A, have not had vaginal intercourse in the last 12 months
- No
- Yes, unintentionally
- Yes, intentionally
- Don't know

Weight, Nutrition, and Exercise

26. How do you describe your weight?

- Very underweight
- Slightly underweight
- About the right weight
- Slightly overweight
- Very overweight

27. Are you trying to do any of the following about your weight?

- I am not trying to do anything about my weight
- Stay the same weight
- Lose weight
- Gain weight

28. How many servings of fruits and vegetables do you usually have per day?

(1 serving = 1 medium piece of fruit; 1/2 cup fresh, frozen, or canned fruits/vegetables; 3/4 cup fruit/vegetable juice; 1 cup salad greens; or 1/4 cup dried fruit)

- 0 servings per day
- 1-2 servings per day
- 3-4 servings per day
- 5 or more servings per day

29. On how many of the past 7 days did you:

(Please mark the appropriate column for each row)

	0 days	1 day	2 days	3 days	4 days	5 days	6 days	7 days
Do moderate-intensity cardio or aerobic exercise (caused a noticeable increase in heart rate, such as a brisk walk) for at least 30 minutes?	<input type="radio"/>							
Do vigorous-intensity cardio or aerobic exercise (caused large increases in breathing or heart rate, such as jogging) for at least 20 minutes?	<input type="radio"/>							
Do 8-10 strength training exercises (such as resistance weight machines) for 8-12 repetitions each?	<input type="radio"/>							

Mental Health

30. Have you ever:

(Please mark the appropriate column for each row)

	No, not in last 12 months	Yes, in the last 2 weeks	Yes, in the last 30 days	Yes, in the last 12 months
Felt things were hopeless	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Felt overwhelmed by all you had to do	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Felt exhausted (not from physical activity)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Felt very lonely	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Felt very sad	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Felt so depressed that it was difficult to function	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Felt overwhelming anxiety	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Felt overwhelming anger	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Intentionally cut, burned, bruised, or otherwise injured yourself	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Seriously considered suicide	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Attempted suicide	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

35. Have you ever received psychological or mental health services from your current college/university's Counseling or Health Service?
 No Yes

36. If in the future you were having a personal problem that was really bothering you, would you consider seeking help from a mental health professional?
 No Yes

37. Within the last 12 months, how would you rate the overall level of stress you have experienced?
 No stress
 Less than average stress
 Average stress
 More than average stress
 Tremendous stress

Physical Health

38. Within the last 30 days, did you do any of the following?
 (Please mark the appropriate column for each row)

	Yes	No
Exercise to lose weight	<input type="radio"/>	<input type="radio"/>
Diet to lose weight	<input type="radio"/>	<input type="radio"/>
Vomit or take laxatives to lose weight	<input type="radio"/>	<input type="radio"/>
Take diet pills to lose weight	<input type="radio"/>	<input type="radio"/>

39. Have you:
 (Please mark the appropriate column for each row)

	Don't know	Yes	No
Had a dental exam and cleaning in the last 12 months?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
(Males) Performed testicular self exam in the last 30 days?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
(Females) Performed breast self exam in the last 30 days?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
(Females) Had a routine gynecological exam in the last 12 months?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Used sunscreen regularly with sun exposure?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ever been tested for Human Immunodeficiency Virus (HIV) infection?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

40. Have you received the following vaccinations (shots)?
 (Please mark the appropriate column for each row)

	Don't know	Yes	No
Hepatitis B	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Human Papillomavirus/HPV (cervical cancer vaccine)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Influenza (the flu) in the last 12 months (shot or nasal mist)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Measles, Mumps, Rubella	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Meningococcal disease (meningococcal meningitis)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Varicella (chicken pox)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Impediments to Academic Performance

(Please select the most serious outcome for each item below)

- Significant disruption in thesis, dissertation, research, or practicum work
- Received an incomplete or dropped the course
- Received a lower grade in the course
- Received a lower grade on an exam or important project
- I have experienced this issue but my academics have not been affected
- This did not happen to me/not applicable

45. Within the last 12 months, have any of the following affected your academic performance?

Alcohol use	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Allergies	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Anxiety	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Assault (physical)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Assault (sexual)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Attention Deficit and Hyperactivity Disorder (ADHD)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cold/Flu/Sore throat	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Concern for a troubled friend or family member	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Chronic health problem or serious illness (e.g., diabetes, asthma, cancer)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Chronic pain	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Death of a friend or family member	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Depression	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Discrimination (e.g., homophobia, racism, sexism)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Drug use	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Eating disorder/problem	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Finances	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Gambling	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Homesickness	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Injury (fracture, sprain, strain, cut)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Internet use/computer games	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Learning disability	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Participation in extracurricular activities (e.g., campus clubs, organizations, athletics)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Pregnancy (yours or your partner's)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Relationship difficulties	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Roommate difficulties	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sexually transmitted disease/infection (STM)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sinus infection/Ear infection/Bronchitis/Strep throat	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sleep difficulties	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Stress	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Work	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other (please specify _____)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Demographic Characteristics

46. How old are you? →

Years		
-------	--	--

47. What is your gender?

Female

--	--

Male

--	--

Transgender

--	--

48. What is your sexual orientation?

Heterosexual

--	--

Gay/Lesbian

--	--

Bisexual

--	--

Unsure

--	--

49. What is your height in feet and inches? →

Ft	Inch
HEIGHT	
1	<input type="radio"/>
2	<input type="radio"/>
3	<input type="radio"/>
4	<input type="radio"/>
5	<input type="radio"/>
6	<input type="radio"/>
7	<input type="radio"/>
8	<input type="radio"/>
9	<input type="radio"/>

50. What is your weight in pounds? →

Pounds	
WEIGHT	
100	<input type="radio"/>
110	<input type="radio"/>
120	<input type="radio"/>
130	<input type="radio"/>
140	<input type="radio"/>
150	<input type="radio"/>
160	<input type="radio"/>
170	<input type="radio"/>
180	<input type="radio"/>
190	<input type="radio"/>

51. What is your year in school?
- 1st year undergraduate
 - 2nd year undergraduate
 - 3rd year undergraduate
 - 4th year undergraduate
 - 5th year or more undergraduate
 - Graduate or professional
 - Not seeking a degree
 - Other
52. What is your enrollment status?
- Full-time
 - Part-time
 - Other
53. Have you transferred to this college or university within the last 12 months?
- No
 - Yes
54. How do you usually describe yourself?
(Mark all that apply)
- White, non Hispanic (includes Middle Eastern)
 - Black, non Hispanic
 - Hispanic or Latino/a
 - Asian or Pacific Islander
 - American Indian, Alaskan Native, or Native Hawaiian
 - Biracial or Multiracial
 - Other
55. Are you an international student?
- No
 - Yes
56. What is your relationship status?
- Not in a relationship
 - In a relationship but not living together
 - In a relationship and living together
57. What is your marital status?
- Single
 - Divorced
 - Married/Partnered
 - Other
 - Separated
58. Where do you currently live?
- Campus residence hall
 - Fraternity or sorority house
 - Other college/university housing
 - Parent/guardian's home
 - Other off-campus housing
 - Other
59. Are you a member of a social fraternity or sorority?
(e.g., National Interfraternity Conference, National Panhellenic Conference, National Pan-Hellenic Council, National Association of Latino Fraternal Organizations)
- No
 - Yes

60. How many hours a week do you work for pay?
- 0 hours
 - 1-9 hours
 - 10-19 hours
 - 20-29 hours
 - 30-39 hours
 - 40 hours
 - More than 40 hours
61. How many hours a week do you volunteer?
- 0 hours
 - 1-9 hours
 - 10-19 hours
 - 20-29 hours
 - 30-39 hours
 - 40 hours
 - More than 40 hours
62. What is your primary source of health insurance?
- My college/university sponsored plan
 - My parents' plan
 - Another plan
 - I don't have health insurance
 - I am not sure if I have health insurance
63. What is your approximate cumulative grade average?
- A
 - B
 - C
 - D/F
 - N/A
64. Within the last 12 months, have you participated in organized college athletics at any of the following levels?
- (Please mark the appropriate column for each row)
- | | Yes | No |
|-------------|-----------------------|-----------------------|
| Varsity | <input type="radio"/> | <input type="radio"/> |
| Club sports | <input type="radio"/> | <input type="radio"/> |
| Intramurals | <input type="radio"/> | <input type="radio"/> |
65. Do you have any of the following disabilities or medical conditions?
- (Please mark the appropriate column for each row)
- | | Yes | No |
|---|-----------------------|-----------------------|
| Attention Deficit and Hyperactivity Disorder (ADHD) | <input type="radio"/> | <input type="radio"/> |
| Chronic illness (e.g., cancer, diabetes, auto-immune disorders) | <input type="radio"/> | <input type="radio"/> |
| Deaf/Hard of hearing | <input type="radio"/> | <input type="radio"/> |
| Learning disability | <input type="radio"/> | <input type="radio"/> |
| Mobility/Dexterity disability | <input type="radio"/> | <input type="radio"/> |
| Partially sighted/Blind | <input type="radio"/> | <input type="radio"/> |
| Psychiatric condition | <input type="radio"/> | <input type="radio"/> |
| Speech or language disorder | <input type="radio"/> | <input type="radio"/> |
| Other disability | <input type="radio"/> | <input type="radio"/> |

THANK YOU FOR COMPLETING THIS SURVEY

PAGE TWELVE

PLEASE DO NOT WRITE IN THIS AREA



SERIAL #

References

- Abbey, A., Zawacki, T., Buck, P., Clinton, A.M., & McAuslan, P. (2004). Sexual assault and alcohol consumption: What do we know about their relationship and what types of research are still needed? *Aggression and Violent Behavior, 9*, 271-303.
- Abbey, A.; Zawacki, T.; Buck, P.O.; et al. (2001). Alcohol and sexual assault. *Alcohol Research & Health, 25*(1), 43-51.
- Adams, T. & Rini, A. (2007). Predicting 1-year change in body mass index among college students. *Journal of American College Health, 55*(6), 361-365.
- American College Health Association. (2010). *American College Health Association-National College Health Assessment II: Reference group executive summary spring 2010*. Linthicum, MD: American College Health Association.
- American College Health Association. (2009). *American College Health Association-National College Health Assessment II: Reference Group Executive Summary Fall 2009*. Linthicum, MD: American College Health Association.
- American College Health Association. (2008). American College Health Association-National College Health Assessment spring 2007 reference group data report (abridged). *Journal of American College Health, 56*, 469-79. doi: 10.3200/JACH.56.5.469-480.
- Arnett, J.J. (1998a). Learning to stand alone: The contemporary American transition to adulthood in cultural and historical context. *Human Development, 41*, 295-315.

- Arnett, J.J. (1998b). Risk behavior and family role transitions during the twenties. *Journal of Youth & Adolescence*, 27, 301-320
- Arnett, J.J. (2000). Emerging adulthood: A theory of development from the late teens through the twenties. *American Psychologist*, 55,469-480.
- Arnett, J.J. (2004). *Emerging adulthood: The winding road from the late teens through the twenties*. New York: Oxford University Press.
- Arnett, J.J. (2005). The developmental context of substance use in emerging adulthood. *Journal of Drug Issues*, 35, 235-254.
- Aud, S., Hussar, W., Planty, M., Snyder, T., Bianco, K., Fox, M., Frohlich, L., Kemp, J., & Drake, L. (2010). *The Condition of Education 2010* (NCES 2010-028). National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education. Washington, DC.
- Baan, R.K., Straif, Y., Grosse, B., Secretan, F., El Ghassassi, V., Bouvard, A., Altieri, V., & Cogliano, on behalf of the WHO International Agency for Research on Cancer Monograph Working Group. (2007). Carcinogenicity of Alcoholic Beverages. *The Lancet Oncology*, 8, 292- 293.
- Barry, D. & Petry, N.M. (2009). Associations between body mass index and substance use disorders differ by gender: Results from the National Epidemiologic Survey on Alcohol and Related Conditions. *Addictive Behaviors*, 34, 51-60.

- Burke, G.L., Bild, D.E., Hilner, J.E., Folsom, A.R., Wagenknecht, L.E., & Sidney, S. (1996). Differences in weight gain in relation to race, gender, age and education in young adults: the CARDIA Study. *Coronary Artery Risk Development in Young Adults. Ethnicity and Health, 1*, 327-335.
- Butler, S.M., Black, D.R., Blue, C.L., & Greteback, R.J. (2004). Change in diet, physical activity, and body weight in female college freshman. *American Journal of Health Behavior, 28*, 24–32.
- Caldeira, K.M., Arria, A.M., O'Grady, K.E., Vincent, K.B., & Wish, E.D. (2008). The occurrence of cannabis use disorders and other cannabis-related problems among first-year college students. *Addictive Behavior, 33*(3), 397–411.
- Carroll, S.L., Lee, R.L., Kaur, H., Harris, K.J., Strother, M.L., & Huang, T.T.-K. (2006). Smoking, weight loss intention and obesity-promoting behaviors in college students. *Journal of the American College of Nutrition, 25*(4), 348-353.
- Cawley, J., Markowitz, S., & Tauras, J. (2004). Lighting up and slimming down: The effects of body weight and cigarette prices on adolescent smoking initiation. *Journal of Health Economics, 23*, 293–311.
- Centers for Disease Control and Prevention. (2010). Vital signs: Current cigarette smoking among adults aged ≥ 18 years—United States, 2009. *Morbidity and Mortality Weekly Report, 59*(35), 1135-1140.

Centers for Disease Control and Prevention. (2010). *Vital signs: Binge drinking*. Office of Surveillance, Epidemiology and Laboratory Services (OSELS), Centers for Disease Control and Prevention, Atlanta, GA: US.

Centers for Disease Control and Prevention. (2009). Cigarette smoking among adults and trends in smoking cessation, United States, 2008. *Morbidity and Mortality Weekly Report*, 58(44), 1227-1232.

Centers for Disease Control and Prevention. (2001). Alcohol-attributable deaths and years of potential life lost, United States. *Morbidity Mortality Weekly Report*, 53, 866–870.

Corrao G, Bagnardi V, Zambon A, La Vecchia C. (2004). A meta-analysis of alcohol consumption and the risk of 15 diseases. *Preventative Medicine*, 38, 613–619.

Corrao G, Rubbiati L, Zambon A, Arico S. (2002). Alcohol-attributable and alcohol-preventable mortality in Italy: A balance in 1983 and 1996. *European Journal of Public Health*, 12, 214–223.

Dawson, D.A., Grant, B.F., Stinson, F.S., & Chou, P.S. (2004). Another look at heavy episodic drinking and alcohol use disorders among college and noncollege youth. *Journal of Studies on Alcohol*, 65(4), 477-488.

Delinsky, S.S. & Wilson, G.T. (2008). Weight gain, dietary restraint, and disordered eating in the freshman year of college. *Eating Behavior*, 9, 82–90.

Department of Transportation (US), National Highway Traffic Safety Administration (NHTSA). (2009). *Traffic safety facts 2008: Alcohol-impaired driving*. Washington (DC): NHTSA.

Desai, M.N., Miller, W.C., Staples, B., & Bravender, T. (2008). Risk factors associated with overweight and obesity in college students. *Journal of American College Health*, 57(1), 109-114.

Duistman, D.M. & Colbry, S.L. (1995). Perceived risk and use as predictors of substance use among college students. *Health Values: The Journal of Health Behavior, Education & Promotion*, 19(2), 44-52.

Dusselier, L., Dunn, B., Wang, Y., Shelley, M.C., & Whalen, D.F. (2005). Personal, health, academic, and environmental predictors of stress for residence hall students. *Journal of American College Health*, 54(1), 15-24.

Evans, B. (2004). Be fit not fat: Broadening the childhood obesity debate beyond dualisms. *Children's Geographies*, 2(2), 289–291.

Federal Bureau of Investigation. (2008). *Uniform Crime Reports*, Washington, DC. Available at URL: <http://www.fbi.gov/ucr/ucr.htm>.

Finkelstein, E.A., Trogden, J.G., Cohen, J.W., & Dietz, W. (2009). Annual medical spending attributable to obesity: Payer and service-specific estimates. *Health Affairs*, 28(w), 822-831.

- Flegal, K.M., Carroll, M.D., Ogden, C.L., & Curtin, L.R. (2010). Prevalence and trends in obesity among US adults, 1999-2008. *Journal of the American Medical Association, 303*(3), 235-241.
- Galston, W. (2007). *Being 20-something in the 21st century*. Retrieved March 4, 2011, from http://www.brookings.edu/speeches/2007/1004useconomics_galston.aspx.
- Gledhill-Hoyt, J., Lee, H., Strote, J., & Wechsler, H. (2000). Increased use of marijuana and other illicit drugs at U.S. colleges in the 1990s: Results of three national surveys, *Addiction, 95*(11), 1655–1667.
- Gordon-Larsen, P., The, N.S., & Adair, L.S. (2010). Longitudinal trends in obesity in the United States from adolescence to the third decade of life. *Obesity, 18*(9), 1801-1804.
- Grant B. (1998). Age at smoking onset and its association with alcohol consumption and DSM-IV alcohol abuse and dependence: Results from the national longitudinal alcohol epidemiologic survey. *Journal of Substance Abuse, 10*, 59 –73.
- Grubbs, L. & Carter, J. (2002). The relationship of perceived benefits and barriers to reported exercise behaviors in college undergraduates. *Family & Community Health, 17*(14), 76-84.
- Hall, W. & Degenhardt, L. (2009). Adverse health effects of non-medical cannabis use. *The Lancet, 374*(9698), 1383-1391.

- Hall, W., Degenhardt, L. & Lynskey, M. (2001) *The Health and Psychological Effects of Cannabis Use*. Monograph Series, 44. Sydney: National Drug and Alcohol Research Centre, University of New South Wales.
- Harvard School of Public Health. (2003). Obesity as a public health issue: a look at solutions. Report on a national poll conducted by Lake, Snell, and Perry. *Harvard Forums on Health*. Cambridge MA: Harvard School of Public Health.
- Heron, MP. (2007). Deaths: Leading causes for 2004. *National vital statistics reports*. Hyattsville, MD: National Center for Health Statistics. Available at URL: http://www.cdc.gov/nchs/data/nvsr/nvsr56/nvsr56_05.pdf
- Hines, D., Fretz, A. C., & Nollen, N. L. (1998). Regular and occasional smoking by college students: Personality attributions of smokers and nonsmokers. *Psychological Reports*, 83, 1299–1306.
- Hingson, R.W., Heeren, T., Zakocs, R., Kopstein, A., & Wechsler, H. (2002). Magnitude of alcohol-related mortality and morbidity among U.S. college students ages 18–24. *Journal of Studies on Alcohol and Drugs*, 14, 136–144.
- Hoffman, D.J., Policastro, P., Quick, V., & Lee, S.K. (2006). Changes in body weight and fat mass of men and women in the first year of college: A study of the “freshman 15”. *Journal of American College Health*, 55, 41-45.
- Johnston, L. D., O'Malley, P. M., Bachman, J. G., & Schulenberg, J. E. (2005). *Monitoring the future national survey results on drug use, 1975–2004: Volume II*,

college students and adults ages 19–40. NIH publication, Vol. 05-5728. Bethesda, MD: National Institute on Drug Abuse.

Jung, M.E., Bray, S.R., & Martin Ginis, K.A. (2008). Behavior change and the freshman 15: Tracking physical activity and dietary patterns in 1st-year university women. *Journal of American College Health, 56*, 523–30. doi: 10.3200/JACH.56.5.523-530.

Kapinos, K.A. & Yakusheva, O. (2011). Environmental influences on young adult weight gain: Evidence from a natural experiment. *Journal of Adolescent Health, 48*, 52-58.

Kasperek, D.G., Corwin, S.J., Valois, R.F., Sargent, R.G., & Morris, R.L. (2008). Selected health behaviors that influence college freshman weight change. *Journal of American College Health, 56*, 437-444. doi: 10.3200/JACH.56.44.437-444.

Kleiner, K.D., Gold, M.S., Frost-Pineda, K., Lenz-Brunzman, B., Perri, M.G., & Jabocs, W.S. (2004). Body mass index and alcohol use. *Journal of Addictive Diseases, 23*, 105-118.

Leslie, E., Sparling, P.B., & Owen, N. (2001). University campus settings and the promotion of physical activity in young adults: lessons from research in Australia and the USA. *Health Education, 101*, 116-125.

Krantz, D.S. (1978). The social context of obesity research: Another perspective on its place in the field of social psychology. *Personality and Social Psychology Bulletin, 4*(1), 177-184.

- Knight, J.R., Wechsler, H., Kuo, M., Seibring, M., Weitzman, E.R., & Schuckit, M. (2002). Alcohol abuse and dependence among U.S. college students. *Journal of Studies on Alcohol*, in press.
- Levitsky, D.A., Halbmaier, C.A., & Mrdjenovic, G. (2004). The freshman weight gain: A model for the study of the epidemic of obesity. *International Journal of Obesity and Related Metabolic Disorders*, 28, 1435-1442. doi: 10.1038/sj.ijo.0802776.
- Longo, M.C., Hunter, C.E., Lokan, R.J., White, J.M. & White, M.A. (2000). The prevalence of alcohol, cannabinoids, benzodiazepines and stimulants among injured drivers and their role in driver culpability. Part II: The relationship between drug prevalence and drug concentration, and driver culpability. *Accident Analysis and Prevention*, 32, 623–632.
- Lowry, R., Galuska, D.A., Fulton, J.E., Wechsler, H., & Kann, L. (2002). Weight management goals and practices among U.S. high school students: Associations with physical activity, diet, and smoking. *Journal of Adolescent Health*, 31,133–44.
- Magid, V., Colder, C.R., Stroud, L.R., Nichter, M., Nichter, M., & TERN. (2009). Negative affect, stress, and smoking in college students: Unique associations independent of alcohol and marijuana use. *Addictive Behaviors*, 34, 973-975.
- Matvienko, O., Lewis, D.S., & Schafer, E. (2001). A college nutrition science course as an intervention to prevent weight gain in female college freshmen. *Journal of Nutrition Education*, 33, 95–101. doi: 10.1016/S1499-4046(06)60172-3.

- McKee, S.A., Hinson, R., Rounsaville, D., & Petrelli, P. (2004). Survey of subjective effects of smoking while drinking among college students. *Nicotine & Tobacco Research, 6*, 111–117.
- Mihalopoulos, N.L., Auinger, P., & Klein, J.D. (2008). The freshman 15: is it real? *Journal of American College Health, 56*, 531–533.
- Mokdad, A.H., Marks, J.S., Stroup, D.F., & Gerberding, J.L. (2004). Actual causes of death in the United States, 2000. *Journal of the American Medical Association, 291*(10), 1238-1245.
- Mokdad, A.H., Serdula, M.K., Dietz, W.H., Bowman, B.A., Marks, J.S., & Koplan, J.P. (1999). The spread of the obesity epidemic in the United States. *Journal of the American Medical Association, 282*, 1519–1522.
- Moore, B.A., Augustson, E.M., Moser, R.P., & Budney, A.J. (2005). Respiratory effects of marijuana and tobacco use in a U.S. sample. *Journal of General Internal Medicine, 20*(1), 33-37.
- Movig, K.L., Mathijssen, M.P., Nagel, P.H., van Egmond, T., de Gier, J.J., Leufkens, H.G. *et al.* (2004) Psychoactive substance use and the risk of motor vehicle accidents. *Accident Analysis and Prevention, 34*, 631–636.
- Naimi, T.S., Brewer, R.D., Mokdad, A., Clark, D., Serdula, M.K., & Marks, J.S. (2003). Binge drinking among US adults. *Journal of the American Medical Association, 289*(1), 70–75.

- National Institute of Alcohol Abuse and Alcoholism. (2004). NIAAA council approves definition of binge drinking. *NIAAA Newsletter*, 3, 3. Available at:
http://pubs.niaaa.nih.gov/publications/Newsletter/winter2004/Newsletter_Number3.pdf
- Naquin, M.R., & Gilbert, G.G. (1996). College students' smoking behavior, perceived stress, and coping styles. *Journal of Drug Education*, 26, 367–376.
- Nelson, M.C., Kocos, R., Lytle, L.A., & Perry, C.L. (2009). Understanding the perceived determinants of weight-related behaviors in late-adolescence: A qualitative analysis among college youth. *Journal of Nutrition, Education, & Behavior*, 41(4), 287-292.
- Nelson, M.C., Story, M., Larson, N.I., Neumark-Sztainer, D., and Lytle, L.A. (2008). Emerging adulthood and college aged youth: An overlooked age for weight-related behavior change. *Obesity*, 16, 2205-2211. doi:10.1038/oby.2008.365.
- Nelson Laska, M., Pasch, K.E., Lust, K., Story, M., & Ehlinger, E. (2009). Latent class analysis of lifestyle characteristics and health risk behaviors among college youth. *Prevention Science*, 10, 376-386. doi: 10.1007/s11121-009-0140-2.
- Neumark-Sztainer, D., Falkner, N., Story, M., Perry, C., Hannan, P.J., & Mulert, S. (2002). Weight-teasing among adolescents: correlations with weight status and disordered eating behaviors. *International Journal of Obesity Related Metabolic Disorders*, 26, 123–131.

- Nichter, M., Nichter, M., Vuckovic, N., Tesler, L., Adrian, S., & Ritenbaugh, C. (2004). Smoking as a weight-control strategy among adolescent girls and young women: A reconsideration. *Medical Anthropology, 18*, 305-324.
- Office of Juvenile Justice and Delinquency Prevention. (2005). *Drinking in America: Myths, Realities, and Prevention Policy*. Washington, DC: U.S. Department of Justice, Office of Justice Programs, Office of Juvenile Justice and Delinquency Prevention, 2005. Available at:
http://www.udetc.org/documents/Drinking_in_America.pdf
- Park, M.J., Mulye, T.P., Adams, S.H., Brinids, C.D., & Irwin Jr, C.E. (2006). The health status of young adults in the United States. *Journal of Adolescent Health, 39*, 305-317.
- Pasch, K.E., Laska, M.N., Lytle, L.A., & Moe, S.G. (2010). Adolescent sleep, risk behaviors, and depressive symptoms: are they linked? *American Journal of Health Behavior, 34*(2), 237-248.
- Plotnikoff, R.C., Bercovitz, K., Rhodes, R.E., Loucaides, C.A., & Karunamuni, N. (2007). Testing a conceptual model related to weight perceptions, physical activity and smoking in adolescents. *Health Education Research, 22*(2), 192-202.
- Pope, H.G., & Yurgelun-Todd, D. (1996). The residual cognitive effects of heavy marijuana use in college students. *Journal of the American Medical Association, 275*(7).

- Racette, S.B., Deusinger, S.S., Strube, M.J., Highstein, G.R., & Duesinger, R.H. (2005). Weight Changes, Exercise, and Dietary Patterns during Freshman and Sophomore Years of College. *Journal of American College Health, 53*(6), 245-251.
- Ramaekers, J.G., Berghaus, G., van Laar, M., & Drummer, O.H. (2004). Dose related risk of motor vehicle crashes after cannabis use. *Drug and Alcohol Dependence, 73*, 109–119.
- Reed, M.B., Wang, R., Shillington, A.M., Clapp, J.D., & Lange, J.E. (2007). The relationship between alcohol use and cigarette smoking in a sample of undergraduate college students. *Addictive Behaviors, 32*, 449–464.
- Rew, L., & Horner, S.D. (2003) Youth resilience framework for reducing health-risk behaviors in adolescents. *Journal of Pediatric Nursing, 18*(6), 378–388.
- Ross, S.E., Niebling, B.C., & Heckert, T.M. (1999). Sources of Stress among College Students, *College Student Journal, 33*(2), 312-317.
- Schafer, M.H., & Ferraro, K.F. (2011). The stigma of obesity: Does perceived weight discrimination affect identity physical health? *Social Psychology Quarterly, 74*(1), 76-97.
- Schulenberg, J., O'Malley, P.M., Bachman, J.G., & Johnston, L.D. (2000). *Spread your wings and fly: The course of wellbeing and substance use during the transition to young adulthood*. In L. J. Crockett & R. K. Silberseisen (Eds.), *Negotiating*

adolescence in times of social change (pp. 224–255). New York: Cambridge University Press.

Serdula, M.K., Ivery, D., Coates, R.J., Freedman, D.S., Williamson, D.F., & Byer, T. (1993). Do obese children become obese adults? A review of the literature. *Preventative Medicine, 22*, 167-77.

Sridhar, K.S., Raub, W.A., Weatherby, N.L., Metsch, L.R., et al. (1994). Possible role of marijuana smoking as a carcinogen in the development of lung cancer at a young age. *Journal of Psychoactive Drugs, 26*(3), 285-288.

Srinivasan, S.R., Bao, W., Wattigney, W.A., & Berenson, G.S. (1996). Adolescent overweight is associated with adult overweight and related multiple cardiovascular risk factors: the Bogalusa Heart Study. *Metabolism-Clinical and Experimental, 45*, 235-240.

Steinberg, L. (2004). Risk taking in adolescence: what changes and why? *Annals of the New York Academy of Sciences, 1021*, 51-58.

Steptoe, A., Wardle, J., Plooard, T., Canaan, L., & Davies, G. (1996). Stress, social support and health-related behavior: a study of smoking, alcohol consumption and physical exercise. *Journal of Psychometric Research, 41*, 171–180.

Strine, T.W., Okoro, C.A., Chapman, D.P., Balluz, L.S., Ford, E.S., Ajani, U.A., et al. (2005). Health-related quality of life and health risk behaviors among smoking. *American Journal of Preventive Medicine, 28*(2), 182–187.

SPSS Inc. (2007). *SPSS Base 16.0 for Windows*. SPSS Inc., Chicago, IL.

Substance Abuse and Mental Health Services Administration. (2010). *Results from the 2009 National Survey on Drug Use and Health: Volume I. Summary of National Findings* (Office of Applied Studies, NSDUH Series H-38A, HHS Publication No. SMA 10-4586). Rockville, MD.

Substance Abuse and Mental Health Services Administration. (2009). *Results from the 2008 National Survey on Drug Use and Health: National Findings* (Office of Applied Studies, NSDUH Series H-36, HHS Publication No. SMA 09-4434). Rockville, MD. Available at <http://www.oas.samhsa.gov/nsduh/2k8nsduh/2k8Results.pdf>.

Substance Abuse and Mental Health Services Administration, Office of Applied Studies. (2009). *The NSDUH Report: Perceptions of Risk from Substance Use among Adolescents*. Rockville, MD. Available at: [http://www.oas.samhsa.gov/2k9/158/158Risk Perceptions.htm](http://www.oas.samhsa.gov/2k9/158/158Risk%20Perceptions.htm).

Serlachius, A., Hamer, M., & Wardle, J. (2007). Stress and weight change in university students in the United Kingdom. *Physiology & Behavior*, 92, 548-553.

U.S. Department of Health and Human Services. (2010). *Healthy People 2020 topics and objectives*. Washington, DC: U.S. Available at: [http://www.healthypeople.gov/2020/topics objectives 2020/default.asp](http://www.healthypeople.gov/2020/topics%20objectives%202020/default.asp).

U.S. Department of Health and Human Services. (2009). *Healthy People 2010*. 2nd ed. With Understanding and Improving Health and Objectives for Improving Health. 2 vols. Washington, DC: U.S. Government Printing Office.

U.S. Department of Health and Human Services. (2004). *The health consequences of smoking: A report of the surgeon general*. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health.

U.S. Department of Health and Human Services. Substance Abuse and Mental Health Services Administration. (2002). *Results from the 2001 national household survey on drug abuse: Volume I. summary of national findings*. Office of Applied Studies, NHSDA Series H-17 ed.) (BKD461, SMA 02-3758) Washington, DC: U.S. Government Printing Office.

U.S. Department of Health and Human Services. (2001). *The Surgeon General's call to action to prevent and decrease overweight and obesity 2001*. Rockville, MD: US Department of Health and Human Services, US Public Health Service, Office of the Surgeon General. Available at <http://www.surgeongeneral.gov/topics/obesity/calltoaction/CalltoAction.pdf>.

Warren, M., Forst-Pineda, K., & Gold, M. (2005). Body mass index and marijuana use. *Journal of Addictive Diseases, 24*, 95–100.

- Warren, M., & Gold, M. (2007). The relationship between obesity and drug use. *American Journal of Psychiatry*, *164*, 1628. doi: 10.1176/appi.ajp.2007.07030388.
- Wechsler, H., Lee, J.E., Nelson, T.F., & Kuo, M. (2002a). Underage college students' drinking behavior, access to alcohol, and the influence of deterrence policies. *Journal of American College Health*, *50*(5), 223–223.
- Wechsler, H., Kelley, K., Seibring, M., Kuo, M., & Rigotti, N.A. (2001). College smoking policies and smoking cessation programs: results of a survey of college health center directors. *Journal of American College Health*, *49*(5), 205-212.
- Wetter, D.W., Kenford, S.L., Welsch, S.K., Smith, S.S., Fouladi, R.T., Fiore, M.C., & Baker, T.B. (2004). Prevalence and predictors of transitions in smoking behavior among college students. *Health Psychology*, *23*, 168–177.
- Wharton, C.M., Adams, T., & Hampl, J.S. (2008). Weight loss practices and body weight perceptions among US college students. *Journal of American College Health*, *56*(5), 579-584.
- Wannamethee, S.G., & Shaper, A.G. (2003). Alcohol, body weight, and weight gain in middle-aged men. *American Journal of Clinical Nutrition*, *77*, 1312–1317.
- Wood, P.K., Sher, K.J., Erickson, D.J., & DeBord, K.A. (1997). Predicting academic problems in college from freshman alcohol involvement. *Journal of Studies on Alcohol and Drugs*, *58*(2), 200–210.

Zucker, A.N., Harrell, Z.A., Miner-Rubino, K., Stewart, A.J., Pomerleau, C.S., & Boyd, C.J. (2001). Smoking in college women: The role of thinness pressures, media exposure, and critical consciousness. *Psychology of Women Quarterly*, 25, 233-241.

VITA

Whitney Jaye Lang was born in Waterloo, Iowa. After graduating from Cedar Falls High School in Cedar Falls, Iowa in 2003 she was accepted to the University of Northern Iowa, Cedar Falls, Iowa. She received her Bachelor of Arts degree in Physical Education with a focus on Exercise Science in 2006. During the following years, Ms. Lang worked for the YMCA and Mercy Medical Center. In September of 2009 she began Graduate School at the University of Texas at Austin.

Permanent Address: 127 N Glover Street, Baltimore, MD 21224

This Thesis was typed by Whitney J. Lang.