

ALCOHOL USE AND MENTAL HEALTH ISSUES IN FIFTH-YEAR COLLEGE  
STUDENTS

by

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## ABSTRACT

PILAR del CASTILLO ZUBER. Alcohol use and mental health issues in fifth-year college students. (Under the direction of DRs. JAMES STUDNICKI and MICHAEL E. THOMPSON)

The purpose of this study was to develop a profile of at-risk 5<sup>th</sup>-year students by assessing the relationships between heavy alcohol use and mental health issues, on academic performance in 5<sup>th</sup>-year students. This secondary analysis study used the National College Health Assessment (NCHA) datasets from survey years Fall 2000-Spring 2008. Using the Social Cognitive Theory as the conceptual framework, the outcome variable was C/D/F GPA in 5<sup>th</sup>-year college students. The independent variables were Alcohol Use and Mental Health Issues. T-tests, one-way ANOVA, and chi-square analysis were used to determine differences in groups. Logistic regression and Structural Equation Modeling were used to determine predictors of lower GPA in 5<sup>th</sup>-year students. The results indicate that 5<sup>th</sup>-year students are a distinct group from 1<sup>st</sup>- 4<sup>th</sup>-year college students in terms of increased alcohol use and increased prevalence of mental health issues. Alcohol use; experience of moderate and severe mental health symptoms; experiences of Bulimia, Depression, and Substance Abuse; and Mental Health Consequences were significant predictors of C/D/F GPA in 5<sup>th</sup>-year college students. Targeted policies and programs aimed at the unique profile of 5<sup>th</sup>-year college students should address 5<sup>th</sup>-year college students' alcohol use behaviors as well as mental health.

## DEDICATION

This dissertation is dedicated to my families, both the del Castillos and Zubers, for encouraging and supporting me in my pursuit of this degree, particularly my husband, Andy, for his love, understanding, and support through all the late nights, early mornings, and long weekends. Your sacrifices have meant more than mere words can express.

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## LIST OF ABBREVIATIONS

ACHA	American College Health Association
ADD	Attention Deficit Disorder
ADF	asymptomatic distribution-free
AMOS	analysis of moment structures
ANOVA	analysis of variance
BAC	blood alcohol concentration
CFI	Comparative Fit Index
CFS	Chronic Fatigue Syndrome
CMIN	Chi-square value
CMIN/DF	Chi-square value divided by degrees of freedom
DF	degrees of freedom
GLS	generalized least squares
GPA	grade point average
IRB	Institutional Review Board
M	mean
ML	maximum likelihood
NCAA	National Collegiate Athletic Association
NCHA	National College Health Assessment
NIAAA	National Institute on Alcohol Abuse and Alcoholism
RMSEA	root mean square error of approximation
SAD	Seasonal Affective Disorder
SCT	Social Cognitive Theory

SD	standard deviation
SEM	Structural Equation Modeling
SPSS	Statistical Packages for the Social Sciences

## CHAPTER 1: INTRODUCTION

Alcohol use, mental health issues, and poor retention and graduation rates plague our nation's college and university campuses, and it is unlikely that these three problems are mutually exclusive. Alcohol use and mental health issues, though long in the focus of public health efforts, remain significant concerns with significant consequences. Efforts to increase retention and graduation rates contribute to a growing prevalence of 5<sup>th</sup>-year and up college students (hereafter referred to as "5<sup>th</sup>-year students"), a relatively unknown population in the research literature.

As the leading killer of college students<sup>1,2</sup> alcohol use is the leading public health problem on college campuses,<sup>3</sup> garnering the attention of the federal government,<sup>4</sup> the Surgeon General,<sup>5</sup> college officials, parents, and community leaders.<sup>6</sup> The federal government identified alcohol use on college campuses, mainly heavy use or binge drinking, as a serious public health problem,<sup>4</sup> including reduction of heavy alcohol use on college campuses among the objectives for Healthy People 2020.<sup>7</sup> While much focus is on underage and heavy drinking, a larger number of drinkers are affected by problematic alcohol use,<sup>8</sup> defined as moderate to heavy use leading to problems, though not always addiction.<sup>8,9</sup> As many as 9 out of 10 college students drink and about half binge drink regularly,<sup>2,10-12</sup> resulting in more than 1800 alcohol-related deaths and 500,000 alcohol-related injuries each year,<sup>13,14</sup> as well as a variety of health, academic, legal, and economic consequences.<sup>1,10,11,15,16</sup>

In addition to, but not entirely separate from the alcohol problem, colleges also are facing the issue of serious mental health disorders among students. Though mental health problems among college students are not new,<sup>17, 18</sup> they are increasing in severity,<sup>19, 20</sup> and have similar health and academic consequences as alcohol use.<sup>21</sup> Almost half of students report experiencing significant depression at some time, and 1 in 10 has thoughts of suicide.<sup>22</sup> Mood (10%), anxiety (12%), and personality disorders (18%)<sup>23</sup> are most common. However, traditional estimates of campus mental health prevalence rates are generally drawn from those that visit university student health and/or counseling centers, resulting in data not necessarily representative of the student population as a whole. These estimates exclude those experiencing symptoms of mental health disorders without a clinical diagnosis. Given that students seeking help represent only 20% of students admitting to problems,<sup>22</sup> this issue can no longer be ignored.

Compared to alcohol use and mental health issues, the growing prevalence of 5<sup>th</sup>-year college students is a relatively new phenomenon. While likely to graduate at some point,<sup>24, 25</sup> 5<sup>th</sup>-year students do not complete their degrees within the traditional four-year time frame, remaining in school for at least an extra year or more. These 5<sup>th</sup>-year students are distinguished from those that remain in school for five years as a result of enrolling in a structured 5-year academic program, or NCAA student-athletes that red-shirt for a year. While these students are included in the retention and graduation rate literature, though not necessarily as a unique population, these students remain unstudied from a health perspective. The little existing evidence supports increases in alcohol use among students over age 21<sup>14, 26</sup> and a greater likelihood of seniors using mental health services.<sup>19</sup> The parallels between the effects of alcohol use and mental health on

academic performance suggest unique challenges found within this emerging population worthy of attention from health services, public health, and mental health researchers.

The long-term goal of this study is to reduce problematic alcohol use among 5<sup>th</sup>-year students. The specific objective of this study was to develop a profile of at-risk 5<sup>th</sup>-year students and assess the data for evidence of the robustness of the model of the relationships between heavy alcohol use and mental health issues, on the outcome variable: academic performance in 5<sup>th</sup>-year students.

College seniors are more likely to visit college counseling centers<sup>19</sup> as well as have tendencies to drink to cope with stress.<sup>27, 28</sup> Though limited in scope, these findings coupled with the increasing number of 5<sup>th</sup>-year students indicates a need for further study into the health issues among this population. Based on these findings, the central hypothesis was that alcohol use and mental health issues are more prevalent in 5<sup>th</sup>-year students. The conceptual model for this research study was based on the Social Cognitive Theory,<sup>29</sup> exploring the relationship between problematic alcohol use, mental health issues, and 5<sup>th</sup>-year students, as well as the interactive effect of problematic alcohol use and mental health issues on 5<sup>th</sup>-year students.

The rationale for the research is that informing healthcare providers and policy makers of the characteristics and correlates of at-risk 5<sup>th</sup>-year students will enable them effectively to target policy interventions and programs to reduce the incidence of coping-related alcohol use and mental health issues in this population. Using data from the National College Health Assessment (NCHA-I), a nationally representative, cross-sectional survey of college students and institutions collected by the American College Health Association (ACHA), this study pursued four specific aims:

1. Examine differences in alcohol use and mental health issues between 5<sup>th</sup>-year students and each year-in-school group (1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup>, and 4<sup>th</sup>-year students);
2. Examine differences in alcohol use and mental health issues among 5<sup>th</sup>-year students, by sex, race, and grade point average;
3. Develop a predictive model of characteristics of at-risk 5<sup>th</sup>-year students;
4. Assess the fit of the proposed conceptual model relating alcohol use and mental health issues to at-risk 5<sup>th</sup>-year students.

This innovative study focused on an understudied population in the public health literature. Aims 1 and 2 described the relationship between alcohol use and the incidence of mental health issues in this population. Aim 3 established a risk profile for this particular population. Aim 4 identified specific relationships between alcohol use and mental health issues in 5<sup>th</sup>-year students. Collectively, these findings inform policy makers and health professionals, leading to meaningful environmental changes.

## CHAPTER 2: LITERATURE REVIEW

This chapter presents a review of the literature used as a basis for this study. The review is organized around the conceptual model. An overview of alcohol use and mental health issues are presented first, followed by a review of the literature on 5<sup>th</sup>-year students. The final section contains an overview of the Social Cognitive Theory (SCT) and its application to alcohol use, mental health, and 5<sup>th</sup>-year college students.

### Alcohol use among college students

Magnitude: The federal government identifies alcohol use on college campuses, mainly heavy use, or “binge drinking” as a serious public health problem. Some even call it the “greatest public health problem” campuses face,<sup>3</sup> given its position as the leading cause of death for college students.<sup>1, 2, 13, 14</sup> Once defined as consuming four or more drinks for females and five or more drinks for males at a time,<sup>11</sup> the Surgeon General’s office<sup>5</sup> defines binge drinking as:

*A pattern of drinking alcohol that brings blood alcohol concentration (BAC) to 0.08 gram-percent or above. For a typical adult, this pattern corresponds to consuming five or more drinks (male), or four or more drinks (female), in about two hours.*

Healthy People 2020 identifies reducing alcohol use on college campuses among its objectives.<sup>7</sup> In 2002, the National Institute of Alcohol Abuse and Alcoholism (NIAAA) and the Department of Health and Human Services released *A Call to Action: Changing the Culture of Drinking at U.S. Colleges*. This report, a result of a three year intensive research effort by the NIAAA’s Task Force on College Drinking, highlighted



not only the drinking trends on college campuses, but also painted a big picture of the negative consequences of drinking, as well as suggestions for action.<sup>4</sup> While much focus is on underage and heavy drinking, a larger number of drinkers are affected by problematic alcohol use,<sup>8</sup> defined as moderate to heavy use leading to problems, though not always addiction.<sup>8,9</sup>

Approximately half of 18-20 year-olds and more than two-thirds of 21-25 year-olds in the U.S. drink alcohol.<sup>30</sup> College students, particularly White males, are more likely to drink than their non-college peers.<sup>10, 12, 13, 31</sup> Approximately 9 out of 10 college students drink alcohol, and about half of them binge drink at least occasionally,<sup>2, 10-12</sup> up from about 40% in 1995.<sup>11</sup> About one-fourth of college drinkers binge drink on a regular basis.<sup>11</sup>

Research consistently supports that college males drink more than females.<sup>31-33</sup> Much of the difference in drinking patterns is often attributed to differing social expectations and individual alcohol expectations. Males are more likely to experience social pressure to drink<sup>34, 35</sup> to conform to “masculine norms.”<sup>36, 37</sup> Males also reported greater likelihood of drinking to get drunk, out of boredom, dependence on alcohol, to help with sleep,<sup>37</sup> and to reduce stress.<sup>27</sup> Women were more likely to report drinking to meet male expectations of female alcohol use<sup>38</sup> and as an escape from problems.<sup>37</sup> Male and female patterns of drinking also diverge during the college experience. Females were more likely to demonstrate consistent patterns of alcohol consumption throughout college, while males’ consumption generally increases over time in school.<sup>35</sup>

Racial comparisons of drinking behavior indicate that drinking is highest among Whites,<sup>39, 40</sup> particularly heavy drinking.<sup>31</sup> Blacks report the lowest levels of drinking.<sup>31,</sup>

<sup>33, 39, 41</sup> Hispanic, Native American, and Asian students usually fall somewhere in the middle.<sup>31, 33, 40</sup> Whites report drinking to get drunk, relax, and enjoy themselves more so than other racial groups.<sup>37</sup> Drinking among racial minorities is less studied, but is associated with perceived discrimination.<sup>41</sup> One study found that Blacks were more likely to report drinking out of boredom than Whites.<sup>37</sup> Asian students reported drinking to conform or cope.<sup>40</sup>

Consequences: Too often, serious consequences follow binge drinking, both direct and indirect. Direct consequences primarily affect the alcohol user. Indirect consequences affect those around the alcohol user. Additionally, the consequences of alcohol use span a wide variety of areas such as health issues, academic issues, legal issues, and economic issues, often overlapping categories. Some of the negative consequences as reported in the 2002 NIAAA Task Force Report<sup>4</sup> include:

- 1,400 alcohol-related deaths per year
- 500,000 alcohol-related unintentional injuries
- 600,000+ alcohol-related assaults
- 70,000+ victims of alcohol-related rape or sexual assault
- 400,000 students engaging in unprotected sex
- 1/4 of students with alcohol-related academic problems
- 150,000 students developing health problems as a result of alcohol use
- 2.25+ million students driving drunk
- 1 in 10 drinkers vandalizing property
- over 100,000 arrests for alcohol-related violations

A 2005 update to the report stated that alcohol-related deaths increased to 1,700 annually, and the number of students driving drunk rose to 2.8 million.<sup>1</sup>

Consistent with rates of alcohol use, males are more likely to report experiencing consequences of alcohol use than female students.<sup>32, 33</sup> It is incorrect, however, just to examine the difference in quantity of alcohol consumed. Because of physiological differences, females are affected by fewer drinks than men<sup>33</sup> and as such, may experience problem drinking at lower thresholds than males. In examining racial groups, White and

Native American students were more likely to report experiencing consequences, followed by Hispanic students.<sup>33</sup> Black and Asian students were least likely to experience alcohol-related consequences.<sup>33</sup> Asians are affected physiologically by fewer drinks than other races. Although Asian students generally drank less than Whites, these physiological differences may increase their risk of problematic or risky drinking behavior.<sup>40</sup>

While the following consequences are described on the individual level, these consequences collectively have implications at the institutional level. Health-related consequences may include illness, dependence, intentional and unintentional injuries, and sexual assault or rape, which may lead to unplanned pregnancies or sexually transmitted infections.<sup>12, 15, 33, 42</sup> While drunk driving deaths comprise the largest proportion of alcohol-related deaths among college students,<sup>1, 13, 14</sup> on the rise is the number of deaths attributable to alcohol poisoning.<sup>14</sup>

Academic performance often is negatively impacted by alcohol use, affecting about one in four students. Students perform poorly on class assignments and examinations, often prompted by poor class attendance.<sup>11</sup> Unfortunately, academic consequences are not always limited to the drinker themselves. Disruptive roommates may interrupt sleep or studying,<sup>10, 15</sup> resulting in negative consequences for those around them.

Each year, over 100,000 students are arrested or cited for alcohol-related offenses by campus and local law enforcement.<sup>1, 13, 14</sup> Some of the more serious offenses, such as drunk driving, carry severe legal consequences. However, many students do not always realize the long-term consequences that those citations may carry, even prohibiting them

from obtaining internships or jobs after graduation if a background check must be run.<sup>43</sup>

While largely concerned with the public and personal health consequences of college alcohol use, it is also a fairly substantial economic issue.<sup>44</sup> Unfortunately, no studies have calculated the financial impact to colleges and universities. Studies have calculated that college students buy more than \$5 billion dollars' worth of alcohol every year, far more than most of their other college-related costs, averaging a little more than \$450 per student.<sup>44</sup> In addition, the U.S. spends almost \$70 billion every year addressing underage alcohol-related costs such as medical expenses, work-related losses, legal costs, and premature death.<sup>45</sup>

Other often overlooked economic costs include extra tuition students pay when they must retake courses that they failed, or stay in school longer than the traditional four years. Costs also are associated with unintended pregnancies and the costs of raising a child far earlier than thought. Students who consume alcohol may reduce their earning potential upon completing college, as a result of their alcohol-affected academic performance while in school.<sup>16</sup>

#### Mental Health Issues among college students

Magnitude: Though it seems a relatively recent issue in the wake of major events such as the Virginia Tech campus shootings, mental health problems among college students are not new,<sup>17, 18</sup> first coming to attention in the 1920s following the first World War.<sup>46</sup> The violent nature of recent events warrants the claim that they are increasing in severity,<sup>19-21, 47</sup> however, the literature on increased severity remains mixed.<sup>48-50</sup> Those disputing the increase in severity point instead to changing student populations, greater access to mental health care, greater numbers of students arriving at school with a mental

disorder, and increased use in medications<sup>48-50</sup> and a focus on security as opposed to services<sup>46</sup> for the perception of increased severity.<sup>20</sup>

The issue of increases in seriousness aside, mental health among college students is something that deserves a great deal of attention. One-third of all students report any sort of mental health issue.<sup>51</sup> Mood disorders overall account for 10% of diagnoses in college students,<sup>23</sup> but depression is by far the most common mental health issue and it continues to increase.<sup>49</sup> Rates of depression are five to six times higher for high school and college students than during the Depression Era.<sup>47</sup> One in four students has been diagnosed with or screens positively for depression,<sup>49, 51, 52</sup> almost half report experiencing significant depression at some time,<sup>22</sup> and 1 in 10 has thoughts of suicide.<sup>22, 52</sup> Other commonly diagnosed disorders are anxiety (12%) and personality disorders (18%).<sup>23</sup>

Overall, female college students report higher levels of psychological symptoms than males.<sup>53</sup> They are also usually thought of as having higher rates of depression, but there is some evidence to support that males are more likely to meet the criteria for depressive disorder,<sup>54</sup> particularly more severe forms of depression.<sup>55</sup> Females may report higher rates due to an increased likelihood of seeking treatment earlier.<sup>55</sup>

The literature on racial differences in mental health among college students is limited. Whites are generally more likely to use health care services,<sup>56, 57</sup> though they are not necessarily more likely to experience mental health issues as compared to other racial groups.<sup>53</sup> Getting a clear picture of racial and ethnic differences in mental health issues may be difficult due to a lack of universal understanding of mental health issues across racial and ethnic groups.<sup>58</sup> Minorities are more likely to report symptoms, even though

they may be less likely to be diagnosed.<sup>59</sup> Among racial and ethnic minorities, much of the mental health literature is focused on the issue of perceived discrimination.

Minorities are more likely than Whites to report perceived discrimination and to experience mental health issues as a result.<sup>41, 60, 61</sup> In relating back to the issue of varied understandings and expression of mental health symptoms among minorities, Asian students generally associate perceived discrimination with anxiety, while Hispanic students associate it with stress.<sup>60</sup> Perceived discrimination also is associated with depression and suicidal thoughts among minority populations.<sup>60, 62</sup>

One reason for the difficulty in discerning whether or not an increase in severity exists is the inconsistency with which mental health data is measured and collected,<sup>21</sup> exemplified above. Some of the literature reports on actual diagnosed cases of a mental illness, while others use screening tools to determine presence of the issue. Populations from which the data is drawn also vary, from students seeking treatment in campus counseling centers to those that have been randomly or convenience sampled.

Traditional estimates of campus mental health prevalence rates are generally drawn from those who visit university student health and/or counseling centers, resulting in data not necessarily representative of the student population as a whole. These estimates exclude those experiencing symptoms of mental health disorders without a clinical diagnosis. Students seeking or receiving help represent only 20-35% of students admitting to problems.<sup>22, 49, 52, 63, 64</sup>

**Consequences:** The consequences of mental health issues among college students are similar to consequences of alcohol use<sup>21</sup> and also may manifest themselves at both the personal and institutional levels. Physical consequences include increased likelihood of

illness<sup>65</sup> and changes in appetite and sleep habits, leading to general feeling of fatigue.<sup>21</sup> Psychosocial consequences include impaired cognitive and emotional functioning.<sup>21</sup> Most severely, these impairments manifest themselves in such violent consequences as suicides and campus shootings such as the events at Virginia Tech in April 2007.

While the seriousness of these events is undeniable, focusing solely on severe consequences creates a negative stigma associated with mental health issues, increasing the likelihood of perceiving those with mental health issues as violent.<sup>46, 66</sup> Additionally, those experiencing symptoms may not perceive a need to seek services, instead viewing symptoms as normal or something they can handle on their own.<sup>64</sup> Mental health issues also may affect academic performance, including excessive absences from classes, missing assignments, lower course grades, and a lowered overall grade point average.<sup>17, 21, 67-69</sup> Depression in particular is a predictor of lower grade point average.<sup>69, 70</sup> At the personal level, these consequences may lead to lowered grades and perhaps less overall success, however at the institutional level may impact overall retention and graduation rates.<sup>21</sup>

Perhaps the most significant institutional-level consequence is the increased demand for services and the struggle to meet those needs. Although only a small fraction of those needing services actually utilizes them,<sup>22, 49, 52</sup> a shortage of service providers still persists. Though one full-time counselor is suggested for every 1,500 students by the International Association of Counseling Services, the national average remains at one counselor for every 1,900 full-time students.<sup>46</sup> The current economy only compounds the staffing and resource issue, increasing the urgency for alternate mental health initiatives.

## 5<sup>th</sup>-year students

A comprehensive literature review of 5<sup>th</sup>-year students is difficult to accomplish because no specific body of literature focuses on this population. Education literature focuses on time to graduation and identifies either rates of students graduating four, five, and six years after first enrolling,<sup>71, 72</sup> or graduation rates at 150% and 200% of “normal” time, the equivalent of graduating six and eight years, respectively, following first enrollment.<sup>73, 74</sup> “Normal” time to graduation is considered four years of full-time, continuous enrollment at a four-year institution,<sup>74</sup> though the average number of years to complete a bachelor’s degree actually has been about 55 months, or 5 academic years since the 1970s.<sup>25</sup> Thirty-six percent of students complete bachelor’s degrees in four years,<sup>71</sup> 57% complete them within six years,<sup>71, 73, 75, 76</sup> and 60% complete them in eight years.<sup>73</sup> While the relatively high six- and eight-year graduation rates signal successful efforts to retain and graduate students, they also point to an increasing number of students who remain in school for at least an extra year or more, the effects of which are unknown.

Despite the increase in the number of these students, little literature exists about them and why they take longer to finish than other students. Excluding red-shirted athletes and those enrolled in five year programs, the most commonly cited reasons for the increased time in school are choice of major,<sup>25</sup> change of major,<sup>25, 77</sup> and financial issues.<sup>72, 78</sup> Choice of major is not as critical a reason as some majors, such as engineering, traditionally require internships or co-op experiences which add a semester or year to the traditional four-year program.<sup>25</sup> Change of major is a more serious reason as both institutional and personal factors may contribute. Poor academic advising and



inadequate course offerings<sup>78</sup> are the primary institutional factors related to changing majors. At the personal level, change in major may be due to changing interests as well as the need to select an alternate major if not accepted to one's primary major of interest,<sup>77</sup> often due to poor grade point average.<sup>79</sup> Change in major often leads to a need to take a new set of prerequisite courses, leading to more time in school.<sup>25</sup> Students also may stay in school longer due to the increased costs of higher education and the need to work to pay for education and living expenses.<sup>72, 73, 78</sup> Working during school is associated with taking fewer credits per semester, increasing time to graduation.<sup>76</sup>

Alcohol Use: Although no specific body of literature exists for 5<sup>th</sup>-year college students, an attempt was made to assess the literature by focusing a search on alcohol use and consequences among college students identified in the literature as seniors and/or upperclass students. Literature was included if it provided information (data table or within results section) specific to college seniors or upperclass students. The scant literature offers evidence of a shift in drinking patterns among seniors and upperclass students. Studies published prior to 2007<sup>80-83</sup> consistently reported that seniors drank less than freshmen students. While Allen et al.,<sup>80</sup> report that legal-aged students drank more often, they were less likely to be heavy drinkers. Heavy drinking was most associated with freshmen or underclass students<sup>81-83</sup> and decreased with time in school, findings which support the theory that many students "mature out" of heavy drinking behavior.<sup>84</sup> More recent literature points to an increase in alcohol consumption among senior students. Pascarella,<sup>85</sup> Leeman,<sup>86</sup> Nelson,<sup>87</sup> and DeMartini<sup>88</sup> report that seniors and upperclassmen were more frequent binge drinkers and consumed more alcohol at each drinking occasion than freshmen.

Reasons for drinking: Findings related to reasons for drinking are mixed. Some findings indicate that seniors are more likely to drink for coping reasons, such as job and school-related stress, than to conform with peer groups.<sup>84</sup> These findings are consistent with the occasional drinking<sup>80</sup> at off-campus bar environments they are most likely to drink in,<sup>83</sup> as compared to freshman students. However despite finding that legal age drinkers were less likely to drink heavily, Allen et al.,<sup>80</sup> also found that peer pressure was reported more often among legal age drinkers, a finding supported by Martens et al.<sup>89</sup> Pedersen et al.,<sup>90</sup> found that students in all years overestimated the drinking of their peers, as well as other classes, leading to increases in actual alcohol use. Values towards alcohol use developed during sophomore year were most likely to predict senior year drinking behaviors.<sup>91</sup>

The other major theme to emerge related to drinking motives was sensation seeking. Sensation-seeking in the context of alcohol use is drinking for the purpose of feeling less inhibited or to combat boredom.<sup>86</sup> Low sensation seeking was related to increased likelihood of protective behaviors,<sup>92</sup> while higher sensation seeking was related to increased episodes of binge drinking. Similar to the earlier shift in drinking prevalence among seniors, an earlier study reported seniors less likely to drink to combat boredom,<sup>84</sup> while a more recent study finds seniors having the highest sensation-seeking scores.<sup>86</sup>

Consequences of alcohol use: Consequences of alcohol use were both short- and long-term. Short-term consequences included an increased likelihood of presenting to the emergency department with an alcohol-related injury among legal-age drinkers,<sup>93</sup> though Harford et al.,<sup>94</sup> report that seniors were the least likely to be involved in disruptive behavior and be injured as a result of altercations as compared to freshmen. Other short-

term consequences are negative impact to semester GPA<sup>85</sup> and an increased likelihood of unprotected sex,<sup>92</sup> both of which have the potential for long-lasting effects. Juniors and seniors were more likely to be accepting of negative alcohol-related consequences.<sup>88</sup>

Regarding long-term consequences, Nezelek et al.,<sup>95</sup> explored social interactions and binge drinking among upperclassmen and found that reduced intimacy in social relationships was related to more than 3 weekly binge-drinking episodes as well as no binge-drinking episodes. The impact to the romantic relationship differed between males and females. Females reported a positive relationship between binge drinking and intimacy, while males saw the opposite effect.<sup>95</sup>

Mental Health: Much like alcohol use, as no body of mental health literature exists on 5<sup>th</sup>-year college students; an attempt was made to assess the literature by focusing a search on mental health issues among college seniors and upperclass students. Seniors tend to experience less stress than freshmen and sophomores,<sup>96,97</sup> but more stress than juniors.<sup>96</sup> Stress among juniors and seniors generally was related to self-imposed pressure, but they had fewer emotional, behavioral, and physiological reactions to stress.<sup>97</sup> Juniors and seniors had lower anxiety and reactions to stress than freshmen and sophomores.<sup>98</sup> Seniors reported more depersonalization, but less emotional exhaustion than freshmen and sophomores, and similar levels of personal achievement as freshmen and juniors.<sup>99</sup> Depression levels were lowest among seniors.<sup>96</sup> Schools commonly focus on problems of adjustment to school by freshmen, but suicide rates among undergraduates are highest among seniors.<sup>100</sup>

Beyond the information provided above, not much more is known about this population and why many more students take longer to finish school. It may be that

information about this group is more difficult to capture. Retention and health-related efforts generally focus on 1<sup>st</sup>- and 2<sup>nd</sup>-year students because of the adjustment associated with the transition from high school to college whereas older students are believed to have adjusted.<sup>101</sup> Traditional views of college student drinking trajectories point to students “maturing out” of heavy and problematic drinking behaviors as they progress through college.<sup>102, 103</sup> As such, these 5<sup>th</sup>-year students would be considered least at-risk for alcohol-related issues.

Accessing these students is difficult due to the lack of classification or means of identification. Traditional year-in-school labels for college students (Freshman, Sophomore, Junior, Senior) are often equated with the number of years in school, though institutions use them related to number of credit hours earned, regardless of the number of years a student has been in school. “Senior” status is assessed after earning a minimum number of credits, and does not allow for discrimination between students who have been in school longer than others. A more accurate means of assessing year-in-school is to use numerical labels that correspond to the number of years a student has been in school (1<sup>st</sup>-year, 2<sup>nd</sup>-year, etc.). Numerical labeling is the method used in the National College Health Assessment.<sup>104</sup>

Due to the lack of research in this population, little is known about specific alcohol and mental health issues that may contribute to extended time to degree. Contrary to the traditional theory that college students mature out of alcohol use, more recent evidence points to increases in alcohol use among students over age 21.<sup>14, 26</sup> Additionally, seniors are more likely to utilize mental health services than younger students.<sup>19</sup> The parallels between the effects of alcohol use and mental health on

academic performance suggest unique challenges found within this emerging population worthy of attention from health services, public health, and mental health researchers and practitioners.

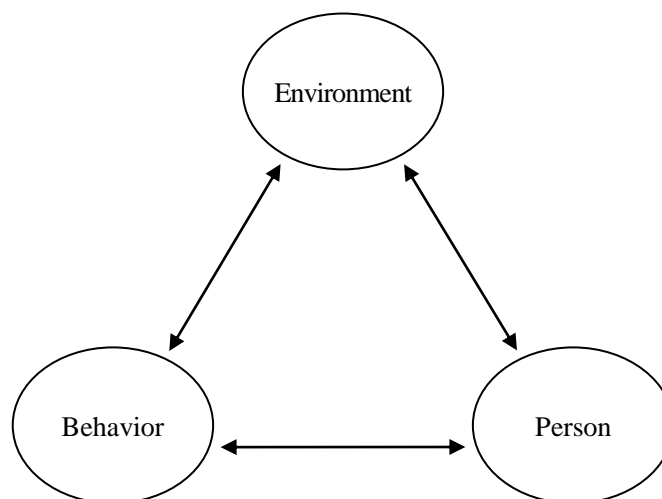
Some argue that staying in school an extra year or more ultimately may be beneficial for some students.<sup>78</sup> However, one must wonder why if college is generally structured as a four-year period, why it takes so many students longer than four years to complete a college education. And, if four years is still the standard, can future 5<sup>th</sup>-year students be identified in advance? Perhaps if we can identify the point along their college career at which the trajectory shifts from completion in four years to five or more, we can target policies and interventions toward reducing unintentional 5<sup>th</sup>-year college students.

This study is innovative because it aims to increase understanding of an understudied population in the health services, public health, and mental health literature. It will describe the relationship between alcohol use and the incidence of mental health issues in 5<sup>th</sup>-year college students and establish a risk profile for this particular population. It is imperative to better elucidate factors that influence time to degree in order to reduce unnecessary increases of time in school.

#### Framework

This research study was based primarily on the Social Cognitive Theory. The Social Cognitive Theory (SCT) also is referred to as the Social Learning Theory, which was its precursor. Developed in the 1960s by Alfred Bandura, it focused on the concept of observational learning. Bandura believed that people did not only “learn by doing,” but also from observing others- what actions they take, and the consequences of their actions.<sup>29, 105</sup> The SCT has three basic constructs: the person, the behavior, and the

environment. These three concepts are dynamic and can affect, and be affected, by each other at the same time, a phenomenon known as *reciprocal determinism*<sup>29</sup> (Figure 1).



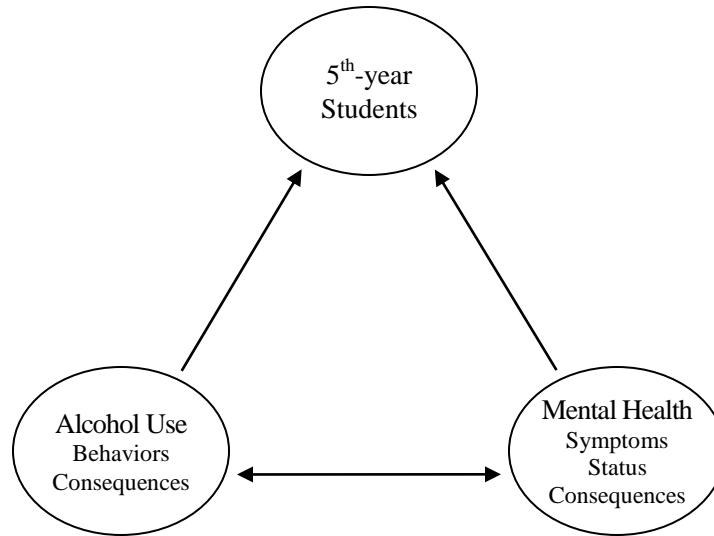
**Figure 1: Social Cognitive Theory**

**Environment:** This study outcome is focused on the environmental factor construct of the Social Cognitive Theory, operationalized in this study as the 5<sup>th</sup>-year students. Conceptualizing the 5<sup>th</sup>-year students as the environment construct most appropriately reflects the specific aims to examine factors that contribute to the increased existence of this group. Fifth-year students were examined in several group comparisons: sex, race, and grade point average. In the final comparison, grade point average was used to separate 5<sup>th</sup>-year students into low-risk (A/B GPA) and high-risk (C/D/F GPA) groups to assess level of risk.

**Behavior:** The behavior factor construct was operationalized as Alcohol use. The alcohol use variable was comprised of two subcategories: alcohol use behaviors and alcohol use consequences. Alcohol use behaviors include amount of alcohol consumed and frequency of alcohol consumption. Consequences of alcohol use were measured as physical, psychosocial, and academic consequences. Consequences of alcohol use were

measured by a separate question asking only about “alcohol use” and were not specifically tied to an amount of alcohol consumed. The separation of amount of alcohol consumed and consequences of alcohol use allowed for better inference of problematic alcohol use (problems associated with moderate or heavy use).<sup>8,9</sup>

Person: The person factor construct was operationalized as Mental Health. The mental health variable is comprised of three subcategories: Mental health symptoms, mental health status, and mental health consequences. Mental health symptoms were measured through a set of questions that asked if the respondent had felt a variety of psychosocial symptoms over the past 12 months. Mental health status was assessed through a set of parallel questions, mental health experiences, and mental health diagnoses. The first asked if the respondent had experienced any of a list of issues during the past 12 months. Mental health diagnoses were measured through a parallel question that asked if the respondent ever had been diagnosed with any of the same issues. Mental health status was calculated as a combination of these two variables. Utilizing both of these variables allowed for inferences based on four respondent trajectories: (1) those without experiences or diagnoses; (2) those with experiences, but no diagnoses; (3) those with experiences and diagnoses; and (4) those with no diagnoses, but experiences. Mental health consequences were measured as academic consequences. Figure 2 illustrates the relationship of the variables.



**Figure 2: Relationship of Variables Applied to Social Cognitive Theory**

### Purpose

This study developed a profile of at-risk 5<sup>th</sup>-year students by assessing the relationships between heavy alcohol use and mental health issues, on academic performance in 5<sup>th</sup>-year students. It:

1.) Examined differences in alcohol use and mental health issues between 5<sup>th</sup>-year students and each year-in-school group (1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup>, and 4<sup>th</sup>-year students);

H<sub>1</sub>: 5<sup>th</sup>-year students are more likely to consume greater amounts of alcohol and to experience more mental health issues than other classes of students.

2.) Examined differences in alcohol use and mental health issues among 5<sup>th</sup>-year students, by sex, race, and grade point average;

H<sub>2</sub>: Males, Whites, and those with C/D/F grade point averages are more likely to consume more alcohol and experience more mental health issues than their respective counterparts (females, minorities, and A/B average students).



3.) Developed a predictive model of characteristics of at-risk 5<sup>th</sup>-year students.

H<sub>3</sub>: 5<sup>th</sup>-year students with C/D grade point averages are more at risk for problematic alcohol use and mental health issues than 5<sup>th</sup>-year students with A/B grade point averages.

4.) Assessed the fit of the proposed conceptual model relating alcohol use and mental health issues to at-risk 5<sup>th</sup>-year students.

## CHAPTER 3: METHODS

This chapter presents the methods used to conduct this study. A description of the data source is presented first, followed by the methods used to prepare the data set for analysis, and a description of the variables included in the study. The final section of this chapter presents an overview of the data analysis methods, organized by specific aim. The Institutional Review Board (IRB) at UNC Charlotte approved the research protocol (Protocol # 11-11-07, see Appendix B).

### Data Source

This secondary analysis study used the National College Health Assessment (NCHA) datasets from survey years Fall 2000-Spring 2008. The American College Health Association (ACHA) collects the NCHA. The NCHA is a nationally representative, cross-sectional survey of college students and institutions. Data collection takes place during the Fall and Spring of each academic year.<sup>104</sup> Student characteristics include demographic characteristics, health status, experiences with health issues, risk behaviors, perceptions of risk behaviors, and services/information received. Institutional characteristics include enrollment size, public/private, region, religious affiliation, and minority-serving status. As a revised version of the survey instrument was introduced in Fall 2008, the original version of the survey, used in this study, is now referred to as NCHA-I.

Sampling: All institutions self-select to participate in the NCHA-I. Sampling for the NCHA-I may be either random sampling or another method of sampling. Only institutions sampling participants using an ACHA approved random sampling method are included in the national dataset.<sup>104</sup> Approximately 90% of institutional datasets are included. The sample collected each semester is an independent sample. The number of participating institutions and sample sizes for each NCHA-I data collection point included in the national dataset are shown in Table 1.

**Table 1: NCHA-I Survey Period, Institutional Participation, and Sample Size Spring 2000–Spring 2008**

ACHA-NCHA Survey Periods	Survey Mode	Institutional Data Sets	Sample (n)
Spring 2000	Paper	28	16,024
Fall 2000	Paper	20	10,413
Spring 2001	Paper	31	16,813
Fall 2001	Paper	8	4,717
Spring 2002	Paper	44	28,258
Fall 2002	Paper	20	10,374
Spring 2003	Paper & Web	33	19,497
Fall 2003	Paper & Web	21	11,990
Spring 2004	Paper & Web	74	47,202
Fall 2004	Paper & Web	50	24,804
Spring 2005	Paper & Web	71	54,111
Fall 2005	Paper & Web	29	16,832
Spring 2006	Paper & Web	117	94,806
Fall 2006	Paper & Web	34	23,863
Spring 2007	Paper & Web	107	71,860
Fall 2007	Paper & Web	39	20,507
Spring 2008	Paper & Web	106	80,121
<b>Cumulative Participation in Original ACHA-NCHA</b>		832	552,192

## Data Preparation

The dataset was obtained from the ACHA and was used with their permission.

The initial dataset included 261 variables and 552,192 observations. The following steps

were taken to prepare the dataset for analysis. First, a codebook was created to match the variable information and data with the corresponding questions on the NCHA Survey Instrument. This codebook was used to guide the elimination of variables from the dataset that were not utilized in this research study (136 eliminated).

Second, all variables with dichotomous (Yes/No) item responses were recoded to reflect a consistent 0=No/1=Yes scheme in the dataset. Third, the Race variables were merged to create one categorical variable and dummy coded to reflect students who selected either one racial category (White, Black, Hispanic, Asian, Native American, Other), more than one racial category, or no race category.

For this study, the data for analysis were selected using the following inclusion criteria: (1) data from full academic years; (2) undergraduate students; (3) ages 18-26; (4) full-time students; and (5) four-year institutions. Using these criteria yielded a sample of 377,645 full-time undergraduate students across eight academic years (Fall 2000/Spring 2001 – Fall 2007/Spring 2008), representing 68% of the original dataset. Similarly to Adams, et al.,<sup>106</sup> these data were validated by omitting values greater than four standard deviations from the mean on three continuous alcohol-related variables: *Number of hours of alcohol use the last time the student “partied”* (>14); *Number of drinks consumed the last time the student “partied”* (>23); and *Number of times in past 2 weeks drinking same or more alcohol as last time “partied”* (>10). Applying these criteria resulted in the removal of 3,674 observations (.01% of the data) and a final analytic sample of 373,971 observations.

#### Variables of Interest

Table 2 depicts the variables used in the study. Descriptions of the outcome,

predictor, and control variables, including any transformations of the variables are presented below.

**Outcome/Dependent Variable:** The primary outcome variable for this study is 5<sup>th</sup>-year undergraduate students. This variable was assessed using the Year in School variable in the dataset. Further risk analyses stratified 5<sup>th</sup>-year students by grade point average (GPA) to create two levels of 5<sup>th</sup>-year students- those with A/B GPAs (low risk), and those with C/D/F GPAs (high risk). Utilizing the Social Cognitive Theory-based framework in this study allows analyses to be conducted utilizing any of the three major variables as the outcome variable. This study used 5<sup>th</sup>-year student as the outcome variable because it best reflected this study's research questions and specific aims. Equally important, the selection leads to results framed for practical application by the target audience: college and university personnel. Although alcohol use and mental health issues can be assessed in college students, it requires access to students and added evaluation. Fifth-year student status and grade point average are data readily available to college administrators.

**Predictor/Independent Variables:** The independent variables are organized into two major categories: Alcohol use factors and Mental Health factors, each subcategorized as scope (quantity/frequency of alcohol consumption, experience of mental health issues, and diagnosis of mental health issues), or consequence (consequences of alcohol use, consequences of mental health issues). Many of the variables in the dataset were coded categorically and remain coded as such in the analyses.

Quantity and frequency of alcohol consumption, reported as *Number of drinks consumed during last "party" event*, *Number of hours of alcohol consumption during last*

*‘party’ event*, and *Number of occasions in the past 2 weeks during which the same amount is consumed*, respectively, are continuous variables and will remain as such for the analysis. The remaining two alcohol frequency variables, *Number of occasions in the past 30 days alcohol is used*, and *Number of occasions in the past 2 weeks in which 5 or more drinks are consumed* were collected as categorical data. To report 30 day alcohol use, the response options are: “Never used,” “Have used, but not in last 30 days,” “1-2 days,” “3-5 days,” “6-9 days,” “10-19 days,” “20-29 days,” “All 30 days.” “Never used” and “Have used, but not in last 30 days” were collapsed into “0 days.” For the second variable, responses ranged from “0 days” to “9 or more days.” Given the larger number of possible responses they were descriptively analyzed as continuous data (Mean, Standard Deviation, Independent t-Tests).

Consequences of alcohol use are observed on six variables. The first five, *Within the past year have you experienced: Physical injury to self; Physical injury to another person; Been involved in a fight; Did something you later regretted; and Forgot where you were or what you did* allowed for three possible responses: “Not applicable- Don’t Drink,” “No,” and “Yes.” “Not applicable” and “No” responses were combined to create a dichotomous response (Y/N) variable. The dichotomous response variables were used to provide simple estimates of prevalence of each of the consequences in each population. The final alcohol consequence variable, *Within the last school year has your Academic performance affected by: Alcohol use* allowed for five possible responses: “This did not happen to me- Not applicable,” “I have experienced this issue but my academics have not been affected,” “Received a lower grade on an exam or important study,” “Received a lower grade in the course,” and “Received an incomplete or dropped the course.” These

responses were collapsed into a three-level response variable: No (“This did not happen to me”), Yes, but did not affect GPA (“I have experienced this issue but my academics have not been affected,” “Received a lower grade on an exam or important study,” and “Received an incomplete or dropped the course”), and Yes, did affect GPA (“Received a lower grade in the course”). An overall consequence variable also was calculated and reported.

Scope of mental health issues was measured on two levels, experience of mental health issues and diagnosis of mental health issues, both within the past year. The first group of scope variables represents a continuum of mental health symptoms: feeling overwhelmed, exhausted, very sad, hopeless, depressed, suicidal, and attempting suicide, each measured as the number of times in the past year each has been experienced. Responses range from “Never” to “11 or more times.” Because each of these variables has seven possible responses, these variables were collapsed two ways. One was into a dichotomous response (Y/N) variable. The dichotomous response variables were used to provide simple estimates of prevalence of each of the symptoms in each population. They were subsequently used to create a four-category index: No Symptoms (“No” response to all seven items); Only Mild Symptoms (“Yes” responses to Overwhelmed or Exhausted, “No” responses to all other items); At Least Moderate Symptoms (“Yes” responses to Very sad, Hopeless, and/or Depressed, “No” responses to Felt Suicidal and Attempted Suicide), and At Least Severe Symptoms (“Yes” responses to Felt Suicidal and/or Attempted Suicide). Confirmatory Factor Analysis was used to support the categorical cut points. To simplify the frequency of Mental Health Symptoms, the original 11 response categories also were collapsed into three categories: “Never,” “1-8

times,” and “9 or more times.” These categories correspond to never, less than once per month, and one or more times per month, respectively.

The second and third groups of scope variables assess the same set of mental health issues (Anorexia, Anxiety, Bulimia, Chronic Fatigue, Depression, Seasonal Affective Disorder, and Substance Abuse). The second group assesses whether or not (Y/N) respondents have experienced each in the past year, while the third group assesses whether or not (Y/N) respondents have ever been diagnosed with each issue. In addition to using the separate Experience and Diagnoses variables for overall descriptive data, the variables were combined to create a “Status” variable for each mental health issue. The Status variables are four-level categorical/ordinal variables: “No Experiences/No Diagnoses,” “No Experiences/Yes Diagnoses,” “Yes Experiences/Yes Diagnoses,” and “Yes Experiences/No Diagnoses.” The index represents an increasing level of risk associated with the disorder.

As diagnosis of depression is assessed in two separate questions, a new Depression (Y/N) variable was created to combine respondents who answered “Yes” to either question for overall population descriptive purposes. Descriptive data specific to depression was observed on four items: *Have you ever been diagnosed with Depression;* *Diagnosed with Depression in the last year;* *Currently in therapy for Depression;* and *Currently taking medicine for Depression.* The results of these items are included in the descriptive data, however these variables were not included in subsequent regression analyses.

Ten variables were considered to observe mental health consequences. *Within the last school year has your Academic performance affected by: attention deficit disorder,*



*Concern for family or friend, Death of family member or friend, Depression, eating disorders, Internet use/Computer games, Learning Disability, Relationship difficulty, Sleep difficulty, and stress.* These variables allowed for five possible responses: “This did not happen to me- Not applicable,” “I have experienced this issue but my academics have not been affected,” “Received a lower grade on an exam or important study,” “Received a lower grade in the course,” and “Received an incomplete or dropped the course.” For descriptive purposes, these responses were collapsed into a dichotomous response (Y/N) variable. The dichotomous response variables were used to provide simple estimates of prevalence of each of the consequences in each population. These responses also were collapsed into a three-level response variable: No (“This did not happen to me”), Yes, but did not affect GPA (“I have experienced this issue but my academics have not been affected,” “Received a lower grade on an exam or important project,” and “Received an incomplete or dropped the course”), and Yes, did affect GPA (“Received a lower grade in the course”).

**Control Variables:** The demographic variables used as control variables in the analyses include: sex (male/female), race, international status, current relationship status, living situation, sexual orientation, Greek fraternity/sorority membership, health insurance status, number of hours worked per week, and number of hours volunteered per week. The survey instrument allows respondents to select more than one race category (Non-Hispanic white, Non-Hispanic black, Hispanic, Asian/Pacific Islander, American Indian/Alaska Native, and Other). To create mutually exclusive groups for analyses a new race variable was created to sort respondents into specific categories if they selected only one category. Respondents selecting more than one category were coded as “more

than one race selected” while those not selecting any race categories were coded as “no race selected.”

**Table 2: Names, Types of Data, and Descriptions of Variables used in Analysis**

Variable Name	Type of Data	Description
<i>Dependent Variables</i>		
5 <sup>th</sup> -year student	Y/N	New variable created from existing “year in school” variable
5 <sup>th</sup> -year student GPA	A/B; C/D/F	New variable created from 5 <sup>th</sup> -year student and GPA variables
<i>Independent Variables</i>		
<i>Alcohol Use Variables</i>		
Days of alcohol use during past 30 days	Categorical Range: 0 days-all 30 days	Existing variable Number of days alcohol used the past 30 days
Hours of alcohol use last time “partied”	Continuous	Existing variable Number of hours alcohol consumed the last time a student “partied”
Number of drinks last time “partied”	Continuous	Existing variable Number of alcohol drinks consumed the last time a student “partied”
Number of times in past 2 weeks alcohol consumed	Continuous	Existing variable Number of occasions in past 2 weeks student consumed same or more alcohol as last time “partied” (previous question)
Number of times in past 2 weeks more than 5 drinks consumed	Categorical Range: 0 times-9 or more times	Existing variable Number of occasions in past 2 weeks student has consumed 5 or more drinks
<i>Alcohol Consequence Variables</i>		
Physical injury to self	Categorical Possible responses: 0=No 1=Yes 2=N/A Don’t drink	Existing variable
Physical injury to another person		
Been involved in a fight		
Did something you later regretted		
Forgot where you were or what you did		
Academic performance affected by alcohol use	Categorical Range: This did not happen- Received an incomplete or dropped the course	Existing variable Academic consequences within the last school year
<i>Mental Health Variables</i>		
Last year felt hopeless	Categorical Range: Never-11 or more times	Existing variables Number of times experienced within the last school year
Last year felt overwhelmed		
Last year felt exhausted		
Last year felt very sad		
Last year felt depressed		
Last year felt suicidal		
Last year attempted suicide		
Ever diagnosed with Depression	Y/N	Existing variable Ever been diagnosed with Depression
Diagnosed with Depression in the last year	Y/N	Existing variable Diagnosed within last school year
Currently in therapy for Depression	Y/N	Existing variable Currently in therapy for Depression
Currently taking medicine for Depression	Y/N	Existing variable Current taking medication for Depression

**Table 2 (continued)**

Had Anorexia within last school year	Y/N	Existing variables
Had Anxiety within last school year	Y/N	Have had during the last school year
Had Bulimia within last school year	Y/N	
Had Chronic Fatigue within last school year	Y/N	
Had Depression within last school year	Y/N	
Had seasonal affective disorder within last school year	Y/N	
Had Substance Abuse within last school year	Y/N	
Ever diagnosed Anorexia	Y/N	Existing variables
Ever diagnosed Anxiety	Y/N	Ever diagnosed
Ever diagnosed Bulimia	Y/N	
Ever diagnosed Chronic Fatigue	Y/N	
Ever diagnosed Depression	Y/N	
Ever diagnosed seasonal affective disorder	Y/N	
Ever diagnosed Substance Abuse	Y/N	
Mental Health Consequence Variables (Academic performance)	Range: This did not happen- Received an incomplete or dropped the course	Existing variables Academic consequences within the last school year
Attention Deficit Disorder		
Concern for friend or family member		
Death of friend or family member		
Depression/Anxiety/SAD		
Eating Disorder		
Internet use/computer games		
Learning disability		
Relationship difficulty		
Sleep difficulty		
Stress		
<i>Control Variables</i>		
Sex	Categorical	Existing variable
Female		
Race	Categorical	Variable created to reflect mutually exclusive race categories
White, non-Hispanic		
Black, non-Hispanic		
Hispanic		
Asian/Pacific Islander		
Native American		
Other		
More than 1 Race		
No Race Reported		
International Student	Y/N	Existing variable
Yes		
Sexual Preference	Categorical	Existing variable
Heterosexual		
Gay/Lesbian		
Bisexual		
Transgendered		
Unsure		
Fraternity/Sorority Member	Y/N	Existing variable
Yes		
Living Situation	Categorical	Existing variable
Campus Residence Hall		
Fraternity/Sorority House		
Other college housing		
Off-campus Housing		
Parent/Guardian Home		
Other		
Relationship Status	Categorical	Existing variable
Single		
Married/Domestic Partner		
Engaged/Committed Dating		
Separated		
Divorced		
Widowed		

**Table 2 (continued)**

Health Insurance Status	Categorical	Existing variable
Yes		
No		
Unsure		
Number of Hours Worked per week	Categorical	Existing variable
0		
1-9		
10-19		
20-29		
30-39		
40		
More than 40		
Number of Hours Volunteered per week	Categorical	Existing variable
0		
1-9		
10-19		
20-29		
30-39		
40		
More than 40		

## Data Analysis

The Statistical Package for the Social Sciences (SPSS) v19.0 was used for all data analyses, except where otherwise indicated.

*Specific Aim #1: Examine differences in alcohol use and mental health issues between 5<sup>th</sup>-year students and each year-in-school group (1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup>, and 4<sup>th</sup>-year students);*

Descriptive statistics were calculated to show the rates of alcohol use and mental health variables experienced by each class (1<sup>st</sup>-year, 2<sup>nd</sup>-year, 3<sup>rd</sup> year, 4<sup>th</sup>-year, and 5<sup>th</sup>-year students). Analysis included four pair-wise comparisons of groups (5<sup>th</sup>yr vs. 1<sup>st</sup>yr; 5<sup>th</sup>yr vs. 2<sup>nd</sup>yr; 5<sup>th</sup>yr vs. 3<sup>rd</sup>yr; and 5<sup>th</sup>yr vs. 4<sup>th</sup>yr). Means and Standard Deviations were calculated for the alcohol use variables, and independent t-tests were conducted to compare the alcohol use data between each pair. In general, a significance level of <.05 was desired. However, because of the large size of the dataset used in this study the likelihood of statistical significance among variables is increased. To protect against familywise type I errors due to large sample size, a bonferroni correction was used post

hoc to determine significance level for the alcohol use variables. The  $p < .05$  alpha level was divided by the number of comparisons (10), resulting in  $p < .005$  as the level of statistical significance for the alcohol use variables.<sup>107</sup>

The remainder of the variables were categorical data. Proportions were calculated for each group and chi-square tests were used to determine differences in groups.

Because of the large sample size and the increased chance of a statistically significant difference in group proportions, the Cramer's V statistic also was calculated and used to estimate the effect size or magnitude of the association. The following criteria were used to interpret the Cramer's V statistic. Negligible Association: .00 - .05; Weak Association: .06 - .10; Moderate Association: .11 - .15; Strong Association: .15 - .25; Very Strong Association: .25 and above

(<http://faculty.quinnipiac.edu/libarts/polsci/Statistics.html>).

*Specific Aim #2: Examine differences in alcohol use and mental health issues among 5<sup>th</sup>-year students, by sex, race, and grade point average;*

Descriptive statistics were calculated to show the rates of alcohol use and mental health variables experienced by each group (sex, race, grade point average). Analysis included pair-wise comparison of groups (male vs. female; A/B GPA vs. C/D/F GPA). Means and Standard Deviations were calculated for the alcohol use variables, and Independent t-tests were conducted to compare the alcohol use data between the males and females, and GPA groups. One-way ANOVA was conducted to compare the alcohol use data between the racial groups. In general, a significance level of  $< .05$  was desired. However, because of the large size of the dataset used in this study the likelihood of statistical significance among variables is increased. To protect against familywise type I

errors due to large sample size, a bonferroni correction was used post hoc to determine significance level for the alcohol use variables. The  $p < .05$  alpha level was divided by the number of comparisons (10), resulting in  $p < .005$  as the level of statistical significance for the alcohol use variables.<sup>107</sup>

The remainder of the variables were categorical data. Proportions were calculated for each group and chi-square tests were used to determine differences in groups.

Because of the large sample size and the increased chance of a statistically significant difference in group proportions, the Cramer's V statistic was calculated also and used to estimate the effect size or magnitude of the association. The following criteria were used to interpret the Cramer's V statistic. Negligible Association: .00 - .05; Weak Association: .06 - .10; Moderate Association: .11 - .15; Strong Association: .15 - .25; Very Strong Association: .25 and above

(<http://faculty.quinnipiac.edu/libarts/polsci/Statistics.html>).

*Specific Aim #3: Develop a predictive model of characteristics of at-risk 5<sup>th</sup>-year students.*

Regression analysis was used to determine the predictive factors of alcohol use and mental health issues on at-risk 5<sup>th</sup>-year students. Logistic regression was conducted to determine the magnitude of risk (Odds Ratio) of each independent variable in the model on the outcome variable, 5<sup>th</sup>-year students with C/D/F grade point average. Logistic regression was selected for the analysis due to the dichotomous coding of the outcome variable. Tests of multicollinearity were performed to check for correlation between predictor variables that may reduce the predictive power of that variable on the outcome variable and revealed no such relationships.

*Specific Aim #4: Assess the fit of the proposed conceptual model relating alcohol use and mental health issues to at-risk 5<sup>th</sup>-year students.*

Structural Equation Modeling (SEM) was used to test the fit of the proposed conceptual model. SEM was chosen for its ability to test models in which there is an interaction between predictor variables as well as the ability to measure latent (unobserved) variables in the same model as directly observed variables,<sup>108, 109</sup> particularly in large sample sizes.<sup>108</sup> This analysis tested the interaction effect of both alcohol use and mental health issues (both latent variables) on at-risk 5<sup>th</sup>-year students. As described in the framework, Alcohol use and Mental Health are both constructs comprised of a series of observed or measured variables in the NCHA-I.

Although SEM is generally considered a multi-stage process,<sup>108</sup> because this study proposed a hypothetical model already based on theory and existing literature, only the model evaluation<sup>108</sup> step was used. The model was estimated using AMOS Graphics version 20.0 (SPSS Inc., Chicago, IL). The most common forms of SEM, maximum likelihood (ML) and generalized least squares (GLS) require normally distributed data.<sup>108</sup> Tests of univariate skewness and kurtosis revealed a considerable number of variables with high values, from which multivariate nonnormality of the data set can be inferred. As such, the asymptomatic distribution-free (ADF) estimation method was used in this analysis. While affected by models with large numbers of variables<sup>108</sup> it is the most appropriate for use with very large sample sizes.<sup>108, 109</sup> The model chi-square statistic is most commonly used to assess model fit, however as it is susceptible to large sample sizes, the root mean square error of approximation (RMSEA) and comparative fit index (CFI) goodness-of-fit measures also were used to assess the fit of the model to the data.

Guidelines for acceptable values for the goodness-of-fit indexes are a RMSEA  $\leq 0.06$  and CFI  $\geq 0.95$ .<sup>108</sup>



## CHAPTER 4: RESULTS- YEAR IN SCHOOL COMPARISONS

This chapter presents the results of the year-in-school comparisons. Summary population demographics are presented first. The next set of results are descriptive statistics for the pair-wise year-in-school comparisons (5<sup>th</sup>yr vs. 1<sup>st</sup>yr; 5<sup>th</sup>yr vs. 2<sup>nd</sup>yr; 5<sup>th</sup>yr vs. 3<sup>rd</sup>yr; and 5<sup>th</sup>yr vs. 4<sup>th</sup>yr) on all Alcohol Use, Alcohol Consequences, Mental Health Symptoms, Mental Health Experiences and Diagnoses, and Mental Health Consequence items. Alcohol Use items are presented for all students as well as just drinkers (students who answered at least “1” to each item). As such, all of the results for the 5<sup>th</sup>-year vs. 1<sup>st</sup>-year student analyses are presented first, followed by the 5<sup>th</sup>-year vs. 2<sup>nd</sup>-year student comparison results, the 5<sup>th</sup>-year vs. 3<sup>rd</sup>-year student comparison results, and the 5<sup>th</sup>-year vs. 4<sup>th</sup>-year student comparison results.

### Population Demographics

As shown in Table 3, the mean age of respondents was 20.1 years. First-year students make up the largest group (30%), followed by 2<sup>nd</sup>-year (23.6%), 3<sup>rd</sup>-year students (23.0%), 4<sup>th</sup>-year students (18.4%), and 5<sup>th</sup>-year students (5.0%). Approximately 65% of 1<sup>st</sup>- to 4<sup>th</sup>-year students were female, compared to 58% of 5<sup>th</sup>-year students. Approximately three-fourths of the respondents were White; 4.0-4.9% were Black; 4.4-5.3% were Hispanic; 6.6-8.9% were Asian/Pacific Islander; 0.3-0.5% were Native American; 2.0-2.8% were Other; 3.6-4.1% reported more than 1 race; and 0.6-0.8% reported no race. Almost all of the respondents were Heterosexual (94.4-94.9%).

Analyses of the remainder of the demographic variables revealed between-group variations. While about half of all respondents reported a B grade point average (GPA), 33.6-37.2% of 1<sup>st</sup>- through 4<sup>th</sup>-year students had A GPAs, compared to only 22% of 5<sup>th</sup>-year students. Conversely, 21.9% of 5<sup>th</sup>-year students have C GPAs, compared to only 10-7-13.4% of 1<sup>st</sup>- to 4<sup>th</sup>-year students. As expected, fewer 1<sup>st</sup>-year students (7.1%) were members of Greek fraternities or sororities than 2<sup>nd</sup>- to 5<sup>th</sup>-year students (9.3-11.7%). Overall, about half of the respondents had lived in on-campus housing, though living in off-campus housing increased with year in school as did living with parents. Overall, almost 60% of the respondents were single, though this decreased with year in school. International students represent 3.0-3.5% of 1<sup>st</sup>- to 4<sup>th</sup>-year students and 1.8% of 5<sup>th</sup>-year students. Among all students, approximately 60% have a job. The proportion of students that work increases with year in school, as does the number of hours worked per week. Rates of volunteerism are similar among the year-in-school groups. Fifth-year students were the fewest proportion of students with health insurance (79.9%), compared to 1<sup>st</sup>- to 4<sup>th</sup>-year students (85.9-88.7%).

**Table 3: Demographic Characteristics of Study Population**

	Total Under-graduate Population	Undergraduates by Year in School				
	N=	1 <sup>st</sup> N=	2 <sup>nd</sup> N=	3 <sup>rd</sup> N=	4 <sup>th</sup> N=	5 <sup>th</sup> N=
	373,971	112,416	88,447	85,903	68,617	18,588
	%	%	%	%	%	%
<b>Year in School</b> (Undergraduates only)		30.0	23.6	23.0	18.4	5.0
<b>Sex</b>						
Female	64.8	64.4	65.8	65.3	65.6	58.1
<b>Race</b>						
White, non-Hispanic	75.5	75.1	75.8	75.0	76.5	75.7
Black, non-Hispanic	4.3	4.7	4.2	4.3	4.0	4.9
Hispanic	4.5	4.5	4.4	4.5	4.4	5.3
Asian/Pacific Islander	8.4	8.5	8.3	8.9	8.0	6.6
Native American	0.3	0.3	0.3	0.3	0.3	0.5
Other	2.3	2.1	2.4	2.4	2.5	2.8
More than 1 Race	3.9	4.1	3.9	3.9	3.6	3.6
No Race Reported	0.7	0.7	0.8	0.6	0.7	0.6

**Table 3 (continued)**

<b>Sexual Preference</b>						
Heterosexual	94.6	94.8	94.6	94.6	94.4	94.9
Gay/Lesbian	1.6	1.3	1.6	1.7	1.9	1.7
Bisexual	2.3	2.2	2.3	2.4	2.5	2.3
Transgendered	0.1	0.1	0.1	0.0	0.1	0.1
Unsure	1.4	1.6	1.4	1.3	1.2	1.1
<b>Grade Point Average</b>						
A	34.1	35.0	33.7	33.6	37.2	22.0
B	51.2	49.0	51.6	52.3	51.6	55.1
C	12.6	11.3	13.4	13.0	10.7	21.9
D/F	0.7	1.2	0.7	0.5	0.2	0.6
N/A	1.4	3.5	0.6	0.6	0.4	0.5
<b>Fraternity/Sorority Member</b>						
Yes	10.0	7.1	11.5	11.0	11.7	9.3
<b>Living Situation</b>						
Campus Residence Hall	49.2	83.9	54.7	29.3	21.2	8.4
Fraternity/Sorority House	2.2	0.5	3.6	3.1	2.3	1.0
Other college housing	5.1	0.9	5.7	8.0	8.1	3.6
Off-campus Housing	31.2	4.9	24.8	45.6	55.5	64.9
Parent/Guardian Home	10.6	9.2	9.9	11.5	10.8	17.8
Other	1.7	0.6	1.3	2.5	2.1	4.3
<b>International Student</b>						
Yes	3.2	3.0	3.2	3.5	3.2	1.8
<b>Relationship Status</b>						
Single	59.6	67.1	61.7	56.0	52.5	48.3
Married/Domestic Partner	2.2	0.6	1.3	2.7	3.9	8.2
Engaged/Committed Dating	37.9	32.1	36.8	41.1	43.4	42.9
Separated	0.1	0.1	0.1	0.1	0.1	0.2
Divorced	0.1	0.1	0.1	0.2	0.2	0.3
Widowed	0.0	0.0	0.0	0.0	0.0	0.0
<b>Weekly Work Hours</b>						
0	42.4	60.4	41.9	33.5	29.4	26.0
1-9	19.5	17.9	21.9	20.2	20.1	12.7
10-19	20.8	14.0	21.3	24.5	25.8	23.2
20-29	11.6	5.5	10.3	14.8	16.5	23.2
30-39	3.6	1.6	2.9	4.5	5.3	9.1
40	1.2	0.4	1.0	1.5	1.7	3.4
More than 40	0.8	0.3	0.7	1.0	1.2	2.4
<b>Weekly Volunteer Hours</b>						
0	63.1	67.6	62.0	60.8	59.7	65.6
1-9	33.3	30.6	34.9	35.0	34.6	28.5
10-19	2.6	1.4	2.4	3.1	4.1	3.7
20-29	0.6	0.3	0.5	0.7	1.0	1.3
30-39	0.2	0.1	0.1	0.2	0.3	0.4
40	0.1	0.0	0.0	0.0	0.2	0.2
More than 40	0.1	0.1	0.1	0.1	0.2	0.3
<b>Health Insurance</b>						
Yes	87.2	85.9	88.1	88.2	88.7	79.9
No	6.6	4.6	5.6	7.2	7.7	16.8
Unsure	6.2	9.5	6.3	4.6	3.6	3.3
	Mean	Mean	Mean	Mean	Mean	Mean
	(SD)	(SD)	(SD)	(SD)	(SD)	(SD)
<b>Age (Restricted to 18-26)</b>	20.10	18.52	19.62	20.75	21.67	23.02
	(1.66)	(0.81)	(0.97)	(1.14)	(1.01)	(1.16)

### Fifth-Year Students and First-Year Students

Among all students, 5<sup>th</sup>-year students demonstrated significantly ( $p < 0.005$ ) higher frequency and quantity of consumption of alcohol across all five alcohol use items (Table 4). Fifth-year students consumed alcohol 3-5 of the past 30 days, compared to 1-2 days for 1<sup>st</sup>-year students. Fifth-year students consumed almost five drinks over 3.34 hours to the four drinks over 2.43 hours consumed by 1<sup>st</sup>-year students. Fifth-year students drank the same amount of alcohol as the last time they “partied” an average of 1.28 days in the past 2 weeks, while 1<sup>st</sup>-year students consumed the same amount on 1.12 days in the past 2 weeks. Fifth-year students consumed five or more drinks an average of 1.18 days of the past 14, compared to 0.99 days for 1<sup>st</sup>-year students.

Among students who reported consuming alcohol, a greater proportion of 5<sup>th</sup>-year students reported consuming alcohol on all five items than 1<sup>st</sup>-year students: *Past 30 days use* (77.8% vs. 59.3%); *Hours of alcohol use* (85.3% vs. 67.8%); *Number of drinks consumed* (86.7% vs. 68.9%); *Number of occasions same amount of alcohol consumed in the past 2 weeks* (57.3% vs. 46.6%); and *Number of times in past 2 weeks 5 or more drinks consumed* (43.9% vs. 36.8%). Mean scores indicate that on average, 5<sup>th</sup>-year students drank more often during the past 30 days and drank for more hours than 1<sup>st</sup>-year students, but consumed fewer drinks. Fifth-year students consumed the same amount as the last time they partied an average of 2.23 times, as compared to 2.39 times for 1<sup>st</sup>-year students. Fifth-year and 1<sup>st</sup>-year students consumed five or more drinks in the past 2 weeks an almost identical number of times (2.70 vs. 2.69). Mean scores for 5<sup>th</sup>-year and 1<sup>st</sup>-year students on the alcohol use items were statistically different for all items ( $p < 0.005$ ), except *Number of occasions in past 2 weeks 5 or more drinks consumed*. In

Table 4, positive t-scores indicate greater alcohol use among 5<sup>th</sup>-year students; negative t-scores indicate greater use among 1<sup>st</sup>-year students.

**Table 4: Alcohol Use Behavior Items: Fifth-year Students and First-year Students**

	5 <sup>th</sup> -year Students N = 18,588				1 <sup>st</sup> -year Students N = 112,416			t-test	p
	Range	%	M	SD	%	M	SD		
<b>Alcohol Use Behaviors (all students)</b>									
Days of alcohol use during past 30 days	0-6		2.04	1.56		1.42	1.49	51.69	<.001
Hours of alcohol use last time "partied"	0-14		3.34	2.41		2.43	2.32	49.35	<.001
Number of drinks last time "partied"	0-23		4.92	4.18		4.01	4.13	27.47	<.001
Number of times in past 2 weeks drinking same or more alcohol as last time "partied"	0-10		1.28	1.67		1.12	1.65	12.45	<.001
Number of times in past 2 weeks more than 5 drinks consumed	0-9		1.18	1.86		0.99	1.73	13.13	<.001
<b>Alcohol Use Behaviors (drinkers only)</b>									
Days of alcohol use during past 30 days	1-6	77.8	2.62	1.27	59.3	2.40	1.17	18.93	<.001
Hours of alcohol use last time "partied"	1-14	85.3	3.92	2.13	67.8	3.58	1.95	18.55	<.001
Number of drinks last time "partied"	1-23	86.7	5.67	3.98	68.9	5.81	3.77	-4.07	<.001
Number of times in past 2 weeks drinking same or more alcohol as last time "partied"	1-10	57.3	2.23	1.66	46.6	2.39	1.66	-9.17	<.001
Number of times in past 2 weeks more than 5 drinks consumed	1-9	43.9	2.70	1.94	36.8	2.69	1.87	0.06	.955

Note: Due to the use of bonferroni's correction,  $p < .005$  is used to determine statistical significance. Positive t-scores indicate greater alcohol use among 5<sup>th</sup>-year students; negative t-scores indicate greater use among 1<sup>st</sup>-year students.

As shown in Table 5, 45% of 5<sup>th</sup>-year students experienced at least one consequence of alcohol use as compared to 39% of 1<sup>st</sup>-year students. A greater proportion of 5<sup>th</sup>-year students reported experiencing all of the itemized alcohol-related consequences than 1<sup>st</sup>-year students. All comparisons resulted in a statistically significant chi-square ( $p < 0.05$ ), though the results of the Cramer's V test indicate relatively low effect sizes (Table 6). Only the academic consequence demonstrated a weak effect size. A negligible effect size is indicated on all other consequence items.

**Table 5: Alcohol Use Consequence Items “Yes” Responses: Fifth-year Students and First-year Students**

	5 <sup>th</sup> -year Students N = 18,588	1 <sup>st</sup> -year Students N = 112,416
	%	%
<b>Alcohol Consequences</b>		
Experienced at least 1 Consequence	45.1	39.3
Physical injury to self	16.4	14.6
Physical injury to another person	4.6	3.3
Been involved in a fight	7.1	4.6
Did something you later regretted	33.6	28.0
Forgot where you were or what you did	26.2	24.9
Academic performance affected by alcohol use		
Yes, but did not affect GPA	8.8	5.1
Yes, did affect GPA	2.8	1.4

**Table 6: Alcohol Use Consequence Items “Yes” Responses Comparison: Fifth-year Students and First-year Students**

	X <sup>2</sup>	p	df	Cramer's V	Effect Size Interpretation
<b>Alcohol Consequences</b>					
Experienced at least 1 consequence	219.54	<.001	1	.04	Negligible
Physical injury to self	37.96	<.001	1	.02	Negligible
Physical injury to another person	81.04	<.001	1	.03	Negligible
Been involved in a fight	211.72	<.001	1	.04	Negligible
Did something you later regretted	242.57	<.001	1	.04	Negligible
Forgot where you were or what you did	13.10	<.001	1	.01	Negligible
Academic performance affected by alcohol use	589.56	<.001	2	.07	Weak

Table 7 reports the results for the Yes/No response Mental Health Symptom items. Although a higher proportion of 5<sup>th</sup>-year students experienced only mild symptoms (13.7%) than 1<sup>st</sup>-year students (11.7%), slightly larger proportions of 1<sup>st</sup>-year students experienced at least moderate (74.3%) or severe (10.8%) symptoms than 5<sup>th</sup>-year students. Results varied by individual symptom. Larger proportions of 5<sup>th</sup>-year students report feeling overwhelmed and exhausted. Among the moderate symptoms, slightly more 1<sup>st</sup>-year students reported feeling very sad or hopeless, but more 5<sup>th</sup>-year students reported feeling depressed. For the severe symptoms, more 1<sup>st</sup>-year students reported feeling both suicidal and attempting suicide than 5<sup>th</sup>-year students. All comparisons resulted in a statistically significant chi-square ( $p < 0.05$ ), except for the depressed item

(Table 8). The results of the Cramer's V test indicate negligible effect sizes for all variables.

**Table 7: Mental Health Symptom Items “Yes” Responses: Fifth-year Students and First-year Students**

	5 <sup>th</sup> -year Students N = 18,588	1 <sup>st</sup> -year Students N = 112,416
	%	%
<b>Index of Mental Health Symptoms</b>		
No Symptoms	2.6	3.3
Only Mild Symptoms	13.7	11.7
At least Moderate Symptoms	73.6	74.3
At least Severe Symptoms	10.1	10.8
<b>Mental Health Symptoms</b>		
Last year felt overwhelmed by all you had to do	94.6	93.4
Last year felt exhausted (not from physical activity)	92.4	90.4
Last year felt very sad	79.5	81.0
Last year felt things were hopeless	63.0	64.6
Last year felt so depressed it was difficult to function	44.8	44.1
Last year seriously considered attempting suicide	10.1	10.7
Last year attempted suicide	1.2	1.7

**Table 8: Mental Health Symptom Items “Yes” Responses Comparison: Fifth-year Students and First-year Students**

	X <sup>2</sup>	p	df	Cramer's V	Effect Size Interpretation
<b>Index of Mental Health Symptoms</b>	80.00	<.001	3	.03	Negligible
<b>Mental Health Symptoms</b>					
Last year felt overwhelmed by all you had to do	42.42	<.001	1	.02	Negligible
Last year felt exhausted (not from physical activity)	79.66	<.001	1	.03	Negligible
Last year felt very sad	23.14	<.001	1	.01	Negligible
Last year felt things were hopeless	19.06	<.001	1	.01	Negligible
Last year felt so depressed it was difficult to function	3.27	.071	1	.01	Negligible
Last year seriously considered attempting suicide	5.91	.015	1	.00	Negligible
Last year attempted suicide	21.98	<.001	1	.01	Negligible

Table 9 reports the results of the three-level ordinal frequency response Mental Health Symptoms items. A higher proportion of 5<sup>th</sup>-year students felt overwhelmed and exhausted 9 or more times in the previous school year than 1<sup>st</sup>-year students. First year students were more likely to report feeling overwhelmed and exhausted 1-8 times. For the very sad and hopeless items, more 5<sup>th</sup>-year students reported “never” and “9 times or

more” while more 1<sup>st</sup>-year students reported “1-8 times.” For the Depression item, more 1<sup>st</sup>-year students reported “1-8 times,” but more 5<sup>th</sup>-year students reported “9 or more times.” For the severe symptoms, more 1<sup>st</sup>-year students reported feeling both suicidal (9.5%) and attempting suicide (1.5%) 1-8 times than 5<sup>th</sup>-year students. The same proportions of 1<sup>st</sup>- and 5<sup>th</sup>-year students reported feeling suicidal or attempting suicide 9 or more times. All comparisons resulted in a statistically significant chi-square ( $p < 0.05$ ) (Table 10). The results of the Cramer’s V test indicate weak effect sizes for feeling overwhelmed and exhausted and negligible effect sizes for all other variables.

**Table 9: Mental Health Symptom Items Categorized Responses:  
Fifth-year Students and First-year Students**

	5 <sup>th</sup> -year Students N = 18,588	1 <sup>st</sup> -year Students N = 112,416
	%	%
<b>Mental Health Symptoms</b>		
Last year felt overwhelmed by all you had to do		
Never	5.4	6.6
1-8 times	53.0	61.0
9 or more times	41.7	32.4
Last year felt exhausted (not from physical activity)		
Never	7.6	9.6
1-8 times	53.4	59.1
9 or more times	39.0	31.2
Last year felt very sad		
Never	20.5	19.0
1-8 times	59.6	62.3
9 or more times	19.9	18.7
Last year felt things were hopeless		
Never	37.0	35.4
1-8 times	48.7	51.8
9 or more times	14.3	12.8
Last year felt so depressed it was difficult to function		
Never	55.2	55.9
1-8 times	34.1	35.0
9 or more times	10.6	9.1
Last year seriously considered attempting suicide		
Never	89.9	89.3
1-8 times	8.9	9.5
9 or more times	1.2	1.2
Last year attempted suicide		
Never	98.8	98.3
1-8 times	1.1	1.5
9 or more times	0.1	0.1



**Table 10: Mental Health Symptom Items Categorized Responses Comparison: Fifth-year Students and First-year Students**

	X <sup>2</sup>	p	df	Cramer's V	Effect Size Interpretation
<b>Mental Health Symptoms</b>					
Last year felt overwhelmed by all you had to do	612.82	<.001	2	.07	Weak
Last year felt exhausted (not from physical activity)	460.67	<.001	2	.06	Weak
Last year felt very sad	49.60	<.001	2	.02	Negligible
Last year felt things were hopeless	67.34	<.001	2	.02	Negligible
Last year felt so depressed it was difficult to function	46.59	<.001	2	.02	Negligible
Last year seriously considered attempting suicide	6.19	.045	2	.01	Negligible
Last year attempted suicide	22.74	<.001	2	.01	Negligible

The results for the Depression variables are reported in Table 11. A higher proportion of 5<sup>th</sup>-year students (18.5%) had been diagnosed with Depression than 1<sup>st</sup>-year students (10.6%). However, of those diagnosed with Depression, larger proportions of 1<sup>st</sup>-year students were diagnosed in the last year, are currently in therapy for Depression, and are currently taking medicine for Depression than 5<sup>th</sup>-year students. All comparisons resulted in a statistically significant chi-square ( $p < 0.05$ ), except for the Depression item (Table 12). The results of the Cramer's V test indicate weak effect sizes for the "ever diagnosed" and "diagnosed in the last year" items, and negligible effect sizes on the therapy and medication items.

**Table 11: Depression Diagnosis, Therapy, and Medication Items: Fifth-year students and First-year Students**

	5 <sup>th</sup> -year Students N = 18,588	1 <sup>st</sup> -year Students N = 112,416
	%	%
<b>Depression</b>		
Ever diagnosed with depression	18.5	10.6
	N = 3,399	N = 11,799
	%	%
<b>Of those diagnosed with depression:</b>		
Diagnosed with depression in the last year	31.5	38.4
Currently in therapy for depression	21.9	25.3
Currently taking medicine for depression	33.3	37.3

**Table 12: Depression Diagnosis, Therapy, and Medication Items Comparison: Fifth-year students and First-year Students**

	X <sup>2</sup>	p	df	Cramer's V	Effect Size Interpretation
<b>Mental Health Symptoms</b>					
Ever diagnosed with depression	941.46	<.001	1	.09	Weak
Diagnosed with depression in the last year	54.36	<.001	1	.06	Weak
Currently in therapy for depression	15.74	<.001	1	.03	Negligible
Currently taking medicine for depression	17.62	<.001	1	.03	Negligible

Table 13 reports the results for the Mental Health Experience. A higher proportion of 5<sup>th</sup>-year students experienced Anxiety, Chronic Fatigue Syndrome, Depression, Seasonal Affective Disorder, and Substance Abuse than 1<sup>st</sup>-year students. Larger proportions of 1<sup>st</sup>-year students were observed only for the two Eating Disorders, Anorexia, and Bulimia. All comparisons resulted in a statistically significant chi-square ( $p < 0.05$ ) (Table 14). The results of the Cramer's V test indicate negligible effect sizes for Anorexia, Bulimia, Chronic Fatigue Syndrome, Seasonal Affective Disorder, and Substance Abuse. Weak effect sizes were observed for Anxiety and Depression.

**Table 13: Experience of Mental Health Disorders in Past Year Items: Fifth-year students and First-year Students**

	5 <sup>th</sup> -year Students N = 18,588	1 <sup>st</sup> -year Students N = 112,614
	%	%
<b>Within the past year have you experienced:</b>		
Anorexia	1.3	2.3
Anxiety	15.4	10.1
Bulimia	2.1	2.5
Chronic fatigue	3.9	2.8
Depression	21.4	16.1
Seasonal Affective Disorder	8.2	6.0
Substance abuse	5.3	3.2

**Table 14: Experience of Mental Health Disorders in Past Year Items Comparison: Fifth-year students and First-year Students**

	X <sup>2</sup>	p	df	Cramer's V	Effect Size Interpretation
<b>Within the past year have you experienced:</b>					
Anorexia	77.83	<.001	1	.03	Negligible
Anxiety	447.14	<.001	1	.06	Weak
Bulimia	9.19	.002	1	.01	Negligible
Chronic fatigue	73.62	<.001	1	.02	Negligible
Depression	316.95	<.001	1	.05	Weak
Seasonal Affective Disorder	139.38	<.001	1	.03	Negligible
Substance abuse	217.50	<.001	1	.04	Negligible

Across all seven Mental Health Diagnoses items, higher proportions of 5<sup>th</sup>-year students had been diagnosed than 1<sup>st</sup>-year students (Table 15). Larger group differences were observed on the Anxiety and Depression items. Approximately 10% of 5<sup>th</sup>-year students report a diagnosis of Anxiety as compared to 5.9% of 1<sup>st</sup>-year students. Similarly, 17.5% of 5<sup>th</sup>-year students had been diagnosed with Depression, as compared to 10.1% of 1<sup>st</sup>-year students. Results of the chi-square analysis are presented in Table 16. Statistically significant chi-square values ( $p < 0.05$ ) were observed for all variables except for Anorexia. The results of the Cramer's V test indicate negligible effect sizes for Anorexia, Bulimia, Chronic Fatigue Syndrome, Seasonal Affective Disorder, and Substance Abuse. Weak effect sizes were observed for Anxiety and Depression.

**Table 15: Lifetime Diagnosis of Mental Health Disorders Items: Fifth-year students and First-year Students**

	5 <sup>th</sup> -year Students N = 18,588	1 <sup>st</sup> -year Students N = 112,614
	%	%
<b>Have you ever been diagnosed with:</b>		
Anorexia	2.4	2.2
Anxiety	10.4	5.9
Bulimia	2.3	1.7
Chronic fatigue	1.4	0.9
Depression	17.5	10.1
Seasonal Affective Disorder	2.9	1.9
Substance abuse	2.7	1.3

**Table 16: Lifetime Diagnoses of Mental Health Disorders Items Comparison: Fifth-year students and First-year Students**

	X <sup>2</sup>	p	df	Cramer's V	Effect Size Interpretation
<b>Have you ever been diagnosed with:</b>					
Anorexia	1.25	.263	1	.00	Negligible
Anxiety	518.68	<.001	1	.06	Weak
Bulimia	29.06	<.001	1	.02	Negligible
Chronic fatigue	40.10	<.001	1	.02	Negligible
Depression	839.26	<.001	1	.08	Weak
Seasonal Affective Disorder	74.63	<.001	1	.02	Negligible
Substance abuse	221.24	<.001	1	.04	Negligible

Table 17 reports the results for Mental Health Status. Forty percent of 5<sup>th</sup>-year students report at least one experience or diagnosis, compared to 30.2% of 1<sup>st</sup>-year students. A higher proportion of 5<sup>th</sup>-year students reported being most at-risk (Yes experience/No diagnosis) across all items, with the exception of the Eating Disorder items. The largest group differences were observed for Anxiety, Seasonal Affective Disorder, and Substance Abuse. Although more 5<sup>th</sup>-year students reported a diagnosis of Anorexia more 1<sup>st</sup>-year students reported experiencing the disorder in the past year, with and without a diagnosis. Similar results were observed for Bulimia. Statistically significant chi-square values ( $p < 0.05$ ) were observed for all items (Table 18). The results of the Cramer's V test indicate negligible effect sizes for Anorexia, Bulimia, Chronic Fatigue Syndrome, and Seasonal Affective Disorder. Weak effect sizes were observed for Anxiety and Depression, and Substance Abuse.

**Table 17: Status of Mental Health Disorders: Fifth-year students and First-year Students**

	5 <sup>th</sup> -year Students N = 18,588	1 <sup>st</sup> -year Students N = 112,614
	%	%
<b>Overall Status</b>		
At least 1 Experiences or Diagnosis	40.1	30.2

**Table 17 (continued)**

<b>Disorder</b>		
<b>Anorexia</b>		
No Experiences /No Diagnosis	96.9	96.3
No Experiences /Yes Diagnosis	1.8	1.3
Yes Experiences /Yes Diagnosis	0.5	0.9
Yes Experiences /No Diagnosis	0.8	1.5
<b>Anxiety</b>		
No Experiences /No Diagnosis	82.3	88.7
No Experiences /Yes Diagnosis	2.2	1.2
Yes Experiences /Yes Diagnosis	8.2	4.7
Yes Experiences /No Diagnosis	7.2	5.4
<b>Bulimia</b>		
No Experiences /No Diagnosis	96.4	96.7
No Experiences /Yes Diagnosis	1.4	0.8
Yes Experiences /Yes Diagnosis	0.9	0.8
Yes Experiences /No Diagnosis	1.3	1.7
<b>Chronic fatigue</b>		
No Experiences /No Diagnosis	95.6	97.0
No Experiences /Yes Diagnosis	0.4	0.3
Yes Experiences /Yes Diagnosis	1.0	0.7
Yes Experiences /No Diagnosis	2.9	2.1
<b>Depression</b>		
No Experiences /No Diagnosis	72.5	80.8
No Experiences /Yes Diagnosis	5.9	3.0
Yes Experiences /Yes Diagnosis	11.6	7.2
Yes Experiences /No Diagnosis	9.9	9.0
<b>Seasonal Affective Disorder</b>		
No Experiences /No Diagnosis	91.1	93.7
No Experiences /Yes Diagnosis	0.6	0.4
Yes Experiences /Yes Diagnosis	2.3	1.6
Yes Experiences /No Diagnosis	6.0	4.4
<b>Substance abuse</b>		
No Experiences /No Diagnosis	93.1	96.2
No Experiences /Yes Diagnosis	1.5	0.6
Yes Experiences /Yes Diagnosis	1.2	0.7
Yes Experiences /No Diagnosis	4.1	2.5

**Table 18: Status of Mental Health Disorders Comparison: Fifth-year students and First-year Students**

	X <sup>2</sup>	p	df	Cramer's V	Effect Size Interpretation
<b>Overall Status</b>					
At least 1 Experience or Diagnosis	677.39	<.001	1	.07	Weak
<b>Disorder:</b>					
Anorexia	102.03	<.001	3	.03	Negligible
Anxiety	660.45	<.001	3	.07	Weak
Bulimia	69.37	<.001	3	.02	Negligible
Chronic fatigue	86.86	<.001	3	.03	Negligible
Depression	923.73	<.001	3	.09	Weak
Seasonal Affective Disorder	162.70	<.001	3	.04	Negligible
Substance abuse	381.96	<.001	3	.06	Weak

As shown in Table 19, 58.5% of 5<sup>th</sup>-year students experienced at least one mental health related consequence as compared to 52.6% of 1<sup>st</sup>-year students. A greater

proportion of 5<sup>th</sup>-year students reported experiencing all of the itemized mental health related consequences than 1<sup>st</sup>-year students, with the exception of Internet use/Computer games. All comparisons resulted in a statistically significant chi-square ( $p < 0.05$ ), except for Eating Disorders. The results of the Cramer's V test indicate the relationships were weak at best (Table 20). ADD, Concern for another, Death of friend or family member, Depression, Learning Disability, Relationship difficulties, and Stress demonstrated a weak effect size. A negligible effect size is indicated on all other consequence items.

**Table 19: Mental Health Consequences on Academic Performance Items “Yes Responses”: Fifth-year students and First-year Students**

	5 <sup>th</sup> -year Students N = 18,588	1 <sup>st</sup> -year Students N = 112,614
	%	%
<b>Academic Performance Affected by:</b>		
Experienced at least 1 Consequence	58.5	52.6
Attention Deficit Disorder	9.6	6.2
Concern for friend or family member	21.9	16.5
Death of friend or family member	11.7	7.6
Depression/Anxiety/SAD	20.2	12.8
Eating Disorder	1.4	1.3
Internet use/computer games	14.2	17.5
Learning disability	5.7	2.9
Relationship difficulty	19.7	13.8
Sleep difficulty	27.8	26.2
Stress	37.4	31.4

**Table 20: Mental Health Consequences on Academic Performance Items “Yes” Responses Comparison: Fifth-year students and First-year Students**

	X <sup>2</sup>	p	df	Cramer's V	Effect Size Interpretation
<b>Academic Performance Affected by:</b>					
Experienced at least 1 Consequence	218.05	<.001	1	.04	Negligible
Attention Deficit Disorder	291.80	<.001	1	.05	Weak
Concern for friend or family member	311.23	<.001	1	.05	Weak
Death of friend or family member	348.99	<.001	1	.05	Weak
Depression/Anxiety/SAD	720.32	<.001	1	.08	Weak
Eating Disorder	0.34	.560	1	.00	Negligible
Internet use/computer games	121.73	<.001	1	.03	Negligible
Learning disability	389.48	<.001	1	.06	Weak
Relationship difficulty	435.83	<.001	1	.06	Weak
Sleep difficulty	18.62	<.001	1	.01	Negligible
Stress	257.05	<.001	1	.05	Weak

Results were calculated for the Mental Health Consequences variables expanded to report the impact of the consequence on grade point average. As shown in Table 21, the results mirror those of the previous table with greater proportion of 5<sup>th</sup>-year students reporting experiencing a lowered GPA as a result of all of the itemized consequences than 1<sup>st</sup>-year students, with the exception of Internet use/Computer games. With the exception of Eating Disorders, all comparisons resulted in a statistically significant ( $p < 0.05$ ) chi-square, though the results of the Cramer's V test indicate the relationships were weak at best (Table 22). ADD, Concern for another, Death of friend or family member, Depression, Learning Disability, Relationship difficulties, and Stress demonstrated a weak effect size. A negligible effect size is indicated on all other consequence items.

**Table 21: Mental Health Consequences on Academic Performance Categorized “Yes” Responses: Fifth-year students and First-year Students**

	5 <sup>th</sup> -year Students N = 18,588	1 <sup>st</sup> -year Students N = 112,614
	%	%
<b>Academic Performance Affected by:</b>		
Attention Deficit Disorder		
Yes, but did not affect GPA	5.7	3.8
Yes, did affect GPA	3.9	2.4
Concern for friend or family member		
Yes, but did not affect GPA	17.0	13.8
Yes, did affect GPA	4.9	2.8
Death of friend or family member		
Yes, but did not affect GPA	8.1	5.8
Yes, did affect GPA	3.6	1.8
Depression/Anxiety/SAD		
Yes, but did not affect GPA	13.4	8.6
Yes, did affect GPA	6.8	4.2
Eating Disorder		
Yes, but did not affect GPA	1.0	0.9
Yes, did affect GPA	0.4	0.4
Internet use/computer games		
Yes, but did not affect GPA	10.9	13.8
Yes, did affect GPA	3.2	3.6
Learning disability		
Yes, but did not affect GPA	3.2	1.7
Yes, did affect GPA	2.4	1.1

**Table 21 (continued)**

Relationship difficulty		
Yes, but did not affect GPA	14.4	11.0
Yes, did affect GPA	5.3	2.8
Sleep difficulty		
Yes, but did not affect GPA	21.6	21.2
Yes, did affect GPA	6.2	5.0
Stress		
Yes, but did not affect GPA	27.5	24.8
Yes, did affect GPA	9.9	6.7

**Table 22: Mental Health Consequences on Academic Performance Categorized “Yes” Responses Comparison: Fifth-year students and First-year Students**

	X <sup>2</sup>	p	df	Cramer's V	Effect Size Interpretation
<b>Academic Performance Affected by:</b>					
Attention Deficit Disorder	294.63	<.001	2	.05	Weak
Concern for friend or family member	390.93	<.001	2	.06	Weak
Death of friend or family member	405.75	<.001	2	.06	Weak
Depression/Anxiety/SAD	723.31	<.001	2	.08	Weak
Eating Disorder	0.38	.829	2	.00	Negligible
Internet use/computer games	127.74	<.001	2	.03	Negligible
Learning disability	396.69	<.001	2	.06	Weak
Relationship difficulty	536.46	<.001	2	.07	Weak
Sleep difficulty	45.62	<.001	2	.02	Negligible
Stress	358.44	<.001	2	.05	Weak

#### Fifth-Year Students and Second-Year Students

Among all students, 5<sup>th</sup>-year students demonstrated higher frequency and quantity of consumption of alcohol than 2<sup>nd</sup>-year students (Table 23). Fifth-year students consumed alcohol 3-5 of the past 30 days, compared to 1-2 days for 2<sup>nd</sup>-year students. Fifth-year students drank an average of 4.92 drinks over 3.34 hours compared to 4.36 drinks across 2.79 hours by 2<sup>nd</sup>-year students. Fifth-year students consumed the same amount of alcohol as the last time they “partied” an average of 1.28 days in the past 2 weeks, while 2<sup>nd</sup>-year students consumed the same amount on 1.18 days of the past 14. Fifth-year students consumed five or more drinks an average of 1.18 days during the past 2 weeks, compared to 1.08 days for 2<sup>nd</sup>-year students.

Among students who reported consuming alcohol, a greater proportion of 5<sup>th</sup>-year students reported consuming alcohol on all five items than 2<sup>nd</sup>-year students: *Past 30*



*days use* (77.8% vs. 65.7%); *Hours of alcohol use* (85.3% vs. 74.5%); *Number of drinks consumed* (86.7% vs. 75.5%); *Number of occasions same amount of alcohol consumed in the past 2 weeks* (57.3% vs. 50.9%); and *Number of times in past 2 weeks 5 or more drinks consumed* (43.9% vs. 40.0%). Mean scores indicate that on average, 5<sup>th</sup>-year students drank more often during the past 30 days and drank more hours than 2<sup>nd</sup>-year students, but consumed fewer drinks (M=5.67) than 2<sup>nd</sup>-year students (M=5.77). Fifth-year students consumed the same amount as the last time they partied an average of 2.23 times during the past 2 weeks, as compared to 2.32 times for 2<sup>nd</sup>-year students. Fifth-year and 2<sup>nd</sup>-year students consumed five or more drinks in the past 2 weeks an identical number of times (M=2.70). Mean scores for 5<sup>th</sup>-year and 2<sup>nd</sup>-year students on the alcohol use items were statistically different for all items, except *Number of occasions in past 2 weeks 5 or more drinks consumed*. In Table 23, positive t-scores indicate greater alcohol use among 5<sup>th</sup>-year students; negative t-scores indicate greater use among 2<sup>nd</sup>-year students.

As shown in Table 24, 45.1% of 5<sup>th</sup>-year students experienced at least one consequence of alcohol use as compared to 43.5% of 2<sup>nd</sup>-year students. A greater proportion of 5<sup>th</sup>-year students reported the following consequences: *Physical injury to another person*, *Been involved in a fight*, *Did something you later regretted*, and *Academic performance affected by alcohol use*; than 2<sup>nd</sup>-year students. Second-year students were more likely to report *Physical injury to self* and *Forgetting where they were or what they did*. All comparisons resulted in a statistically significant chi-square ( $p < 0.05$ ), though the results of the Cramer's V test indicate negligible effect sizes (Table 25).

**Table 23: Alcohol Use Behavior Items: Fifth-year Students and Second-year Students**

			5 <sup>th</sup> -year Students N = 18,588		2 <sup>nd</sup> -year Students N = 88,447		t-test	p	
	Range	%	M	SD	%	M			SD
<b>Alcohol Use Behaviors (all students)</b>									
Days of alcohol use during past 30 days	0-6		2.04	1.56		1.59	1.49	36.87	<.001
Hours of alcohol use last time "partied"	0-14		3.34	2.41		2.79	2.36	28.86	<.001
Number of drinks last time "partied"	0-23		4.92	4.18		4.36	4.10	16.74	<.001
Number of times in past 2 weeks drinking same or more alcohol as last time "partied"	0-10		1.28	1.67		1.18	1.62	7.44	<.001
Number of times in past 2 weeks more than 5 drinks consumed	0-9		1.18	1.86		1.08	1.78	7.12	<.001
<b>Alcohol Use Behaviors (drinkers only)</b>									
Days of alcohol use during past 30 days	1-6	77.8	2.62	1.27	65.7	2.41	1.18	17.32	<.001
Hours of alcohol use last time "partied"	1-14	85.3	3.92	2.13	74.5	3.74	1.98	9.54	<.001
Number of drinks last time "partied"	1-23	86.7	5.67	3.98	75.5	5.77	3.75	-2.81	.005
Number of times in past 2 weeks drinking same or more alcohol as last time "partied"	1-10	57.3	2.23	1.66	50.9	2.32	1.59	-5.08	<.001
Number of times in past 2 weeks more than 5 drinks consumed	1-9	43.9	2.70	1.94	40.0	2.70	1.88	-0.04	.968

Note: Due to the use of bonferroni's correction,  $p < .005$  is used to determine statistical significance. Positive t-scores indicate greater alcohol use among 5<sup>th</sup>-year students; negative t-scores indicate greater use among 2<sup>nd</sup>-year students

**Table 24: Alcohol Use Consequence Items "Yes" Responses: Fifth-year Students and Second-year Students**

	5 <sup>th</sup> -year Students N = 18,588	2 <sup>nd</sup> -year Students N = 88,447
	%	%
<b>Alcohol Consequences</b>		
Experienced at least 1 Consequence	45.1	43.5
Physical injury to self	16.4	17.2
Physical injury to another person	4.6	3.8
Been involved in a fight	7.1	5.8
Did something you later regretted	33.6	31.5
Forgot where you were or what you did	26.2	27.3
Academic performance affected by alcohol use		
Yes, but did not affect GPA	8.8	6.9
Yes, did affect GPA	2.8	2.2

**Table 25: Alcohol Use Consequence Items "Yes" Responses Comparison: Fifth-year Students and Second-year Students**

	X <sup>2</sup>	p	df	Cramer's V	Effect Size Interpretation
<b>Alcohol Consequences</b>					
Experienced at least 1 Consequence	15.08	<.001	1	.01	Negligible
<b>Alcohol Consequences</b>					
Physical injury to self	7.96	<.001	1	.01	Negligible
Physical injury to another person	22.36	<.001	1	.02	Negligible
Been involved in a fight	50.05	<.001	1	.02	Negligible
Did something you later regretted	29.38	<.001	1	.02	Negligible
Forgot where you were or what you did	9.57	<.001	1	.01	Negligible
Academic performance affected by alcohol use	105.18	<.001	2	.03	Negligible

Table 26 reports the results for the Mental Health Symptom variables that were coded as dichotomous Yes/No responses. Although a higher proportion of 5<sup>th</sup>-year students experienced only mild symptoms (13.7%) than 2<sup>nd</sup>-year students (11.6%), slightly larger proportions of 2<sup>nd</sup>-year students experienced at least moderate (75.4%) or severe (10.5%) symptoms than 5<sup>th</sup>-year students. Results for individual symptoms were nearly identical between groups for the Moderate and Severe symptoms. The greatest variation was seen among the moderate symptoms: slightly more 2<sup>nd</sup>-year students reported feeling very sad, hopeless, and depressed than 5<sup>th</sup>-year students. Statistically significant chi-square values ( $p < 0.05$ ) were observed for the overall index, feeling very sad, hopeless, depressed, and attempted suicide (Table 27). The results of the Cramer's V test indicate negligible effect size for all variables.

**Table 26: Mental Health Symptom Items “Yes” Responses: Fifth-year Students and Second-year Students**

	5 <sup>th</sup> -year Students N = 18,588	2 <sup>nd</sup> -year Students N = 88,447
	%	%
<b>Index of Mental Health Symptoms</b>		
No Symptoms	2.6	2.6
Only Mild Symptoms	13.7	11.6
At least Moderate Symptoms	73.6	75.4
At least Severe Symptoms	10.1	10.5
<b>Mental Health Symptoms</b>		
Last year felt overwhelmed by all you had to do	94.6	94.8
Last year felt exhausted (not from physical activity)	92.4	92.3
Last year felt very sad	79.5	81.9
Last year felt things were hopeless	63.0	65.8
Last year felt so depressed it was difficult to function	44.8	45.6
Last year seriously considered attempting suicide	10.1	10.3
Last year attempted suicide	1.2	1.4

**Table 27: Mental Health Symptom Items “Yes” Responses: Fifth-year Students and Second-year Students**

	X <sup>2</sup>	p	df	Cramer’s V	Effect Size Interpretation
<b>Index of Mental Health Symptoms</b>	40.53	<.001	3	.02	Negligible
<b>Mental Health Symptoms</b>					
Last year felt overwhelmed by all you had to do	0.78	.376	1	.00	Negligible
Last year felt exhausted (not from physical activity)	0.31	.578	1	.00	Negligible
Last year felt very sad	58.92	<.001	1	.02	Negligible
Last year felt things were hopeless	54.18	<.001	1	.02	Negligible
Last year felt so depressed it was difficult to function	4.16	.041	1	.01	Negligible
Last year seriously considered attempting suicide	1.09	.297	1	.00	Negligible
Last year attempted suicide	6.07	.014	1	.01	Negligible

For the Mental Health Symptoms variables coded as three-level ordinal frequency responses, a higher proportion of 5<sup>th</sup>-year students felt overwhelmed and exhausted 9 or more times in the previous school year than 2<sup>nd</sup>-year students (Table 28). Second year students were more likely to report feeling overwhelmed and exhausted 1-8 times. For the very sad item, more 5<sup>th</sup>-year students reported never and 9 times or more while more 2<sup>nd</sup>-year students reported 1-8 times. A similar pattern emerged for the hopelessness item. For the Depression item, more 2<sup>nd</sup>-year students reported 1-8 times, but more 5<sup>th</sup>-year students reported 9 or more times. For the severe symptoms, more 2<sup>nd</sup>-year students reported feeling both suicidal and attempting suicide 1-8 times than 5<sup>th</sup>-year students. The proportions of students feeling suicidal or attempting suicide 9 or more times were the same for both groups. All of the mild and moderate symptom comparisons resulted in a statistically significant chi-square ( $p < 0.05$ ), but not the severe symptoms (Table 29). The results of the Cramer’s V test indicate negligible effect sizes for all variables.

**Table 28: Mental Health Symptom Items Categorized Responses: Fifth-year Students and Second-year Students**

	5 <sup>th</sup> -year Students N = 18,588	2 <sup>nd</sup> -year Students N = 88,447
	%	%
<b>Mental Health Symptoms</b>		
Last year felt overwhelmed by all you had to do		
Never	5.4	5.2
1-8 times	53.0	56.8
9 or more times	41.7	38.1
Last year felt exhausted (not from physical activity)		
Never	7.6	7.7
1-8 times	53.4	56.8
9 or more times	39.0	35.5
Last year felt very sad		
Never	20.5	18.1
1-8 times	59.6	62.5
9 or more times	19.9	19.4
Last year felt things were hopeless		
Never	37.0	34.2
1-8 times	48.7	52.1
9 or more times	14.3	13.7
Last year felt so depressed it was difficult to function		
Never	55.2	54.4
1-8 times	34.1	35.9
9 or more times	10.6	9.7
Last year seriously considered attempting suicide		
Never	89.9	89.7
1-8 times	8.9	9.1
9 or more times	1.2	1.2
Last year attempted suicide		
Never	98.8	98.6
1-8 times	1.1	1.3
9 or more times	0.1	0.1

**Table 29: Mental Health Symptom Items Categorized Responses: Fifth-year Students and Second-year Students**

	X <sup>2</sup>	p	df	Cramer's V	Effect Size Interpretation
<b>Mental Health Symptoms</b>					
Last year felt overwhelmed by all you had to do	92.17	<.001	2	.03	Negligible
Last year felt exhausted (not from physical activity)	82.25	<.001	2	.03	Negligible
Last year felt very sad	69.67	<.001	2	.03	Negligible
Last year felt things were hopeless	72.93	<.001	2	.03	Negligible
Last year felt so depressed it was difficult to function	29.96	<.001	2	.02	Negligible
Last year seriously considered attempting suicide	1.13	.568	2	.00	Negligible
Last year attempted suicide	7.32	.026	2	.01	Negligible

Table 30 reports the results for the Depression variables. A larger proportion of 5<sup>th</sup>-year students (18.5%) had been diagnosed with Depression than 2<sup>nd</sup>-year students

(12.5%). However, of those diagnosed with Depression, larger proportions of 2<sup>nd</sup>-year students were diagnosed in the last year, are currently in therapy for Depression, and are currently taking medicine for Depression than 5<sup>th</sup>-year students. All comparisons resulted in a statistically significant chi-square ( $p < 0.05$ ) (Table 31). The results of the Cramer's V test indicate weak effect sizes for the ever diagnosed and diagnosed in the last year items, and negligible effect sizes on the therapy and medication items.

**Table 30: Depression Diagnosis, Therapy, and Medication Items: Fifth-year students and Second-year Students**

	5 <sup>th</sup> -year Students N = 18,588	2 <sup>nd</sup> -year Students N = 88,447
	%	%
<b>Depression</b>		
Ever diagnosed with depression	18.5	12.5
	N = 3,399	N = 10,969
	%	%
<b>Of those diagnosed with depression:</b>		
Diagnosed with depression in the last year	31.5	39.3
Currently in therapy for depression	21.9	25.5
Currently taking medicine for depression	33.3	36.9

**Table 31: Depression Diagnosis, Therapy, and Medication Items Comparisons: Fifth-year students and Second-year Students**

	X <sup>2</sup>	p	df	Cramer's V	Effect Size Interpretation
<b>Mental Health Symptoms</b>					
Ever diagnosed with depression	458.48	<.001	1	.07	Weak
Diagnosed with depression in the last year	67.30	<.001	1	.07	Weak
Currently in therapy for depression	17.92	<.001	1	.04	Negligible
Currently taking medicine for depression	14.22	<.001	1	.03	Negligible

For the Mental Health Experience items, a higher proportion of 5<sup>th</sup>-year students experienced Anxiety, Chronic Fatigue Syndrome, Depression, Seasonal Affective Disorder, and Substance Abuse than 2<sup>nd</sup>-year students (Table 32). Larger proportions of 2<sup>nd</sup>-year students were observed only for the two Eating Disorders; Anorexia and

Bulimia. All comparisons resulted in a statistically significant chi-square ( $p < 0.05$ ) (Table 33). The results of the Cramer's V test indicate negligible effect sizes for all items.

**Table 32: Experiences of Mental Health Disorders in Past Year Items: Fifth-year students and Second-year Students**

	5 <sup>th</sup> -year Students N = 18,588	2 <sup>nd</sup> -year Students N = 88,447
	%	%
<b>Within the past year have you experienced:</b>		
Anorexia	1.3	2.3
Anxiety	15.4	12.1
Bulimia	2.1	2.6
Chronic fatigue	3.9	3.2
Depression	21.4	17.7
Seasonal Affective Disorder	8.2	7.3
Substance abuse	5.3	3.7

**Table 33: Experiences of Mental Health Disorders in Past Year Items Comparison: Fifth-year students and Second-year Students**

	X <sup>2</sup>	p	df	Cramer's V	Effect Size Interpretation
<b>Within the past year have you experienced:</b>					
Anorexia	72.18	<.001	1	.03	Negligible
Anxiety	148.32	<.001	1	.04	Negligible
Bulimia	14.55	<.001	1	.01	Negligible
Chronic fatigue	26.83	<.001	1	.02	Negligible
Depression	144.39	<.001	1	.04	Negligible
Seasonal Affective Disorder	21.72	<.001	1	.01	Negligible
Substance abuse	112.53	<.001	1	.03	Negligible

Across all seven Mental Health Diagnoses items (Table 34), higher proportions of 5<sup>th</sup>-year students had been diagnosed than 2<sup>nd</sup>-year students, except for Anorexia, in which there was an identical proportion. Larger group differences were observed on the Anxiety and Depression items. Approximately 10% of 5<sup>th</sup>-year students report a diagnosis of Anxiety as compared to 7.3% of 2<sup>nd</sup>-year students. Similarly, 17.5% of 5<sup>th</sup>-year students had been diagnosed with Depression, as compared to 12.1% of 2<sup>nd</sup>-year students. Statistically significant chi-square values ( $p < 0.05$ ) were observed for all variables except for Anorexia (Table 35). The results of the Cramer's V test indicate

negligible effect sizes for Anorexia, Anxiety, Bulimia, Chronic Fatigue Syndrome, Seasonal Affective Disorder, and Substance Abuse. A weak effect size was observed for Depression.

**Table 34: Lifetime Diagnosis of Mental Health Disorder Items: Fifth-year students and Second-year Students**

	5 <sup>th</sup> -year Students N = 18,588	2 <sup>nd</sup> -year Students N = 88,447
	%	%
<b>Have you ever been diagnosed with:</b>		
Anorexia	2.4	2.4
Anxiety	10.4	7.3
Bulimia	2.3	1.9
Chronic fatigue	1.4	1.1
Depression	17.5	12.1
Seasonal Affective Disorder	2.9	2.1
Substance abuse	2.7	1.5

**Table 35: Lifetime Diagnoses of Mental Health Disorder Items Comparison: Fifth-year students and Second-year Students**

	X <sup>2</sup>	p	df	Cramer's V	Effect Size Interpretation
<b>Have you ever been diagnosed with:</b>					
Anorexia	.15	.697	1	.00	Negligible
Anxiety	199.24	<.001	1	.04	Negligible
Bulimia	7.99	.005	1	.01	Negligible
Chronic fatigue	20.91	<.001	1	.01	Negligible
Depression	386.59	<.001	1	.06	Weak
Seasonal Affective Disorder	44.94	<.001	1	.02	Negligible
Substance abuse	129.36	<.001	1	.04	Negligible

For the Mental Health Status items (Table 36), 40% of 5<sup>th</sup>-year students report at least one experience or diagnosis, compared to 33.6% of 2<sup>nd</sup>-year students. A higher proportion of 5<sup>th</sup>-year students reported being most at-risk (Yes experience/No diagnosis) across all items, except for the Anorexia and Bulimia. The largest group differences were observed for Anxiety, Seasonal Affective Disorder, and Substance Abuse. Although more 5<sup>th</sup>-year students reported a diagnosis of Anorexia, the same proportion of 2<sup>nd</sup>- and 5<sup>th</sup>-year students experienced the disorder in the past year, with and without a diagnosis.



Similar results were observed for Bulimia. Chi-square values were significant ( $p < 0.05$ ) for all items (Table 37). The Cramer's V test indicate negligible effect sizes for Anorexia, Bulimia, Chronic Fatigue Syndrome, and Seasonal Affective Disorder. Weak effect sizes were observed for Anxiety, Depression, and Substance Abuse.

**Table 36: Status of Mental Health Disorders in Past Year: Fifth-year students and Second-year Students**

	5 <sup>th</sup> -year Students N = 18,588	2 <sup>nd</sup> -year Students N = 88,447
	%	%
<b>Overall Status</b>		
At least 1 Experience or Diagnosis	40.1	33.6
<b>Disorder</b>		
<b>Anorexia</b>		
No Experiences/No Diagnosis	96.9	96.2
No Experiences /Yes Diagnosis	1.8	1.5
Yes Experiences /Yes Diagnosis	0.5	0.9
Yes Experiences /No Diagnosis	0.8	1.4
<b>Anxiety</b>		
No Experiences/No Diagnosis	82.3	86.7
No Experiences /Yes Diagnosis	2.2	1.2
Yes Experiences /Yes Diagnosis	8.2	6.1
Yes Experiences /No Diagnosis	7.2	6.0
<b>Bulimia</b>		
No Experiences/No Diagnosis	96.4	96.4
No Experiences /Yes Diagnosis	1.4	1.0
Yes Experiences /Yes Diagnosis	0.9	1.0
Yes Experiences /No Diagnosis	1.3	1.7
<b>Chronic fatigue</b>		
No Experiences/No Diagnosis	95.6	96.5
No Experiences /Yes Diagnosis	0.4	0.3
Yes Experiences /Yes Diagnosis	1.0	0.8
Yes Experiences /No Diagnosis	2.9	2.4
<b>Depression</b>		
No Experiences/No Diagnosis	72.5	78.7
No Experiences /Yes Diagnosis	5.9	3.5
Yes Experiences /Yes Diagnosis	11.6	8.5
Yes Experiences /No Diagnosis	9.9	9.2
<b>Seasonal Affective Disorder</b>		
No Experiences/No Diagnosis	91.1	92.3
No Experiences /Yes Diagnosis	0.6	0.4
Yes Experiences /Yes Diagnosis	2.3	1.8
Yes Experiences /No Diagnosis	6.0	5.5
<b>Substance abuse</b>		
No Experiences/No Diagnosis	93.1	95.6
No Experiences /Yes Diagnosis	1.5	0.8
Yes Experiences /Yes Diagnosis	1.2	0.8
Yes Experiences /No Diagnosis	4.1	2.9

**Table 37: Status of Mental Health Disorders in Past Year Comparison: Fifth-year students and Second-year Students**

	X <sup>2</sup>	p	df	Cramer's V	Effect Size Interpretation
<b>Overall Status</b>					
At least one Experience or Diagnosis	271.73	<.001	1	.05	Weak
<b>Disorder:</b>					
Anorexia	77.33	<.001	3	.03	Negligible
Anxiety	283.12	<.001	3	.05	Weak
Bulimia	41.61	<.001	3	.02	Negligible
Chronic fatigue	34.61	<.001	3	.02	Negligible
Depression	447.18	<.001	3	.07	Weak
Seasonal Affective Disorder	52.69	<.001	3	.02	Negligible
Substance abuse	206.66	<.001	3	.05	Weak

As shown in Table 38, 58.5% of 5<sup>th</sup>-year students experienced at least one mental health related consequence as compared to 58.0% of 2<sup>nd</sup>-year students. A greater proportion of 5<sup>th</sup>-year students reported experiencing all of the itemized mental health-related consequences than 2<sup>nd</sup>-year students, with the exception of Eating Disorders, Internet use/Computer games, and Sleep difficulty. With the exception of overall experience of consequences, Eating Disorders, and Sleep difficulty, all comparisons resulted in a statistically significant chi-square ( $p < 0.05$ ) (Table 39), though the results of the Cramer's V test indicate the relationships were mostly negligible. A weak effect size was observed for Learning Disability.

**Table 38: Mental Health Consequences on Academic Performance "Yes" Responses: Fifth-year students and Second-year Students**

	5 <sup>th</sup> -year Students N = 18,588	2 <sup>nd</sup> -year Students N = 88,447
	%	%
<b>Academic Performance Affected by:</b>		
Experienced at least 1 Consequence	58.5	58.0
Attention Deficit Disorder	9.6	7.2
Concern for friend or family member	21.9	20.3
Death of friend or family member	11.7	9.6
Depression/Anxiety/SAD	20.2	16.1
Eating Disorder	1.4	1.5
Internet use/computer games	14.2	17.5
Learning disability	5.7	3.3

**Table 38 (continued)**

Relationship difficulty	19.7	17.6
Sleep difficulty	27.8	28.1
Stress	37.4	36.4

**Table 39: Mental Health Consequences on Academic Performance “Yes” Responses  
Comparison: Fifth-year students and Second-year Students**

	X <sup>2</sup>	p	df	Cramer’s V	Effect Size Interpretation
<b>Academic Performance Affected by:</b>					
Experienced at least 1 Consequence	1.69	.194	1	.00	Negligible
Attention Deficit Disorder	121.47	<.001	1	.03	Negligible
Concern for friend or family member	21.26	<.001	1	.01	Negligible
Death of friend or family member	69.78	<.001	1	.03	Negligible
Depression/Anxiety/SAD	178.47	<.001	1	.04	Negligible
Eating Disorder	1.33	.248	1	.00	Negligible
Internet use/computer games	123.44	<.001	1	.03	Negligible
Learning disability	242.36	<.001	1	.05	Weak
Relationship difficulty	46.20	<.001	1	.02	Negligible
Sleep difficulty	1.09	.296	1	.00	Negligible
Stress	6.58	.010	1	.01	Negligible

Results were calculated for the Mental Health Consequences variables expanded to report the impact of the consequence on grade point average. As shown in Table 40, the results reveal that a greater proportion of 5<sup>th</sup>-year students reported experiencing a lowered GPA as a result of ADD, Concern for friend or family member, Death of a friend or family member, Depression/Anxiety/SAD, Learning disability, and Relationship difficulty, and Stress. For the Sleep Difficulty item, although a larger proportion of 2<sup>nd</sup>-year students report experiencing this consequence overall, 5<sup>th</sup>-year students were more likely to experience a negative impact to their GPA. Second-year students were more likely to have their GPA lowered as a result of Eating Disorders and Internet use/Computer games. With the exception of Eating Disorders, all comparisons resulted in a statistically significant chi-square ( $p < 0.05$ ), though the results of the Cramer’s V test indicate the relationships were generally negligible (Table 41). A weak effect size is indicated on the Learning Disability item.

**Table 40: Mental Health Consequences on Academic Performance Categorized Responses: Fifth-year students and Second-year Students**

	5 <sup>th</sup> -year Students N = 18,588	2 <sup>nd</sup> -year Students N = 88,447
	%	%
<b>Academic Performance Affected by:</b>		
Attention Deficit Disorder		
Yes, but did not affect GPA	5.7	4.3
Yes, did affect GPA	3.9	2.9
Concern for friend or family member		
Yes, but did not affect GPA	17.0	16.3
Yes, did affect GPA	4.9	4.0
Death of friend or family member		
Yes, but did not affect GPA	8.1	7.0
Yes, did affect GPA	3.6	2.6
Depression/Anxiety/SAD		
Yes, but did not affect GPA	13.4	10.4
Yes, did affect GPA	6.8	5.7
Eating Disorder		
Yes, but did not affect GPA	1.0	1.0
Yes, did affect GPA	0.4	0.5
Internet use/computer games		
Yes, but did not affect GPA	10.9	13.7
Yes, did affect GPA	3.2	3.8
Learning disability		
Yes, but did not affect GPA	3.2	1.9
Yes, did affect GPA	2.4	1.4
Relationship difficulty		
Yes, but did not affect GPA	14.4	13.6
Yes, did affect GPA	5.3	4.0
Sleep difficulty		
Yes, but did not affect GPA	21.6	22.5
Yes, did affect GPA	6.2	5.7
Stress		
Yes, but did not affect GPA	27.5	27.8
Yes, did affect GPA	9.9	8.6

**Table 41: Mental Health Consequences on Academic Performance Categorized Responses Comparison: Fifth-year students and Second-year Students**

	X <sup>2</sup>	p	df	Cramer's V	Effect Size Interpretation
<b>Academic Performance Affected by:</b>					
Attention Deficit Disorder	121.48	<.001	2	.03	Negligible
Concern for friend or family member	35.38	<.001	2	.02	Negligible
Death of friend or family member	81.48	<.001	2	.03	Negligible
Depression/Anxiety/SAD	182.04	<.001	2	.04	Negligible
Eating Disorder	2.02	.364	2	.00	Negligible
Internet use/computer games	124.62	<.001	2	.03	Negligible
Learning disability	242.61	<.001	2	.05	Weak
Relationship difficulty	73.85	<.001	2	.03	Negligible
Sleep difficulty	12.19	.002	2	.01	Negligible
Stress	30.13	<.001	2	.02	Negligible

### Fifth-Year Students and Third-Year Students

Among all students, 5<sup>th</sup>-year students demonstrated higher frequency and quantity of consumption of alcohol than 3<sup>rd</sup>-year students on the previous 30 days, number of hours, and number of drinks items (Table 42). Fifth-year students consumed alcohol 3-5 of the past 30 days (M=2.04, SD= 1.56), compared to closer to 1-2 days for 3<sup>rd</sup>-year students (M=1.84, SD=1.52). Fifth-year students consumed 4.92 drinks (SD=4.18) over 3.34 hours (SD=2.41) to the 4.53 (SD=4.01) drinks over 3.02 hours (SD=2.32) consumed by 3<sup>rd</sup>-year students. Previous two-week consumption rates were similar for both groups. Fifth-year students consumed the same amount of alcohol as the last time they “partied” an average of 1.28 days (SD=1.67) in the past 2 weeks, while 3<sup>rd</sup>-year students consumed the same amount on 1.29 days (SD=1.65) in the past 2 weeks. Fifth-year students consumed five or more drinks an average of 1.18 days (SD=1.86) of the past 14, compared to 1.14 days (SD=1.81) for 3<sup>rd</sup>-year students.

Among students who reported consuming alcohol, a greater proportion of 5<sup>th</sup>-year students reported consuming alcohol on all five items than 3<sup>rd</sup>-year students: *Past 30 days use* (77.8% vs. 73.7%); *Hours of alcohol use* (85.3% vs. 80.3%); *Number of drinks consumed* (86.7% vs. 81.5%); *Number of occasions same amount of alcohol consumed in the past 2 weeks* (57.3% vs. 56.1%); and *Number of times in past 2 weeks 5 or more drinks consumed* (43.9% vs. 42.3%) (Table 42). Mean scores indicate that on average, 5<sup>th</sup>-year students drank more often during the past 30 days (M=2.50; SD=1.21), drank more hours (M=3.92; SD=2.13) than 3<sup>rd</sup>-year students (M=3.76; SD=1.99), and consumed more drinks (M=5.67; SD=3.98) than 3<sup>rd</sup>-year students (M=5.55; SD=3.74). Fifth-year students consumed the same amount as the last time they partied an average of 2.23

(SD=1.66) times, as compared to 2.30 (SD=1.6) times for 3<sup>rd</sup>-year students. Fifth-year and 3<sup>rd</sup>-year students consumed five or more drinks in the past 2 weeks an almost identical number of times; M=2.70; SD=1.94, and M=2.69; SD=1.90, respectively. Mean scores for 5<sup>th</sup>-year and 3<sup>rd</sup>-year students on the alcohol use items were statistically different for all items, except *Number of occasions same amount of alcohol consumed in the past 2 weeks* among all students, and *Number of occasions in past 2 weeks 5 or more drinks consumed* among drinkers. In Table 42, positive t-scores indicate greater alcohol use among 5<sup>th</sup>-year students; negative t-scores indicate greater use among 3<sup>rd</sup>-year students.

**Table 42: Alcohol Use Behavior Items: Fifth-year Students and Third-year Students**

			5 <sup>th</sup> -year Students N = 18,588		3 <sup>rd</sup> -year Students N = 85,903		t-test	p	
	Range	%	M	SD	%	M			SD
<b>Alcohol Use Behaviors (all students)</b>									
Days of alcohol use during past 30 days	0-6		2.04	1.56		1.84	1.52	15.20	<.001
Hours of alcohol use last time "partied"	0-14		3.34	2.41		3.02	2.32	16.75	<.001
Number of drinks last time "partied"	0-23		4.92	4.18		4.53	4.01	11.63	<.001
Number of times in past 2 weeks drinking same or more alcohol as last time "partied"	0-10		1.28	1.67		1.29	1.65	-0.78	.438
Number of times in past 2 weeks more than 5 drinks consumed	0-9		1.18	1.86		1.14	1.81	3.07	.002
<b>Alcohol Use Behaviors (drinkers only)</b>									
Days of alcohol use during past 30 days	1-6	77.8	2.62	1.27	73.7	2.50	1.21	9.71	<.001
Hours of alcohol use last time "partied"	1-14	85.3	3.92	2.13	80.3	3.76	1.99	8.75	<.001
Number of drinks last time "partied"	1-23	86.7	5.67	3.98	81.5	5.55	3.74	3.55	<.001
Number of times in past 2 weeks drinking same or more alcohol as last time "partied"	1-10	57.3	2.23	1.66	56.1	2.30	1.60	-3.80	<.001
Number of times in past 2 weeks more than 5 drinks consumed	1-9	43.9	2.70	1.94	42.3	2.69	1.90	0.25	.799

Note: Due to the use of bonferroni's correction,  $p < .005$  is used to determine statistical significance

Positive t-scores indicate greater alcohol use among 5<sup>th</sup>-year students; negative t-scores indicate greater use among 3<sup>rd</sup>-year students

As shown in Table 43, 45% of 5<sup>th</sup>-year students experienced at least one consequence of alcohol use as compared to 43.6% of 3<sup>rd</sup>-year students. A greater

proportion of 5<sup>th</sup>-year students reported experiencing all of the itemized alcohol-related consequences than 3<sup>rd</sup>-year students, except for *Physical injury to self*, reported by a slightly larger proportion of 3<sup>rd</sup>-year students. All comparisons resulted in a statistically significant chi-square ( $p < 0.05$ ) except for *Physical Injury to Self*, and *Forgot where you were or what you did* (Table 44). The results of the Cramer's V test indicate negligible effect sizes for all items.

**Table 43: Alcohol Use Consequence Items: Fifth-year Students and Third-year Students**

	5 <sup>th</sup> -year Students N = 18,588	3 <sup>rd</sup> -year Students N = 85,903
	%	%
<b>Alcohol Consequences</b>		
Experienced at least 1 Consequence	45.1	43.6
Physical injury to self	16.4	16.7
Physical injury to another person	4.6	3.9
Been involved in a fight	7.1	5.9
Did something you later regretted	33.6	31.5
Forgot where you were or what you did	26.2	26.6
Academic performance affected by alcohol use		
Yes, but did not affect GPA	8.8	7.3
Yes, but did affect GPA	2.8	2.1

**Table 44: Alcohol Use Consequence Items Comparison: Fifth-year Students and Third-year Students**

	X <sup>2</sup>	p	df	Cramer's V	Effect Size Interpretation
<b>Alcohol Consequences</b>					
Experienced at least 1 Consequence	13.14	<.001	1	.01	Negligible
Physical injury to self	1.22	.270	1	.00	Negligible
Physical injury to another person	21.19	<.001	1	.01	Negligible
Been involved in a fight	37.67	<.001	1	.02	Negligible
Did something you later regretted	30.59	<.001	1	.02	Negligible
Forgot where you were or what you did	1.56	.212	1	.00	Negligible
Academic performance affected by alcohol use	90.77	<.001	2	.03	Negligible

For the Yes/No response Mental Health Symptom items (Table 45), more 5<sup>th</sup>-year students experienced only mild symptoms (13.7%) and severe symptoms (10.1%) than 3<sup>rd</sup>-year students (12.1%, 9.9%). Larger proportions of 3<sup>rd</sup>-year students experienced at

least moderate (75.5%) symptoms than 5<sup>th</sup>-year students (73.6%). Results varied by individual symptom. Larger proportions of 3<sup>rd</sup>-year students report feeling all symptoms except for exhausted and attempted suicide, in which the groups were equal proportions. Additionally, slightly more 5<sup>th</sup>-year students reported feeling suicidal (10.1%) than 3<sup>rd</sup>-year students (9.8%). Only the overall index score, hopeless, and very sad items resulted in a statistically significant chi-square values ( $p < 0.05$ ) (Table 46). The results of the Cramer's V test indicate negligible effect sizes for all variables.

**Table 45: Mental Health Symptom Items “Yes” Responses: Fifth-year Students and Third-year Students**

	5 <sup>th</sup> -year Students N = 18,588	3 <sup>rd</sup> -year Students N = 85,903
	%	%
<b>Index of Mental Health Symptoms</b>		
No Symptoms	2.6	2.6
Only Mild Symptoms	13.7	12.1
At least Moderate Symptoms	73.6	75.5
At least Severe Symptoms	10.1	9.9
<b>Mental Health Symptoms</b>		
Last year felt overwhelmed by all you had to do	94.6	94.8
Last year felt exhausted (not from physical activity)	92.4	92.4
Last year felt very sad	79.5	81.2
Last year felt things were hopeless	63.0	64.2
Last year felt so depressed it was difficult to function	44.8	44.5
Last year seriously considered attempting suicide	10.1	9.8
Last year attempted suicide	1.2	1.2

**Table 46: Mental Health Symptom Items “Yes” Responses Comparison: Fifth-year Students and Third-year Students**

	X <sup>2</sup>	p	df	Cramer's V	Effect Size Interpretation
<b>Index of Mental Health Symptoms</b>	38.53	<.001	3	.02	Negligible
<b>Mental Health Symptoms</b>					
Last year felt overwhelmed by all you had to do	0.69	.407	1	.00	Negligible
Last year felt exhausted (not from physical activity)	0.02	.903	1	.00	Negligible
Last year felt very sad	29.28	<.001	1	.02	Negligible
Last year felt things were hopeless	10.09	.001	1	.01	Negligible
Last year felt so depressed it was difficult to function	0.54	.464	1	.00	Negligible
Last year seriously considered attempting suicide	1.73	.188	1	.00	Negligible
Last year attempted suicide	0.02	.885	1	.00	Negligible



Across the three-level ordinal frequency responses Mental Health Symptoms items (Table 47), more 5<sup>th</sup>-year students experienced the mild and moderate symptoms 9 or more times in the previous school year than 3<sup>rd</sup>-year students, who were more likely to experience them 1-8 times. More 5<sup>th</sup>-year students reported feeling suicidal 1-8 times than 3<sup>rd</sup>-year students. The proportions of students feeling suicidal 9 or more times, and all attempted suicide responses were the same for both groups. Chi-square values were statistically significant ( $p < 0.05$ ) for the mild and moderate symptoms only (Table 48). The results of the Cramer's V test indicate negligible effect sizes for all variables.

**Table 47: Mental Health Symptom Items Categorized Responses: Fifth-year Students and Third-year Students**

	5 <sup>th</sup> -year Students N = 18,588	3 <sup>rd</sup> -year Students N = 85,903
	%	%
<b>Mental Health Symptoms</b>		
Last year felt overwhelmed by all you had to do		
Never	5.4	5.2
1-8 times	53.0	55.1
9 or more times	41.7	39.7
Last year felt exhausted (not from physical activity)		
Never	7.6	7.6
1-8 times	53.4	55.8
9 or more times	39.0	36.6
Last year felt very sad		
Never	20.5	18.8
1-8 times	59.6	62.4
9 or more times	19.9	18.9
Last year felt things were hopeless		
Never	37.0	35.8
1-8 times	48.7	50.9
9 or more times	14.3	13.3
Last year felt so depressed it was difficult to function		
Never	55.2	55.5
1-8 times	34.1	35.0
9 or more times	10.6	9.5
Last year seriously considered attempting suicide		
Never	89.9	90.2
1-8 times	8.9	8.6
9 or more times	1.2	1.2
Last year attempted suicide		
Never	98.8	98.8
1-8 times	1.1	1.1
9 or more times	0.1	0.1

**Table 48: Mental Health Symptom Items Categorized Responses Comparison: Fifth-year Students and Third-year Students**

	X <sup>2</sup>	p	df	Cramer's V	Effect Size Interpretation
<b>Mental Health Symptoms</b>					
Last year felt overwhelmed by all you had to do	28.35	<.001	2	.02	Negligible
Last year felt exhausted (not from physical activity)	40.31	<.001	2	.02	Negligible
Last year felt very sad	50.56	<.001	2	.02	Negligible
Last year felt things were hopeless	32.08	<.001	2	.02	Negligible
Last year felt so depressed it was difficult to function	23.65	<.001	2	.02	Negligible
Last year seriously considered attempting suicide	1.80	.406	2	.00	Negligible
Last year attempted suicide	1.25	.536	2	.00	Negligible

As shown in Table 49, more 5<sup>th</sup>-year students (18.5%) have been diagnosed with Depression than 3<sup>rd</sup>-year students (14.0%). However, of those diagnosed with Depression, larger proportions of 3<sup>rd</sup>-year students were diagnosed in the last year, are currently in therapy for Depression, and are currently taking medicine for Depression than 5<sup>th</sup>-year students. All comparisons resulted in a statistically significant chi-square ( $p < 0.05$ ) (Table 50). The results of the Cramer's V test indicate weak effect sizes for the ever diagnosed and diagnosed in the last year items, and negligible effect sizes on the therapy and medication items.

**Table 49: Depression Diagnosis, Therapy, and Medication Items: Fifth-year students and Third-year Students**

	5 <sup>th</sup> -year Students N = 18,588 %	3 <sup>rd</sup> -year Students N = 85,903 %
<b>Depression</b>		
Ever diagnosed with depression	18.5	14.0
	N = 3,399 %	N = 11,909 %
<b>Of those diagnosed with Depression:</b>		
Diagnosed with depression in the last year	31.5	37.1
Currently in therapy for depression	21.9	25.5
Currently taking medicine for depression	33.3	36.7

**Table 50: Depression Diagnosis, Therapy, and Medication Items Comparison: Fifth-year students and Third-year Students**

	X <sup>2</sup>	p	df	Cramer's V	Effect Size Interpretation
<b>Mental Health Symptoms</b>					
Ever diagnosed with depression	240.42	<.001	1	.05	Weak
Diagnosed with depression in the last year	67.30	<.001	1	.05	Weak
Currently in therapy for depression	17.92	<.001	1	.04	Negligible
Currently taking medicine for depression	14.22	<.001	1	.03	Negligible

For the Mental Health Experiences items, 5<sup>th</sup>-year students were more likely to experience Anxiety, Chronic Fatigue Syndrome, Depression, Seasonal Affective Disorder, and Substance Abuse than 3<sup>rd</sup>-year students (Table 51). Larger group differences were observed for the Anxiety, Depression, and Substance Abuse items. Third-year students were more likely than 5<sup>th</sup>-year students to experience Anorexia and Bulimia. All comparisons resulted in a statistically significant chi-square value ( $p < 0.05$ ), but only negligible effect sizes (Table 52).

**Table 51: Experiences of Mental Health Disorders in Past Year Items: Fifth-year students and Third-year Students**

	5 <sup>th</sup> -year Students N = 18,588	3 <sup>rd</sup> -year Students N = 85,903
	%	%
<b>Within the past year have you experienced:</b>		
Anorexia	1.3	1.9
Anxiety	15.4	13.1
Bulimia	2.1	2.5
Chronic fatigue	3.9	3.3
Depression	21.4	18.3
Seasonal Affective Disorder	8.2	7.6
Substance abuse	5.3	3.6

**Table 52: Experiences of Mental Health Disorders in Past Year Items Comparison: Fifth-year students and Third-year Students**

	X <sup>2</sup>	p	df	Cramer's V	Effect Size Interpretation
<b>Within the past year have you experienced:</b>					
Anorexia	28.78	<.001	1	.02	Negligible
Anxiety	66.82	<.001	1	.03	Negligible
Bulimia	7.66	.006	1	.01	Negligible
Chronic fatigue	16.69	<.001	1	.01	Negligible
Depression	96.37	<.001	1	.03	Negligible
Seasonal Affective Disorder	7.72	.005	1	.01	Negligible
Substance abuse	114.28	<.001	1	.03	Negligible

Across the Mental Health Diagnosis items, higher proportions of 5<sup>th</sup>-year students had been diagnosed than 3<sup>rd</sup>-year students, with the exception of Anorexia, in which the groups were equal (Table 53). Larger group differences were observed on the Anxiety, Depression, and Substance Abuse items. Approximately 10% of 5<sup>th</sup>-year students report a diagnosis of Anxiety as compared to 8.3% of 3<sup>rd</sup>-year students. Similarly, 17.5% of 5<sup>th</sup>-year students had been diagnosed with Depression, as compared to 13.4% of 3<sup>rd</sup>-year students. Approximately 3% of 5<sup>th</sup>-year students had been diagnosed with Substance Abuse, compared to 1.7% of 3<sup>rd</sup>-year students. Statistically significant chi-square values ( $p < 0.05$ ) were observed for all variables except for Anorexia and Bulimia (Table 54). The results of the Cramer's V test indicate negligible effect sizes for all items.

**Table 53: Lifetime Diagnosis of Mental Health Disorders Items: Fifth-year students and Third-year Students**

	5 <sup>th</sup> -year Students N = 18,588	3 <sup>rd</sup> -year Students N = 85,903
	%	%
<b>Have you ever been diagnosed with:</b>		
Anorexia	2.4	2.4
Anxiety	10.4	8.3
Bulimia	2.3	2.1
Chronic fatigue	1.4	1.2
Depression	17.5	13.4
Seasonal Affective Disorder	2.9	2.2
Substance abuse	2.7	1.7

**Table 54: Lifetime Diagnoses of Mental Health Disorders Items Comparison: Fifth-year students and Third-year Students**

	X <sup>2</sup>	p	df	Cramer's V	Effect Size Interpretation
<b>Have you ever been diagnosed with:</b>					
Anorexia	0.10	.754	1	.00	Negligible
Anxiety	90.47	<.001	1	.03	Negligible
Bulimia	0.92	.338	1	.00	Negligible
Chronic fatigue	9.98	.002	1	.01	Negligible
Depression	202.46	<.001	1	.04	Negligible
Seasonal Affective Disorder	30.52	<.001	1	.02	Negligible
Substance abuse	83.26	<.001	1	.03	Negligible

For the Mental Health Status items, 40.1% of 5<sup>th</sup>-year students report at least one Experience or diagnosis, compared to 35.0% of 3<sup>rd</sup>-year students (Table 55). Fifth-year students were most at-risk (Yes experience/No diagnosis) across all items, with the exception of the Eating Disorder items. The largest group differences were observed for Anxiety, Depression, Seasonal Affective Disorder, and Substance Abuse. Results of the chi-square analysis are presented in Table 56. Statistically significant chi-square values ( $p < 0.05$ ) were observed for all items. The results of the Cramer's V test indicate weak effect size for Depression and negligible effect sizes for all other items.

**Table 55: Status of Mental Health Disorders in Past Year: Fifth-year students and Third-year Students**

	5 <sup>th</sup> -year Students N = 18,588	3 <sup>rd</sup> -year Students N = 85,903
	%	%
<b>Overall Status</b>		
At least 1 Experience or Diagnosis	40.1	35.0
<b>Disorder</b>		
<b>Anorexia</b>		
No Experiences /No Diagnosis	96.9	96.5
No Experiences /Yes Diagnosis	1.8	1.6
Yes Experiences /Yes Diagnosis	0.5	0.8
Yes Experiences /No Diagnosis	0.8	1.1
<b>Anxiety</b>		
No Experiences /No Diagnosis	82.3	85.4
No Experiences /Yes Diagnosis	2.2	1.4
Yes Experiences /Yes Diagnosis	8.2	6.8
Yes Experiences /No Diagnosis	7.2	6.3

**Table 55 (continued)**

Bulimia		
No Experiences /No Diagnosis	96.4	96.4
No Experiences /Yes Diagnosis	1.4	1.1
Yes Experiences /Yes Diagnosis	0.9	1.0
Yes Experiences /No Diagnosis	1.3	1.5
Chronic fatigue		
No Experiences /No Diagnosis	95.6	96.3
No Experiences /Yes Diagnosis	0.4	0.3
Yes Experiences /Yes Diagnosis	1.0	0.8
Yes Experiences /No Diagnosis	2.9	2.5
Depression		
No Experiences /No Diagnosis	72.5	77.6
No Experiences /Yes Diagnosis	5.9	4.1
Yes Experiences /Yes Diagnosis	11.6	9.4
Yes Experiences /No Diagnosis	9.9	9.0
Seasonal Affective Disorder		
No Experiences /No Diagnosis	91.1	92.0
No Experiences /Yes Diagnosis	0.6	0.3
Yes Experiences /Yes Diagnosis	2.3	1.9
Yes Experiences /No Diagnosis	6.0	5.8
Substance abuse		
No Experiences /No Diagnosis	93.1	95.5
No Experiences /Yes Diagnosis	1.5	0.9
Yes Experiences /Yes Diagnosis	1.2	0.8
Yes Experiences /No Diagnosis	4.1	2.8

**Table 56: Status of Mental Health Disorders in Past Year Comparison: Fifth-year students and Third-year Students**

	X <sup>2</sup>	p	df	Cramer's V	Effect Size Interpretation
<b>Overall Status</b>	158.42	<.001	1	.04	Negligible
<b>Disorder:</b>					
Anorexia	32.68	<.001	3	.02	Negligible
Anxiety	139.33	<.001	3	.04	Negligible
Bulimia	19.32	<.001	3	.01	Negligible
Chronic fatigue	20.73	<.001	3	.01	Negligible
Depression	252.99	<.001	3	.05	Weak
Seasonal Affective Disorder	38.22	<.001	3	.02	Negligible
Substance abuse	173.52	<.001	3	.04	Negligible

As shown in Table 57, 58.5% of 5<sup>th</sup>-year students experienced at least one mental health related consequence as compared to 57.5% of 3<sup>rd</sup>-year students. A greater proportion of 5<sup>th</sup>-year students reported experiencing all of the itemized mental health-related consequences than 3<sup>rd</sup>-year students, with the exception of Eating Disorders and Internet use/Computer games. The largest group differences were observed for ADD, Depression, and Learning Disability. Except for Eating Disorders, all comparisons

resulted in a statistically significant chi-square ( $p < 0.05$ ), though the results of the Cramer's V test indicate the relationships are negligible (Table 58).

**Table 57: Mental Health Consequences on Academic Performance Items “Yes” Responses: Fifth-year students and Third-year Students**

	5 <sup>th</sup> -year Students N = 18,588	3 <sup>rd</sup> -year Students N = 85,903
	%	%
<b>Academic Performance Affected by:</b>		
Experienced at least 1 Consequence	58.5	57.5
Attention Deficit Disorder	9.6	7.4
Concern for friend or family member	21.9	20.8
Death of friend or family member	11.7	10.1
Depression/Anxiety/SAD	20.2	17.0
Eating Disorder	1.4	1.5
Internet use/Computer games	14.2	15.5
Learning disability	5.7	3.5
Relationship difficulty	19.7	18.4
Sleep difficulty	27.8	26.8
Stress	37.4	36.3

**Table 58: Mental Health Consequences on Academic Performance Items “Yes” Responses Comparison: Fifth-year students and Third-year Students**

	X <sup>2</sup>	p	df	Cramer's V	Effect Size Interpretation
<b>Academic Performance Affected by:</b>					
Experienced at least 1 Consequence	6.50	.011	1	.01	Negligible
Attention Deficit Disorder	95.72	<.001	1	.03	Negligible
Concern for friend or family member	10.09	.001	1	.01	Negligible
Death of friend or family member	37.37	<.001	1	.02	Negligible
Depression/Anxiety/SAD	104.91	<.001	1	.03	Negligible
Eating Disorder	0.48	.489	1	.00	Negligible
Internet use/Computer games	19.72	<.001	1	.01	Negligible
Learning disability	183.88	<.001	1	.04	Negligible
Relationship difficulty	17.22	<.001	1	.01	Negligible
Sleep difficulty	7.19	.007	1	.01	Negligible
Stress	7.42	.006	1	.01	Negligible

Results also were calculated for the Mental Health Consequences variables expanded to report the impact of the consequence on grade point average (Table 59). More 5<sup>th</sup>-year students reported experiencing a lowered GPA as a result of all of the itemized consequences than 3<sup>rd</sup>-year students, with the exception of Eating disorders. Third-year students were more likely to experience consequences of Internet

use/Computer games, however the proportions of those who experienced a lowered GPA were the same for both groups. With the exception of Eating Disorders, all comparisons resulted in a statistically significant chi-square ( $p < 0.05$ ), though the results of the Cramer's V test indicate only negligible effect sizes (Table 60).

**Table 59: Mental Health Consequences on Academic Performance Items Categorized “Yes” Responses: Fifth-year students and Third-year Students**

	5 <sup>th</sup> -year Students N = 18,588	3 <sup>rd</sup> -year Students N = 85,903
	%	%
<b>Academic Performance Affected by:</b>		
Attention Deficit Disorder		
Yes, but did not affect GPA	5.7	4.3
Yes, did affect GPA	3.9	3.1
Concern for friend or family member		
Yes, but did not affect GPA	17.0	16.6
Yes, did affect GPA	4.9	4.2
Death of friend or family member		
Yes, but did not affect GPA	8.1	7.3
Yes, did affect GPA	3.6	2.8
Depression/Anxiety/SAD		
Yes, but did not affect GPA	13.4	11.0
Yes, did affect GPA	6.8	6.0
Eating Disorder		
Yes, but did not affect GPA	1.0	1.0
Yes, did affect GPA	0.4	0.5
Internet use/Computer games		
Yes, but did not affect GPA	10.9	12.2
Yes, did affect GPA	3.2	3.2
Learning disability		
Yes, but did not affect GPA	3.2	2.1
Yes, did affect GPA	2.4	1.4
Relationship difficulty		
Yes, but did not affect GPA	14.4	14.0
Yes, did affect GPA	5.3	4.4
Sleep difficulty		
Yes, but did not affect GPA	21.6	21.5
Yes, did affect GPA	6.2	5.3
Stress		
Yes, but did not affect GPA	27.5	27.7
Yes, did affect GPA	9.9	8.6



**Table 60: Mental Health Consequences on Academic Performance Items Categorized “Yes” Responses Comparison: Fifth-year students and Third-year Students**

	X <sup>2</sup>	p	df	Cramer’s V	Effect Size Interpretation
<b>Academic Performance Affected by:</b>					
Attention Deficit Disorder	96.83	<.001	2	.03	Negligible
Concern for friend or family member	19.34	<.001	2	.01	Negligible
Death of friend or family member	44.85	<.001	2	.02	Negligible
Depression/Anxiety/SAD	107.41	<.001	2	.03	Negligible
Eating Disorder	0.99	.608	2	.00	Negligible
Internet use/Computer games	24.69	<.001	2	.02	Negligible
Learning disability	189.26	<.001	2	.04	Negligible
Relationship difficulty	32.49	<.001	2	.02	Negligible
Sleep difficulty	24.75	<.001	2	.02	Negligible
Stress	30.59	<.001	2	.02	Negligible

### Fifth-Year Students and Fourth-Year Students

Alcohol Use items are presented for all students as well as just drinkers (students who answered at least “1” to each item). Among all students, 5<sup>th</sup>-year students drank 4.92 drinks (SD=4.18) over 3.34 hours (SD=2.41) compared to the 4.65 (SD=3.88) drinks over 3.22 hours (SD=2.25) consumed by 4<sup>th</sup>-year students (Table 61). While the mean score for the 30-day use item was slightly higher for 4<sup>th</sup>-year students (M=2.11) than 5<sup>th</sup>-year students (M=2.04), both translate to students drinking on 3-5 of the previous 30 days. Past 2 week consumption was lower for 5<sup>th</sup>-year students than 4<sup>th</sup>-year students. Fifth-year students consumed the same amount of alcohol as the last time they “partied” an average of 1.28 days (SD=1.67) in the past 2 weeks, while 4<sup>th</sup>-year students consumed the same amount on 1.44 days (SD=1.71) in the past 2 weeks. Fifth-year students consumed five or more drinks an average of 1.18 days (SD=1.86) of the past 14, compared to 1.22 days (SD=1.87) for 4<sup>th</sup>-year students.

Among students who reported consuming alcohol, unlike the previous group comparisons, a smaller proportion of 5<sup>th</sup>-year students reported consuming alcohol on all five items than 4<sup>th</sup>-year students: *Past 30 days use* (77.8% vs. 80.6%); *Hours of alcohol*

use (85.3% vs. 85.7%); *Number of drinks consumed* (86.7% vs. 86.9%); *Number of occasions same amount of alcohol consumed in the past 2 weeks* (57.3% vs. 61.9%); and *Number of times in past 2 weeks 5 or more drinks consumed* (43.9% vs. 44.9%). Trends of use followed similar patterns as all students. Fifth-year students consumed more drinks ( $M=5.67$ ;  $SD=3.98$ ) over more hours ( $M=3.92$ ;  $SD=2.13$ ) than 4<sup>th</sup>-year students ( $M= 5.35$ ;  $SD=3.68$ ,  $M=3.76$ ;  $SD=1.97$ ). Fifth-year students consumed the same amount as the last time they partied an average of 2.23 ( $SD=1.66$ ) times, as compared to 2.33 ( $SD=1.63$ ) times for 4<sup>th</sup>-year students. Fifth-year and 4<sup>th</sup>-year students consumed five or more drinks in the past 2 weeks an almost identical number of times;  $M=2.70$ ;  $SD=1.94$ , and  $M=2.72$ ;  $SD=1.93$ , respectively. Past 30 day alcohol use was the same for both groups ( $M=2.62$ ), between 3-5 and 6-9 days. Mean scores for 5<sup>th</sup>-year and 4<sup>th</sup>-year students on the alcohol use items were significantly different ( $p<.005$ ) for all items, except *Past 30 day use* and *Number of occasions in past 2 weeks 5 or more drinks consumed*, among drinkers. In Table 61, positive t-scores indicate greater alcohol use among 5<sup>th</sup>-year students; negative t-scores indicate greater use among 4<sup>th</sup>-year students.

As shown in Table 62, 45.1% of 5<sup>th</sup>-year students experienced at least one consequence of alcohol use as compared to 45.5% of 4<sup>th</sup>-year students. A greater proportion of 5<sup>th</sup>-year students reported experiencing all of the itemized alcohol-related consequences than 4<sup>th</sup>-year students, except for *Physical Injury to self* and *Forgot where you were or what you did*. All comparisons resulted in a statistically significant chi-square ( $p<0.05$ ), except for the overall consequence index, and *Did something you later regretted* item (Table 63). The results of the Cramer's V test indicate negligible effect sizes for all items.

**Table 61: Alcohol Use Behavior Items: Fifth-year Students and Fourth-year Students**

	Range	5 <sup>th</sup> -year Students N = 18,588		4 <sup>th</sup> -year Students N = 68,617		t-test	p		
		%	M	SD	%			M	SD
<b>Alcohol Use Behaviors (all students)</b>									
Days of alcohol use during past 30 days	0-6		2.04	1.56	2.11	1.51	-5.84	<.001	
Hours of alcohol use last time "partied"	0-14		3.34	2.41	3.22	2.25	5.96	<.001	
Number of drinks last time "partied"	0-23		4.92	4.18	4.65	3.88	7.87	<.001	
Number of times in past 2 weeks drinking same or more alcohol as last time "partied"	0-10		1.28	1.67	1.44	1.71	-11.74	<.001	
Number of times in past 2 weeks more than 5 drinks consumed	0-9		1.18	1.86	1.22	1.87	-2.31	.021	
<b>Alcohol Use Behaviors (drinkers only)</b>									
Days of alcohol use during past 30 days	1-6	77.8	2.62	1.27	80.6	2.62	1.22	-0.13	.893
Hours of alcohol use last time "partied"	1-14	85.3	3.92	2.13	85.7	3.76	1.97	8.41	<.001
Number of drinks last time "partied"	1-23	86.7	5.67	3.98	86.9	5.35	3.68	9.28	<.001
Number of times in past 2 weeks drinking same or more alcohol as last time "partied"	1-10	57.3	2.23	1.66	61.9	2.33	1.63	-5.57	<.001
Number of times in past 2 weeks more than 5 drinks consumed	1-9	43.9	2.70	1.94	44.9	2.72	1.93	-0.99	.324

Note: Due to the use of bonferroni's correction,  $p < .005$  is used to determine statistical significance  
Positive t-scores indicate greater alcohol use among 5<sup>th</sup>-year students; negative t-scores indicate greater use among 4<sup>th</sup>-year students

**Table 62: Alcohol Use Consequence Items "Yes" Responses: Fifth-year Students and Fourth-year Students**

	5 <sup>th</sup> -year Students N = 18,588	4 <sup>th</sup> -year Students N = 68,617
	%	%
<b>Alcohol Consequences</b>		
Experienced at least 1 Consequence	45.1	45.5
Physical injury to self	16.4	17.3
Physical injury to another person	4.6	3.8
Been involved in a fight	7.1	6.0
Did something you later regretted	33.6	33.1
Forgot where you were or what you did	26.2	27.8
Academic performance affected by alcohol use		
Yes, but did not affect GPA	8.8	7.1
Yes, but did affect GPA	2.8	2.0

**Table 63: Alcohol Use Consequence Items "Yes" Responses Comparison: Fifth-year Students and Fourth-year Students**

	X <sup>2</sup>	p	df	Cramer's V	Effect Size Interpretation
<b>Alcohol Consequences</b>					
Experienced at least 1 Consequence	1.01	.316	1	.00	Negligible
Physical injury to self	8.22	.004	1	.01	Negligible
Physical injury to another person	21.38	<.001	1	.02	Negligible
Been involved in a fight	32.83	<.001	1	.02	Negligible
Did something you later regretted	1.23	.267	1	.00	Negligible
Forgot where you were or what you did	18.19	<.001	1	.01	Negligible
Academic performance affected by alcohol use	104.28	<.001	2	.04	Negligible

Across the Yes/No response Mental Health Symptom items (Table 64), 13.7% of 5<sup>th</sup>-year students reported only mild symptoms and 10.1% experienced severe symptoms compared to 13.1% and 9.0% of 4<sup>th</sup>-year students, respectively. Slightly more 4<sup>th</sup>-year students reported feeling overwhelmed, exhausted, and very sad. More 5<sup>th</sup>-year students reported feeling hopeless, depressed, suicidal, and attempted suicide. Chi-square values were significant ( $p < 0.05$ ) for the overall index, felt very sad, depressed, and suicidal items (Table 65). The Cramer's V tests indicate negligible effect sizes for all variables.

**Table 64: Mental Health Symptom Items “Yes” Responses: Fifth-year Students and Fourth-year Students**

	5 <sup>th</sup> -year Students N = 18,588	4 <sup>th</sup> -year Students N = 68,617
	%	%
<b>Index of Mental Health Symptoms</b>		
No Symptoms	2.6	2.6
Only Mild Symptoms	13.7	13.1
At least Moderate Symptoms	73.6	75.3
At least Severe Symptoms	10.1	9.0
<b>Mental Health Symptoms</b>		
Last year felt overwhelmed by all you had to do	94.6	94.7
Last year felt exhausted (not from physical activity)	92.4	92.6
Last year felt very sad	79.5	80.5
Last year felt things were hopeless	63.0	62.2
Last year felt so depressed it was difficult to function	44.8	43.7
Last year seriously considered attempting suicide	10.1	8.9
Last year attempted suicide	1.2	1.1

**Table 65: Mental Health Symptom Items “Yes” Responses Comparison: Fifth-year Students and Fourth-year Students**

	X <sup>2</sup>	p	df	Cramer's V	Effect Size Interpretation
<b>Index of Mental Health Symptoms</b>	30.11	<.001	3	.02	Negligible
<b>Mental Health Symptoms</b>					
Last year felt overwhelmed by all you had to do	0.08	.783	1	.00	Negligible
Last year felt exhausted (not from physical activity)	0.51	.475	1	.00	Negligible
Last year felt very sad	8.60	.003	1	.01	Negligible
Last year felt things were hopeless	3.36	.067	1	.01	Negligible
Last year felt so depressed it was difficult to function	7.55	.006	1	.01	Negligible
Last year seriously considered attempting suicide	24.21	<.001	1	.02	Negligible
Last year attempted suicide	3.17	.075	1	.01	Negligible

Table 66 reports the results of the Mental Health Symptoms variables coded as three-level ordinal frequency responses. Fifth-year students were more likely than 4<sup>th</sup>-year students to experience all seven symptoms 9 times or more, except for attempted suicide, in which the groups were the same. Larger group differences were observed for feeling exhausted, very sad, hopeless, and depressed. Results of the chi-square analysis are presented in Table 67. All comparisons resulted in a statistically significant chi-square ( $p < 0.05$ ), except for felt exhausted and attempted suicide. The results of the Cramer's V test indicate negligible effect sizes for all variables.

**Table 66: Mental Health Symptom Items Categorical Responses: Fifth-year Students and Fourth-year Students**

	5 <sup>th</sup> -year Students N = 18,588	4 <sup>th</sup> -year Students N = 68,617
	%	%
<b>Mental Health Symptoms</b>		
Last year felt overwhelmed by all you had to do		
Never	5.4	5.3
1-8 times	53.0	53.7
9 or more times	41.7	41.0
Last year felt exhausted (not from physical activity)		
Never	7.6	7.4
1-8 times	53.4	54.6
9 or more times	39.0	37.9
Last year felt very sad		
Never	20.5	19.5
1-8 times	59.6	61.9
9 or more times	19.9	18.6
Last year felt things were hopeless		
Never	37.0	37.8
1-8 times	48.7	49.6
9 or more times	14.3	12.6
Last year felt so depressed it was difficult to function		
Never	55.2	56.3
1-8 times	34.1	34.6
9 or more times	10.6	9.1
Last year seriously considered attempting suicide		
Never	89.9	91.1
1-8 times	8.9	7.9
9 or more times	1.2	1.1
Last year attempted suicide		
Never	98.8	98.9
1-8 times	1.1	1.0
9 or more times	0.1	0.1

**Table 67: Mental Health Symptom Items Categorical Responses Comparison: Fifth-year Students and Fourth-year Students**

	X <sup>2</sup>	p	df	Cramer's V	Effect Size Interpretation
<b>Mental Health Symptoms</b>					
Last year felt overwhelmed by all you had to do	3.18	.204	2	.01	Negligible
Last year felt exhausted (not from physical activity)	9.08	.011	2	.01	Negligible
Last year felt very sad	32.64	<.001	2	.02	Negligible
Last year felt things were hopeless	35.06	<.001	2	.02	Negligible
Last year felt so depressed it was difficult to function	43.71	<.001	2	.02	Negligible
Last year seriously considered attempting suicide	24.25	<.001	2	.02	Negligible
Last year attempted suicide	5.21	.074	2	.01	Negligible

For the Depression variables, more 5<sup>th</sup>-year students (18.5%) have been diagnosed with Depression than 4<sup>th</sup>-year students (15.1%) (Table 68). However, of those diagnosed with Depression, larger proportions of 4<sup>th</sup>-year students were diagnosed in the last year (33.4%), are currently in therapy for Depression (24.5%), and are currently taking medicine for Depression (34.7) than 5<sup>th</sup>-year students. Chi-square values were statistically significant ( $p < 0.05$ ) for all variables, except for currently taking medication (Table 69). The results of the Cramer's V test indicate negligible effect sizes on all four item comparisons.

**Table 68: Depression Diagnosis, Therapy, and Medication Items: Fifth-year students and Fourth-year Students**

	5 <sup>th</sup> -year Students N = 18,588	4 <sup>th</sup> -year Students N = 68,617
	%	%
<b>Depression</b>		
Ever diagnosed with depression	18.5	15.1
	N = 3,399	N = 10,229
	%	%
<b>Of those diagnosed with depression</b>		
Diagnosed with depression in the last year	31.5	33.4
Currently in therapy for depression	21.9	24.5
Currently taking medicine for depression	33.3	34.7

**Table 69: Depression Diagnosis, Therapy, and Medication Items Comparison: Fifth-year students and Fourth-year Students**

	X <sup>2</sup>	p	df	Cramer's V	Effect Size Interpretation
<b>Depression</b>					
Ever diagnosed with depression	126.21	<.001	1	.04	Negligible
Diagnosed with depression in the last year	4.21	.040	1	.02	Negligible
Currently in therapy for depression	9.56	.002	1	.03	Negligible
Currently taking medicine for depression	2.06	.152	1	.01	Negligible

Among the Mental Health Experience items, a higher proportion of 5<sup>th</sup>-year students experienced Anxiety (15.4%), Chronic Fatigue Syndrome (3.9%), Depression (21.4%), and Substance Abuse (5.3%) than 4<sup>th</sup>-year students (13.3%, 3.2%, 18.0%, and 3.8%) (Table 70). Slightly more 4<sup>th</sup>-year students experienced Anorexia (1.6%), Bulimia (2.3%), and Seasonal Affective Disorder (8.3%) than 5<sup>th</sup>-year students (1.3%, 2.1%, and 8.2%). All comparisons resulted in a statistically significant chi-square ( $p < 0.05$ ), with the exception of Bulimia and Seasonal Affective Disorder. The results of the Cramer's V test indicate negligible effect sizes for all items (Table 71).

**Table 70: Experiences of Mental Health Disorders in Past Year Items: Fifth-year students and Fourth-year Students**

	5 <sup>th</sup> -year Students N = 18,588	4 <sup>th</sup> -year Students N = 68,617
	%	%
<b>Within the past year have you experienced:</b>		
Anorexia	1.3	1.6
Anxiety	15.4	13.3
Bulimia	2.1	2.3
Chronic fatigue	3.9	3.2
Depression	21.4	18.0
Seasonal Affective Disorder	8.2	8.3
Substance abuse	5.3	3.8

**Table 71: Experiences of Mental Health Disorders in Past Year Items Comparison: Fifth-year students and Fourth-year Students**

	X <sup>2</sup>	p	df	Cramer's V	Effect Size Interpretation
<b>Within the past year have you experienced:</b>					
Anorexia	7.58	.006	1	.01	Negligible
Anxiety	50.90	<.001	1	.02	Negligible
Bulimia	.93	.334	1	.00	Negligible
Chronic fatigue	24.20	<.001	1	.02	Negligible
Depression	110.20	<.001	1	.04	Negligible
Seasonal Affective Disorder	.16	.690	1	.00	Negligible
Substance abuse	86.91	<.001	1	.03	Negligible

Across all seven Mental Health Diagnosis items, more 5<sup>th</sup>-year students had been diagnosed than 4<sup>th</sup>-year students, except for Anorexia (Table 72). Larger group differences were observed on the Anxiety, Depression, and Substance Abuse items. Approximately 10% of 5<sup>th</sup>-year students report a diagnosis of Anxiety as compared to 8.9% of 4<sup>th</sup>-year students. Similarly, 17.5% of 5<sup>th</sup>-year students had been diagnosed with Depression, as compared to 14.4% of 4<sup>th</sup>-year students. Statistically significant chi-square values ( $p < 0.05$ ) were observed for all variables except for Anorexia and Bulimia (Table 73). The results of the Cramer's V test indicate negligible effect sizes for all items.

**Table 72: Lifetime Diagnoses of Mental Health Disorders Items: Fifth-year students and Fourth-year Students**

	5 <sup>th</sup> -year Students N = 18,588	4 <sup>th</sup> -year Students N = 68,617
	%	%
<b>Have you ever been diagnosed with:</b>		
Anorexia	2.4	2.6
Anxiety	10.4	8.9
Bulimia	2.3	2.2
Chronic fatigue	1.4	1.2
Depression	17.5	14.4
Seasonal Affective Disorder	2.9	2.5
Substance abuse	2.7	1.6



**Table 73: Lifetime Diagnoses of Mental Health Disorders Items Comparison: Fifth-year students and Fourth-year Students**

	X <sup>2</sup>	p	df	Cramer's V	Effect Size Interpretation
<b>Have you ever been diagnosed with:</b>					
Anorexia	2.62	.105	1	.01	Negligible
Anxiety	39.08	<.001	1	.02	Negligible
Bulimia	0.00	.990	1	.00	Negligible
Chronic fatigue	6.48	.011	1	.01	Negligible
Depression	102.95	<.001	1	.04	Negligible
Seasonal Affective Disorder	12.04	.001	1	.01	Negligible
Substance abuse	99.48	<.001	1	.03	Negligible

Table 74 reports the results for Mental Health Status. Forty percent of 5<sup>th</sup>-year students report at least one Experience or diagnosis, compared to 35.8% of 4<sup>th</sup>-year students. A higher proportion of 5<sup>th</sup>-year students reported being most at-risk (Yes experience/No diagnosis) across all items, with the exception of the Eating Disorder items and Seasonal Affective Disorder. The largest group differences were observed for Anxiety, Depression, and Substance Abuse. There were virtually no differences between 5<sup>th</sup>-year and 4<sup>th</sup>-year students in regards to Bulimia. Statistically significant chi-square values ( $p < 0.05$ ) were observed for all items except Anorexia and Bulimia. The results of the Cramer's V test indicate a weak effect size for Depression (Table 75). Negligible effect sizes were observed all other variables.

**Table 74: Status of Mental Health Disorders: Fifth-year students and Fourth-year Students**

	5 <sup>th</sup> -year Students N = 18,588	4 <sup>th</sup> -year Students N = 68,617
	%	%
<b>Overall Status</b>		
At least 1 Experience or Diagnosis	40.1	35.8
<b>Disorder</b>		
Anorexia		
No Experiences /No Diagnosis	96.9	96.6
No Experiences /Yes Diagnosis	1.8	1.8
Yes Experiences /Yes Diagnosis	0.5	0.7
Yes Experiences /No Diagnosis	0.8	0.9

**Table 74 (continued)**

Anxiety		
No Experiences /No Diagnosis	82.3	85.0
No Experiences /Yes Diagnosis	2.2	1.7
Yes Experiences /Yes Diagnosis	8.2	7.2
Yes Experiences /No Diagnosis	7.2	6.1
Bulimia		
No Experiences /No Diagnosis	96.4	96.4
No Experiences /Yes Diagnosis	1.4	1.3
Yes Experiences /Yes Diagnosis	0.9	0.9
Yes Experiences /No Diagnosis	1.3	1.3
Chronic fatigue		
No Experiences /No Diagnosis	95.6	96.4
No Experiences /Yes Diagnosis	0.4	0.4
Yes Experiences /Yes Diagnosis	1.0	0.8
Yes Experiences /No Diagnosis	2.9	2.4
Depression		
No Experiences /No Diagnosis	72.5	77.2
No Experiences /Yes Diagnosis	5.9	4.7
Yes Experiences /Yes Diagnosis	11.6	9.7
Yes Experiences /No Diagnosis	9.9	8.3
Seasonal Affective Disorder		
No Experiences /No Diagnosis	91.1	91.2
No Experiences /Yes Diagnosis	0.6	0.4
Yes Experiences /Yes Diagnosis	2.3	2.1
Yes Experiences /No Diagnosis	6.0	6.3
Substance abuse		
No Experiences /No Diagnosis	93.1	95.4
No Experiences /Yes Diagnosis	1.5	0.9
Yes Experiences /Yes Diagnosis	1.2	0.8
Yes Experiences /No Diagnosis	4.1	3.0

**Table 75: Status of Mental Health Disorders Comparison: Fifth-year students and Fourth-year Students**

	X <sup>2</sup>	p	df	Cramer's V	Effect Size Interpretation
<b>Overall Status</b>	107.70	<.001	1	.04	Negligible
<b>Disorder:</b>					
Anorexia	10.21	.017	3	.01	Negligible
Anxiety	84.27	<.001	3	.03	Negligible
Bulimia	2.46	.482	3	.01	Negligible
Chronic fatigue	25.75	<.001	3	.02	Negligible
Depression	169.91	<.001	3	.05	Weak
Seasonal Affective Disorder	17.74	<.001	3	.02	Negligible
Substance abuse	151.59	<.001	3	.04	Negligible

As shown in Table 76, 58.5% of 5<sup>th</sup>-year students experienced at least one mental health related consequence as compared to 54.4% of 4<sup>th</sup>-year students. Fifth-year students were more likely to report experiencing all of the itemized alcohol-related consequences than 4<sup>th</sup>-year students, with the exception of Eating Disorders. With the

exception of Eating Disorders, all comparisons resulted in a statistically significant chi-square ( $p < 0.05$ ) (Table 77). A weak effect size was observed for Learning Disability. A negligible effect size is indicated on all other consequence items.

**Table 76: Mental Health Consequences on Academic Performance Items “Yes” Responses: Fifth-year students and Fourth-year Students**

	5 <sup>th</sup> -year Students N = 18,588	4 <sup>th</sup> -year Students N = 68,617
	%	%
<b>Academic Performance Affected by:</b>		
Experienced at least 1 Consequence	58.5	54.4
Attention Deficit Disorder	9.6	6.8
Concern for friend or family member	21.9	19.9
Death of friend or family member	11.7	10.0
Depression/Anxiety/SAD	20.2	16.7
Eating Disorder	1.4	1.4
Internet use/Computer games	14.2	13.4
Learning disability	5.7	3.4
Relationship difficulty	19.7	17.4
Sleep difficulty	27.8	24.3
Stress	37.4	33.9

**Table 77: Mental Health Consequences on Academic Performance Items “Yes” Responses Comparison: Fifth-year students and Fourth-year Students**

	X <sup>2</sup>	p	df	Cramer’s V	Effect Size Interpretation
<b>Academic Performance Affected by:</b>					
Experienced at least 1 Consequence	99.34	<.001	1	.03	Negligible
Attention Deficit Disorder	154.80	<.001	1	.04	Negligible
Concern for friend or family member	35.68	<.001	1	.02	Negligible
Death of friend or family member	43.93	<.001	1	.02	Negligible
Depression/Anxiety/SAD	119.23	<.001	1	.04	Negligible
Eating Disorder	0.09	.763	1	.00	Negligible
Internet use/Computer games	6.91	.009	1	.01	Negligible
Learning disability	190.11	<.001	1	.05	Weak
Relationship difficulty	49.78	<.001	1	.02	Negligible
Sleep difficulty	91.14	<.001	1	.03	Negligible
Stress	80.44	<.001	1	.03	Negligible

Results for the categorical Mental Health Consequences variables mirror those of the previous table with greater proportion of 5<sup>th</sup>-year students reported experiencing a lowered GPA as a result of all of the itemized consequences than 4<sup>th</sup>-year students, with

the exception of Eating Disorders (Table 78). Similarly, all comparisons except for Eating Disorders resulted in a statistically significant chi-square ( $p < 0.05$ ), though the results of the Cramer's V test indicate the relationships were generally negligible (Table 79). Only Learning Disability demonstrated a weak effect size.

**Table 78: Mental Health Consequences on Academic Performance Items Categorical “Yes” Responses: Fifth-year students and Fourth-year Students**

	5 <sup>th</sup> -year Students N = 18,588	4 <sup>th</sup> -year Students N = 68,617
	%	%
<b>Academic Performance Affected by:</b>		
Attention Deficit Disorder		
Yes, but did not affect GPA	5.7	4.0
Yes, did affect GPA	3.9	2.8
Concern for friend or family member		
Yes, but did not affect GPA	17.0	15.8
Yes, did affect GPA	4.9	4.1
Death of friend or family member		
Yes, but did not affect GPA	8.1	7.1
Yes, did affect GPA	3.6	2.9
Depression/Anxiety/SAD		
Yes, but did not affect GPA	13.4	11.0
Yes, did affect GPA	6.8	5.8
Eating Disorder		
Yes, but did not affect GPA	1.0	1.0
Yes, did affect GPA	0.4	0.4
Internet use/Computer games		
Yes, but did not affect GPA	10.9	10.6
Yes, did affect GPA	3.2	2.8
Learning disability		
Yes, but did not affect GPA	3.2	2.0
Yes, did affect GPA	2.4	1.4
Relationship difficulty		
Yes, but did not affect GPA	14.4	13.3
Yes, did affect GPA	5.3	4.1
Sleep difficulty		
Yes, but did not affect GPA	21.6	19.7
Yes, did affect GPA	6.2	4.6
Stress		
Yes, but did not affect GPA	27.5	25.9
Yes, did affect GPA	9.9	8.0

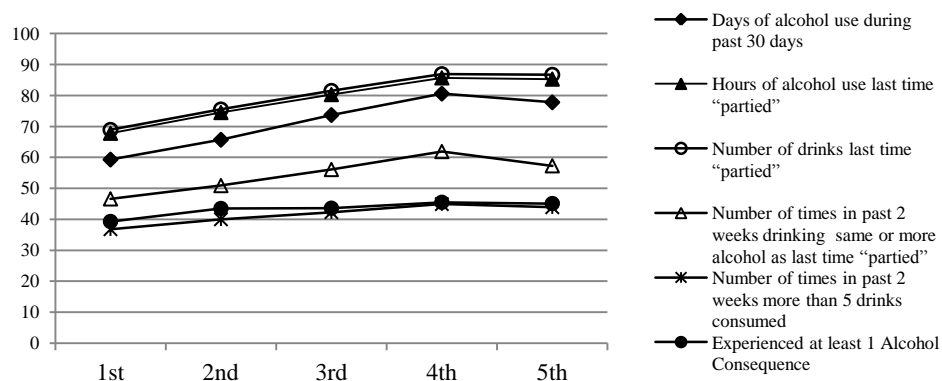
**Table 79: Mental Health Consequences on Academic Performance Items Categorical “Yes” Responses Comparison: Fifth-year students and Fourth-year Students**

	X <sup>2</sup>	p	df	Cramer’s V	Effect Size Interpretation
<b>Academic Performance Affected by:</b>					
Attention Deficit Disorder	155.26	<.001	2	.04	Negligible
Concern for friend or family member	42.07	<.001	2	.02	Negligible
Death of friend or family member	46.05	<.001	2	.02	Negligible
Depression/Anxiety/SAD	120.05	<.001	2	.04	Negligible
Eating Disorder	0.11	.945	2	.00	Negligible
Internet use/Computer games	13.38	.001	2	.01	Negligible
Learning disability	192.33	<.001	2	.05	Weak
Relationship difficulty	64.27	<.001	2	.03	Negligible
Sleep difficulty	120.61	<.001	2	.04	Negligible
Stress	106.40	<.001	2	.04	Negligible

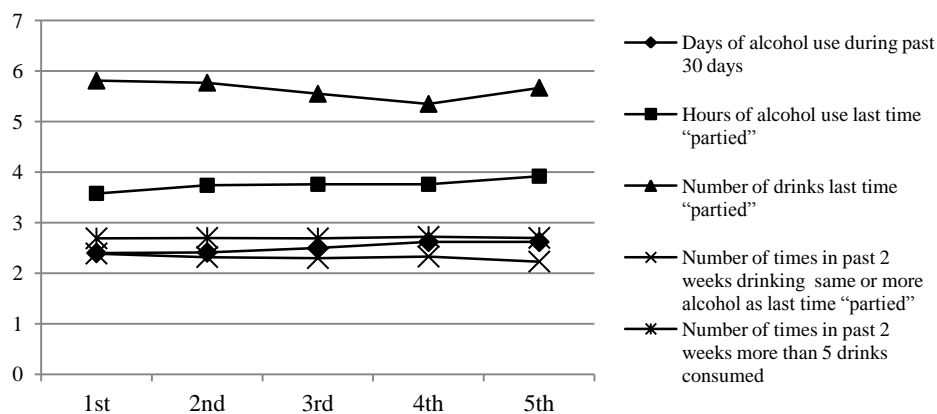
### Summary

The first hypothesis of this study was: 5<sup>th</sup>-year students are more likely to consume greater amounts of alcohol and to experience more mental health issues than other classes of students. The alcohol use analyses provide evidence to support the hypothesis. Figure 3 graphs the proportion of students, by year in school, who use alcohol, across the five alcohol use variables and the alcohol consequence index variable. The proportion of 5<sup>th</sup>-year students who consume alcohol is greater than 1<sup>st</sup>-, 2<sup>nd</sup>-, and 3<sup>rd</sup>-year students across all variables. Fifth-year students appear most like 4<sup>th</sup>-year students in regards to the proportion of alcohol users. The proportion of those experiencing alcohol-related consequences also increases with year-in-school.

Looking across the actual quantity and frequency of alcohol use variables, the results indicate that 5<sup>th</sup>-year students drink for more hours than all other students (Figure 4). Fifth-year students consume more drinks than 3<sup>rd</sup>- and 4<sup>th</sup>-year students, but about the same as 1<sup>st</sup>- and 2<sup>nd</sup>-year students. Past 2-week and 30 day patterns of consumption were similar across all five year-in-school groups.

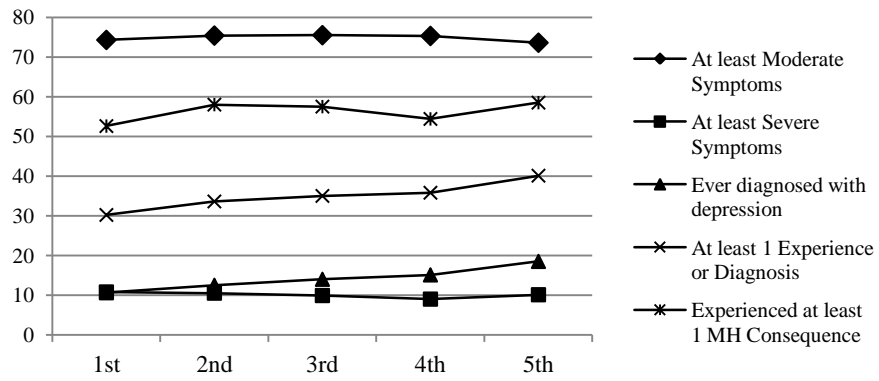


**Figure 3: Proportion of alcohol users by year in school, alcohol use variables**



**Figure 4: Quantity and Frequency of Alcohol use by Year in School**

Across the mental health variables, 5<sup>th</sup>-year students were more likely to be diagnosed with Depression and have at least one mental health experience or diagnosis than all other years-in-school (Figure 5). They also were more likely than 1<sup>st</sup>-, 3<sup>rd</sup>-, and 4<sup>th</sup>-year students to experience at least one mental health consequence, but about the same as 2<sup>nd</sup>-year students. Rates of Moderate and Severe mental health symptoms were about the same for all five year-in-school groups



**Figure 5: Proportion of students experiencing Mental Health Issues by Year in School**

## CHAPTER 5: RESULTS- FIFTH-YEAR STUDENT GROUP COMPARISONS

This chapter presents the descriptive statistics of the three 5<sup>th</sup>-year student group comparisons (sex, race, and GPA) across each of the variables: Alcohol Use, Alcohol Consequences, Mental Health Symptoms, Mental Health Experiences and Diagnoses, and Mental Health Consequence items. Alcohol Use items are presented for all students as well as just drinkers (students who answered at least “1” to each item). All of the results for the 5<sup>th</sup>-year male and female student comparison are presented first, followed by the 5<sup>th</sup>-year student racial group comparison results, and the 5<sup>th</sup>-year A/B GPA and C/D/F GPA student comparison results.

### Male and Female Fifth-Year Students

Among all students, male students drank significantly ( $p < 0.005$ ) more alcohol, more often than female students (Table 80). Among students who reported consuming alcohol, a greater proportion of male students reported consuming alcohol on all five items than female students: *Past 30 days use* (81.5% vs. 75.3%); *Hours of alcohol use* (86.0% vs. 84.8%); *Number of drinks consumed* (87.1% vs. 86.4%); *Number of occasions same amount of alcohol consumed in the past 2 weeks* (62.5% vs. 53.7%); and *Number of times in past 2 weeks 5 or more drinks consumed* (57.0% vs. 34.3%). Mean scores indicate that on average, males drink 6-9 days out of the month, compared to 3-5 days for females. Males drink an average of 7.38 (SD=4.57) drinks over 4.39 (SD=2.30) hours, while women consume 4.42 (SD=2.89) drinks over 3.57 (SD=1.91) hours. Mean scores



for male and female 5<sup>th</sup>-year students were statistically different for all items. In Table 80, positive t-scores indicate greater alcohol use among male 5<sup>th</sup>-year students; negative t-scores indicate greater use among female 5<sup>th</sup>-year students.

**Table 80: Alcohol Use Behavior Items: Fifth-year Male and Female Students**

			Males		Females		t-test	p	
	Range	%	M	SD	%	M			SD
<b>Alcohol Use Behaviors (all students)</b>									
Days of alcohol use during past 30 days	0-6		2.37	1.62		1.80	1.46	24.19	<.001
Hours of alcohol use last time “partied”	0-14		3.78	2.62		3.03	2.18	20.45	<.001
Number of drinks last time “partied”	0-23		6.43	4.93		3.82	3.08	40.56	<.001
Number of times in past 2 weeks drinking same or more alcohol as last time “partied”	0-10		1.51	1.84		1.11	1.51	15.82	<.001
Number of times in past 2 weeks more than 5 drinks consumed	0-9		1.76	2.19		0.76	1.42	34.43	<.001
<b>Alcohol Use Behaviors (drinkers only)</b>									
Days of alcohol use during past 30 days	1-6	81.5	2.91	1.29	75.3	2.39	1.20	24.37	<.001
Hours of alcohol use last time “partied”	1-14	86.0	4.39	2.30	84.8	3.57	1.91	23.57	<.001
Number of drinks last time “partied”	1-23	87.1	7.38	4.57	86.4	4.42	2.89	46.19	<.001
Number of times in past 2 weeks drinking same or more alcohol as last time “partied”	1-10	62.5	2.42	1.79	53.7	2.06	1.51	11.05	<.001
Number of times in past 2 weeks more than 5 drinks consumed	1-9	57.0	3.08	2.09	34.3	2.22	1.63	20.38	<.001

Note: Due to the use of bonferroni’s correction,  $p < .005$  is used to determine statistical significance. Positive t-scores indicate greater alcohol use among males; negative t-scores indicate greater use among females

As shown in Table 81, 51.6% of male 5<sup>th</sup>-year students experienced at least one consequence of alcohol use as compared to 40.7% of female 5<sup>th</sup>-year students. Males also were more likely to experience all of the itemized alcohol-related consequences than females. All comparisons resulted in a statistically significant chi-square ( $p < 0.05$ ) (Table 82). The results of the Cramer’s V test indicate weak effect sizes for the Physical Injury to Self, Did something you later regretted, and Forgot where you were or what you did items. A moderate effect size is indicated on all other consequence items.

**Table 81: Alcohol Use Consequence Items “Yes” Responses: Fifth-year Male and Female Students**

	Males N = 7,581	Females N = 10,520
	%	%
<b>Alcohol Consequences</b>		
Experienced at least 1 Consequence	51.6	40.7
<b>Alcohol Consequences</b>		
Physical injury to self	19.2	14.3
Physical injury to another person	7.6	2.4
Been involved in a fight	10.9	4.4
Did something you later regretted	38.5	29.9
Forgot where you were or what you did	31.6	22.3
Academic performance affected by alcohol use		
Yes, but did not affect GPA	11.5	7.0
Yes, but did affect GPA	4.2	1.7

**Table 82: Alcohol Use Consequence Items “Yes” Responses Comparison: Fifth-year Male and Female Students**

	X <sup>2</sup>	p	df	Cramer's V	Effect Size Interpretation
<b>Alcohol Consequences</b>					
Experienced at least 1 Consequence	210.62	<.001	1	.11	Moderate
<b>Alcohol Consequences</b>					
Physical injury to self	77.09	<.001	1	.07	Weak
Physical injury to another person	273.56	<.001	1	.12	Moderate
Been involved in a fight	276.43	<.001	1	.12	Moderate
Did something you later regretted	145.98	<.001	1	.09	Weak
Forgot where you were or what you did	193.84	<.001	1	.10	Weak
Academic performance affected by alcohol use	226.73	<.001	2	.11	Moderate

Results for the Mental Health Symptom variables that were coded as dichotomous Yes/No responses are found in Table 83. Males were more likely to experience only mild symptoms (17.6%) than female students (11.0%), but females were more likely to experience moderate (77.3%) and severe (10.5%) symptoms than males (68.4%, 9.6%). Females were significantly ( $p < 0.05$ ) more likely to experience each of the individual symptoms than males. Results of the chi-square analysis are presented in Table 84. The results of the Cramer's V test indicate weak effect sizes for felt hopeless and felt depressed, and moderate effect sizes for the overall index, felt overwhelmed, exhausted, and very sad variables, but negligible effect sizes for the felt suicidal and attempted suicide items.

**Table 83: Mental Health Symptoms Items “Yes” Responses: Fifth-year Male and Female Students**

	Males N = 7,581	Females N = 10,520
	%	%
<b>Index of Mental Health Symptoms</b>		
No Symptoms	4.4	1.2
Only Mild Symptoms	17.6	11.0
At least Moderate Symptoms	68.4	77.3
At least Severe Symptoms	9.6	10.5
<b>Mental Health Symptoms</b>		
Last year felt overwhelmed by all you had to do	90.9	97.5
Last year felt exhausted (not from physical activity)	88.4	95.4
Last year felt very sad	72.3	84.7
Last year felt things were hopeless	57.2	67.2
Last year felt so depressed it was difficult to function	39.6	48.6
Last year seriously considered attempting suicide	9.5	10.5
Last year attempted suicide	1.0	1.3

**Table 84: Mental Health Symptoms Items “Yes” Responses Comparison: Fifth-year Male and Female Students**

	X <sup>2</sup>	p	df	Cramer's V	Effect Size Interpretation
<b>Index of Mental Health Symptoms</b>	364.02	<.001	3	.14	Moderate
<b>Mental Health Symptoms</b>					
Last year felt overwhelmed by all you had to do	389.01	<.001	1	.15	Moderate
Last year felt exhausted (not from physical activity)	310.81	<.001	1	.13	Moderate
Last year felt very sad	414.14	<.001	1	.15	Moderate
Last year felt things were hopeless	189.79	<.001	1	.10	Weak
Last year felt so depressed it was difficult to function	143.10	<.001	1	.09	Weak
Last year seriously considered attempting suicide	4.10	.043	1	.02	Negligible
Last year attempted suicide	3.53	.060	1	.01	Negligible

For the three-level ordinal frequency response Mental Health items, a higher proportion of male students felt overwhelmed and exhausted 1-8 times in the previous school year than female students (Table 85). Female students were more likely to report feeling overwhelmed and exhausted 9 or more times. Across the moderate symptoms (very sad, hopeless, and depressed) females were more likely to experience them at both levels than males. For the severe symptoms, more female students reported feeling suicidal and attempting suicide 1-8 times, but males were more likely to report feeling suicidal and attempting suicide 9 or more times. All comparisons resulted in a significant

chi-square ( $p < 0.05$ ) (Table 86). The Cramer's V tests indicate negligible effect sizes for feeling suicidal and attempting suicide, weak effect sizes for felt hopeless and depressed, but strong effect sizes for exhausted, overwhelmed, and very sad.

As shown in Table 87, a higher proportion of female students (23.1%) have been diagnosed with Depression than male students (12.0%). Of those diagnosed with Depression, female students were more likely to be diagnosed in the last year (32.3%), are currently in therapy for Depression (23.1%), and are currently taking medicine for Depression (35.3) than male students (29.0%, 19.0%, and 27.6%). All comparisons resulted in a statistically significant chi-square ( $p < 0.05$ ), except for the diagnosed with depression in the last year item (Table 88). The results of the Cramer's V test indicate weak effect sizes for the Currently taking medication for depression item, negligible effect sizes for diagnosed in the past year and currently in therapy items, and a moderate effect size for the ever-diagnosed item.

**Table 85: Mental Health Symptoms Items Categorized Responses: Fifth-year Male and Female Students**

	Males N = 7,581	Females N = 10,520
	%	%
<b>Mental Health Symptoms</b>		
Last year felt overwhelmed by all you had to do		
Never	9.1	2.5
1-8 times	57.7	49.7
9 or more times	33.2	47.9
Last year felt exhausted (not from physical activity)		
Never	11.6	4.6
1-8 times	56.0	51.5
9 or more times	32.4	43.9
Last year felt very sad		
Never	27.7	15.3
1-8 times	55.9	62.2
9 or more times	16.4	22.5
Last year felt things were hopeless		
Never	42.8	32.8
1-8 times	44.3	51.9
9 or more times	12.9	15.3

**Table 85 (continued)**

Last year felt so depressed it was difficult to function		
Never	60.4	51.4
1-8 times	30.4	37.0
9 or more times	9.2	11.7
Last year seriously considered attempting suicide		
Never	90.5	89.5
1-8 times	8.2	9.4
9 or more times	1.3	1.0
Last year attempted suicide		
Never	99.0	98.7
1-8 times	0.9	1.3
9 or more times	0.1	0.0

**Table 86: Mental Health Symptoms Items Categorized Responses Comparison: Fifth-year Male and Female Students**

	X <sup>2</sup>	p	df	Cramer's V	Effect Size Interpretation
<b>Mental Health Symptoms</b>					
Last year felt overwhelmed by all you had to do	645.22	<.001	2	.19	Strong
Last year felt exhausted (not from physical activity)	450.77	<.001	2	.16	Strong
Last year felt very sad	441.60	<.001	2	.16	Strong
Last year felt things were hopeless	189.88	<.001	2	.10	Weak
Last year felt so depressed it was difficult to function	143.65	<.001	2	.09	Weak
Last year seriously considered attempting suicide	11.49	.003	2	.03	Negligible
Last year attempted suicide	13.28	.001	2	.03	Negligible

**Table 87: Depression Diagnosis, Therapy, and Medication Items: Fifth-year Male and Female Students**

	Males N = 7,581	Females N = 10,520
	%	%
<b>Depression</b>		
Ever diagnosed with depression	12.0	23.1
	N = 903	N = 2,416
	%	%
<b>Of those diagnosed with Depression</b>		
Diagnosed with depression in the last year	29.0	32.3
Currently in therapy for depression	19.0	23.1
Currently taking medicine for depression	27.6	35.3

**Table 88: Depression Diagnosis, Therapy, and Medication Items Comparison: Fifth-year Male and Female Students**

	X <sup>2</sup>	p	df	Cramer's V	Effect Size Interpretation
<b>Depression</b>					
Ever diagnosed with depression	356.38	<.001	1	.14	Moderate
Diagnosed with depression in the last year	3.31	.069	1	.03	Negligible
Currently in therapy for depression	6.27	.012	1	.04	Negligible
Currently taking medicine for depression	17.43	<.001	1	.07	Weak

Among the Mental Health Experience items, more females reported experiencing each of the issues, with the exception of Substance Abuse (Table 89). All comparisons were statistically significant ( $p < 0.05$ ), though the results of the Cramer's V test indicate negligible effect sizes for Anorexia and Chronic Fatigue Syndrome (Table 90). Weak effect sizes were observed for Bulimia, Depression, Seasonal Affective Disorder, and Substance Abuse. A moderate effect size was observed for Anxiety.

**Table 89: Experiences of Mental Health Disorders in Past Year Items: Fifth-year Male and Female Students**

	Males	Females
	N = 7,581	N = 10,520
	%	%
<b>Within the past year have you experienced:</b>		
Anorexia	0.6	1.8
Anxiety	10.6	18.9
Bulimia	0.7	3.2
Chronic fatigue	3.0	4.6
Depression	17.3	24.5
Seasonal Affective Disorder	6.2	9.8
Substance abuse	7.0	4.2

**Table 90: Experiences of Mental Health Disorders in Past Year Items Comparison: Fifth-year Male and Female Students**

	X <sup>2</sup>	p	df	Cramer's V	Effect Size Interpretation
<b>Within the past year have you experienced:</b>					
Anorexia	49.26	<.001	1	.05	Negligible
Anxiety	225.79	<.001	1	.11	Moderate
Bulimia	129.82	<.001	1	.09	Weak
Chronic fatigue	31.60	<.001	1	.04	Negligible
Depression	133.98	<.001	1	.09	Weak
Seasonal Affective Disorder	74.87	<.001	1	.07	Weak
Substance abuse	64.75	<.001	1	.06	Weak

Across all seven Mental Health Diagnoses items, significantly ( $p < 0.05$ ) higher proportions of female students had been diagnosed than male students, except for Substance Abuse (Table 91). Students were most likely to have been diagnosed with Anxiety and Depression. Thirteen percent of female and 6.1% of male students report a

diagnosis of Anxiety. Twenty percent of female students had been diagnosed with Depression, as had 11.4% of male students. Statistically significant chi-square values ( $p < 0.05$ ) were observed for all variables except for Substance Abuse (Table 92). The results of the Cramer's V test indicate negligible effect sizes for Chronic Fatigue Syndrome, Seasonal Affective Disorder, and Substance Abuse. Weak effect sizes were observed for Anorexia and Bulimia. Anxiety and Depression were moderate.

**Table 91: Lifetime Diagnosis of Mental Health Disorders Items: Fifth-year Male and Female Students**

	Males	Females
	N = 7,581	N = 10,520
	%	%
<b>Have you ever been diagnosed with:</b>		
Anorexia	0.5	3.7
Anxiety	6.1	13.6
Bulimia	0.7	3.3
Chronic fatigue	0.8	1.9
Depression	11.4	21.8
Seasonal Affective Disorder	1.9	3.6
Substance abuse	2.9	2.6

**Table 92: Lifetime Diagnosis of Mental Health Disorders Items Comparison: Fifth-year Male and Female Students**

	X <sup>2</sup>	p	df	Cramer's V	Effect Size Interpretation
<b>Have you ever been diagnosed with:</b>					
Anorexia	192.57	<.001	1	.10	Weak
Anxiety	252.88	<.001	1	.12	Moderate
Bulimia	127.28	<.001	1	.09	Weak
Chronic fatigue	34.06	<.001	1	.04	Negligible
Depression	324.42	<.001	1	.14	Moderate
Seasonal Affective Disorder	43.27	<.001	1	.05	Negligible
Substance abuse	1.93	.164	1	.01	Negligible

For the Mental Health Status, 45.8% of female students report at least one Experience or diagnosis, compared to 32.1% of male students (Table 93). Female students were more prone experiencing each disorder with or without a diagnosis across all items, with the exception of Substance Abuse. Results of the chi-square analysis are

presented in Table 94. Statistically significant chi-square values ( $p < 0.05$ ) were observed for all items. The results of the Cramer's V test indicate moderate effect sizes for overall status, Anorexia, Anxiety, Bulimia, and Depression. Weak effect sizes were observed for Seasonal Affective Disorder and Substance Abuse, while only a negligible effect size was observed for Chronic Fatigue Syndrome.

**Table 93: Status of Mental Health Disorders: Fifth-year Male and Female Students**

	Males N = 7,581	Females N = 10,520
	%	%
<b>Overall Status</b>		
At least 1 Experience or Diagnosis	32.1	45.8
<b>Disorder</b>		
<b>Anorexia</b>		
No Experiences/No Diagnosis	99.1	95.3
No Experiences/Yes Diagnosis	0.3	2.9
Yes Experiences/Yes Diagnosis	0.1	0.7
Yes Experiences/No Diagnosis	0.5	1.1
<b>Anxiety</b>		
No Experiences/No Diagnosis	87.9	78.3
No Experiences/Yes Diagnosis	1.3	2.8
Yes Experiences/Yes Diagnosis	4.8	10.8
Yes Experiences/No Diagnosis	5.9	8.2
<b>Bulimia</b>		
No Experiences/No Diagnosis	98.8	94.9
No Experiences/Yes Diagnosis	0.6	2.0
Yes Experiences/Yes Diagnosis	0.2	1.3
Yes Experiences/No Diagnosis	0.5	1.8
<b>Chronic fatigue</b>		
No Experiences/No Diagnosis	96.8	94.8
No Experiences/Yes Diagnosis	0.3	0.5
Yes Experiences/Yes Diagnosis	0.6	1.4
Yes Experiences/No Diagnosis	2.4	3.3
<b>Depression</b>		
No Experiences/No Diagnosis	78.6	68.1
No Experiences/Yes Diagnosis	4.0	7.3
Yes Experiences/Yes Diagnosis	7.5	14.6
Yes Experiences/No Diagnosis	9.9	10.0
<b>Seasonal Affective Disorder</b>		
No Experiences/No Diagnosis	93.3	89.5
No Experiences/Yes Diagnosis	0.4	0.6
Yes Experiences/Yes Diagnosis	1.5	3.0
Yes Experiences/No Diagnosis	4.8	6.9
<b>Substance abuse</b>		
No Experiences/No Diagnosis	91.7	94.2
No Experiences/Yes Diagnosis	1.3	1.6
Yes Experiences/Yes Diagnosis	1.6	1.0
Yes Experiences/No Diagnosis	5.4	3.2



**Table 94: Status of Mental Health Disorders Comparison: Fifth-year Male and Female Students**

	X <sup>2</sup>	p	df	Cramer's V	Effect Size Interpretation
<b>Overall Status</b>	323.06	<.001	1	.14	Moderate
<b>Disorder:</b>					
Anorexia	213.95	<.001	3	.11	Moderate
Anxiety	303.16	<.001	3	.13	Moderate
Bulimia	193.18	<.001	3	.11	Moderate
Chronic fatigue	45.30	<.001	3	.05	Negligible
Depression	325.08	<.001	3	.14	Moderate
Seasonal Affective Disorder	79.72	<.001	3	.07	Weak
Substance abuse	67.09	<.001	3	.07	Weak

As shown in Table 95, 57.1% of male students and 59.9% of female students experienced at least one mental health related consequence. Males were more likely to experience consequences resulting from ADD, Internet use/Computer games, and Learning Disability. With the exception of Learning Disability and Sleep difficulty, all comparisons resulted in a statistically significant chi-square ( $p < 0.05$ ), though the results of the Cramer's V test indicate most of the relationships were weak or negligible. Only Internet use/Computer games indicated a strong effect size (Table 96).

**Table 95: Mental Health Consequences on Academic Performance Items "Yes" Responses: Fifth-year Male and Female Students**

	Males N = 7,581	Females N = 10,520
	%	%
<b>Academic Performance Affected by:</b>		
Experienced at least 1 Consequence	57.1	59.9
Attention Deficit Disorder	12.4	7.6
Concern for friend or family member	17.9	24.8
Death of friend or family member	9.5	13.2
Depression/Anxiety/SAD	16.2	23.2
Eating Disorder	0.7	1.9
Internet use/Computer games	21.4	9.0
Learning disability	5.9	5.4
Relationship difficulty	18.4	20.9
Sleep difficulty	27.2	28.4
Stress	32.4	41.3

**Table 96: Mental Health Consequences on Academic Performance Items “Yes” Responses Comparison: Fifth-year Male and Female Students**

	X <sup>2</sup>	p	df	Cramer’s V	Effect Size Interpretation
<b>Academic Performance Affected by:</b>					
Experienced at least 1 Consequence	13.93	<.001	1	.03	Negligible
Attention Deficit Disorder	115.85	<.001	1	.08	Weak
Concern for friend or family member	122.30	<.001	1	.08	Weak
Death of friend or family member	56.62	<.001	1	.06	Weak
Depression/Anxiety/SAD	132.52	<.001	1	.09	Weak
Eating Disorder	41.81	<.001	1	.05	Negligible
Internet use/Computer games	551.49	<.001	1	.18	Strong
Learning disability	1.92	.166	1	.01	Negligible
Relationship difficulty	16.94	<.001	1	.03	Negligible
Sleep difficulty	3.33	.068	1	.01	Negligible
Stress	147.42	<.001	1	.09	Weak

Results also were calculated for the Mental Health Consequences variables expanded to report the impact of the consequence on grade point average. As shown in Table 97, the results mirror those of the previous table with a larger proportion of female students reported experiencing consequences, regardless of effect on GPA than male students, on all items with the exception of ADD, Internet use/Computer games, and Learning Disability. On the Sleep difficulty item, although more females (28.4%) reported the consequence overall than males (27.1%), males were more likely to report decreased GPA as a result. With the exception of Learning Disability, all comparisons resulted in a statistically significant chi-square ( $p < 0.05$ ). The results of the Cramer’s V test indicate the relationships were weak at best, except for the Internet Use/Computer games item in which there was a strong effect size (Table 98).

**Table 97: Mental Health Consequences on Academic Performance Items Categorized “Yes” Responses: Fifth-year Male and Female Students**

	Males N = 7,581	Females N = 10,520
	%	%
<b>Academic Performance Affected by:</b>		
Attention Deficit Disorder		
Yes, but did not affect GPA	7.3	4.7
Yes, did affect GPA	5.2	2.9
Concern for friend or family member		
Yes, but did not affect GPA	13.8	19.3
Yes, did affect GPA	4.1	5.5
Death of friend or family member		
Yes, but did not affect GPA	6.8	9.0
Yes, did affect GPA	2.8	4.2
Depression/Anxiety/SAD		
Yes, but did not affect GPA	10.5	15.6
Yes, did affect GPA	5.7	7.7
Eating Disorder		
Yes, but did not affect GPA	0.5	1.3
Yes, did affect GPA	0.2	0.6
Internet use/Computer games		
Yes, but did not affect GPA	16.0	7.3
Yes, did affect GPA	5.4	1.7
Learning disability		
Yes, but did not affect GPA	3.3	3.1
Yes, did affect GPA	2.6	2.3
Relationship difficulty		
Yes, but did not affect GPA	13.3	15.4
Yes, did affect GPA	5.1	5.3
Sleep difficulty		
Yes, but did not affect GPA	20.7	22.4
Yes, did affect GPA	6.5	6.0
Stress		
Yes, but did not affect GPA	24.1	30.3
Yes, did affect GPA	8.3	11.1

**Table 98: Mental Health Consequences on Academic Performance Items Categorized “Yes” Responses Comparison: Fifth-year Male and Female Students**

	X <sup>2</sup>	p	df	Cramer’s V	Effect Size Interpretation
<b>Academic Performance Affected by:</b>					
Attention Deficit Disorder	117.35	<.001	2	.08	Weak
Concern for friend or family member	122.67	<.001	2	.09	Weak
Death of friend or family member	58.32	<.001	2	.06	Weak
Depression/Anxiety/SAD	134.03	<.001	2	.09	Weak
Eating Disorder	41.82	<.001	2	.05	Negligible
Internet use/Computer games	564.36	<.001	2	.18	Strong
Learning disability	2.12	.347	2	.01	Negligible
Relationship difficulty	17.89	<.001	2	.03	Negligible
Sleep difficulty	8.20	.017	2	.02	Negligible
Stress	148.36	<.001	2	.09	Weak

### Fifth-year students by Racial Group

Among all students, the highest frequency and quantity of consumption of alcohol occurred among Whites and No Race Reported (Table 99). Both Whites and those not reporting race consumed alcohol 3-5 of the past 30 days, compared to 1-2 days for all other racial categories. Whites and No Race Reported also drank approximately 5 drinks over 3.5 hours, more than all other racial groups. Blacks reported the least consumption of any racial group.

Among students who reported consuming alcohol, a greater proportion of Whites and No Race Reported consumed alcohol on all five items than all other racial categories (Table 99). On average, Whites and No Race Reported drank six drinks over more than four hours. Mean scores of the Past 30 day use variable were similar for all groups, though No Race reported ( $M=2.84$ ) was much closer to 6-9 days of use than all of the other racial groups. The only item in which Whites and No Race Reported were not the highest group was *Number of occasions same amount of alcohol consumed in the past 2 weeks*. For that variable, the “Other” category indicated the most occasions on average ( $M=2.33$ ). Blacks reported the least amount of alcohol consumption and the smallest proportion of drinkers than all other racial categories. The results of the one-way ANOVA test for differences among groups indicated that the groups differed significantly ( $p<0.005$ ) across all alcohol use items (Table 100).

**Table 99: Alcohol Use Behavior Items: Fifth-year Students by Race (White, Black, Hispanic, Native American, Other, More than 1 Race, No Race Reported).**

	Range	White N = 14,076		Black N = 913		Hispanic N = 990		Asian N = 1,223		Native Amer N = 92		Other N = 525		More than 1 Race N = 663		No Race Reported N = 106	
		%	M (SD)	%	M (SD)	%	M (SD)	%	M (SD)	%	M (SD)	%	M (SD)	%	M (SD)	%	M (SD)
<b>Alcohol Use Behaviors (all students)</b>																	
Days of alcohol use during past 30 days	0-6		2.18 (1.54)		1.26 (1.45)		1.75 (1.54)		1.32 (1.44)		1.65 (1.44)		1.83 (1.56)		1.88 (1.58)		2.23 (1.59)
Hours of alcohol use last time “partied”	0-14		3.60 (2.41)		1.85 (1.97)		2.86 (2.21)		2.20 (2.03)		3.12 (2.35)		2.99 (2.42)		3.08 (2.26)		3.56 (2.57)
Number of drinks last time “partied”	0-23		5.32 (4.28)		2.78 (2.89)		4.17 (3.66)		3.12 (3.14)		4.58 (3.90)		4.28 (3.95)		4.30 (3.84)		5.23 (4.41)
Number of times in past 2 weeks drinking same or more alcohol as last time “partied”	0-10		1.36 (1.72)		0.88 (1.45)		1.13 (1.50)		0.90 (1.38)		1.03 (1.49)		1.23 (1.71)		1.13 (1.50)		1.25 (1.48)
Number of times in past 2 weeks more than 5 drinks consumed	0-9		1.31 (1.93)		0.52 (1.27)		0.89 (1.66)		0.63 (1.35)		0.96 (1.68)		1.02 (1.80)		0.95 (1.70)		1.40 (1.90)
<b>Alcohol Use Behaviors (drinkers only)</b>																	
Days of alcohol use during past 30 days	1-6	80.9	2.68 (1.26)	56.6	2.21 (1.26)	70.8	2.45 (1.26)	59.9	2.20 (1.23)	72.8	2.27 (1.20)	71.8	2.51 (1.28)	75.0	2.49 (1.33)	78.3	2.84 (1.21)
Hours of alcohol use last time “partied”	1-14	87.1	4.11 (2.13)	69.6	2.63 (1.86)	82.3	3.43 (1.98)	74.2	2.95 (1.82)	81.5	3.83 (2.02)	79.6	3.69 (2.15)	83.1	3.68 (1.97)	82.1	4.22 (2.24)
Number of drinks last time “partied”	1-23	88.2	6.00 (4.08)	73.2	3.75 (2.76)	84.6	4.87 (3.50)	76.9	4.03 (3.01)	84.8	5.40 (3.67)	80.8	5.23 (3.75)	84.5	5.07 (3.67)	84.0	6.11 (4.16)
Number of times in past 2 weeks drinking same or more alcohol as last time “partied”	1-10	59.3	2.27 (1.69)	42.1	2.07 (1.58)	53.1	2.10 (1.47)	45.9	1.94 (1.44)	52.2	1.98 (1.54)	52.0	2.33 (1.72)	52.6	2.12 (1.45)	62.3	1.97 (1.42)
Number of times in past 2 weeks more than 5 drinks consumed	1-9	47.4	2.75 (1.95)	23.0	2.25 (1.76)	35.7	2.47 (1.93)	26.7	2.31 (1.69)	40.2	2.38 (1.92)	38.3	2.54 (1.93)	36.8	2.54 (1.93)	51.9	2.69 (1.86)

**Table 100: Alcohol Use Behavior Items ANOVA Table: Fifth-year Students by Race**

	F	p
<b>Alcohol Use Behaviors (all students)</b>		
Days of alcohol use during past 30 days	98.59	<.001
Hours of alcohol use last time “partied”	125.76	<.001
Number of drinks last time “partied”	96.04	<.001
Number of times in past 2 weeks drinking same or more alcohol as last time “partied”	23.04	<.001
Number of times in past 2 weeks more than 5 drinks consumed	48.31	<.001
<b>Alcohol Use Behaviors (drinkers only)</b>		
Days of alcohol use during past 30 days	27.55	<.001
Hours of alcohol use last time “partied”	84.41	<.001
Number of drinks last time “partied”	66.43	<.001
Number of times in past 2 weeks drinking same or more alcohol as last time “partied”	5.09	<.001
Number of times in past 2 weeks more than 5 drinks consumed	5.20	<.001

Note: Due to the use of bonferroni’s correction,  $p < .005$  is used to determine statistical significance

The results of the Alcohol Consequences analysis indicates that Whites (48.7%) were most likely to report experiencing at least one consequence while Blacks (27.1%) were the least likely to report experiencing at least one consequence (Table 101). Among the individual consequences, the No Race Reported group was the most likely to report experiencing physical injury to self and to another, as well as being involved in a fight. Both Whites and the No Race Reported group had the highest proportion of those who forgot where they were or what they did. Native Americans had the highest proportion of students reporting doing something they later regretted, as well as academic consequences that did not affect GPA. Whites and Hispanics were most likely to experience academic consequences that lowered GPA. All comparisons resulted in a statistically significant chi-square ( $p < 0.05$ ) (Table 102). The results of the Cramer’s V test indicate a weak effect size on the Physical injury to self item, and negligible effect sizes for the Physical injury to another, Been in a fight, and academic consequences items. Moderate effect sizes were observed for the Overall consequences, regret, and forgot what you did or where you were items.

**Table 101: Alcohol Use Consequence Items “Yes” Responses: Fifth-year Students by Race**

	White	Black	Hispanic	Asian	Native Amer.	Other	More than 1 Race	No Race
	N =	N =	N =	N =	N =	N =	N =	N =
	14,076	913	990	1,223	92	525	663	106
	%	%	%	%	%	%	%	%
<b>Alcohol Consequences</b>								
Experienced at least 1 Consequence	48.7	27.1	39.8	28.6	44.0	39.9	42.3	45.6
Physical injury to self	18.1	4.8	12.9	9.5	17.4	14.9	14.0	20.2
Physical injury to another person	5.1	1.8	2.8	2.5	2.2	5.2	4.4	6.7
Been involved in a fight	7.7	4.2	6.0	3.4	5.5	7.9	6.8	8.5
Did something you later regretted	36.6	17.9	27.4	19.2	37.0	28.3	31.0	29.8
Forgot where you were or what you did	28.6	12.8	22.9	15.4	23.9	20.5	22.4	28.6
Academic performance affected by alcohol use								
Yes, but did not affect GPA	9.6	4.5	8.2	5.4	12.2	7.8	6.7	10.7
Yes, did affect GPA	3.1	1.0	3.1	1.3	1.1	2.3	2.5	0.0

**Table 102: Alcohol Use Consequence Items “Yes” Responses Comparison: Fifth-year Students by Race**

	X <sup>2</sup>	p	df	Cramer's V	Effect Size Interpretation
<b>Alcohol Consequences</b>					
Experienced at least 1 Consequence	337.47	<.001	7	.14	Moderate
<b>Alcohol Consequences</b>					
Physical injury to self	174.80	<.001	7	.10	Weak
Physical injury to another person	45.32	<.001	7	.05	Negligible
Been involved in a fight	47.11	<.001	7	.05	Negligible
Did something you later regretted	295.31	<.001	7	.13	Moderate
Forgot where you were or what you did	219.03	<.001	7	.11	Moderate
Academic performance affected by alcohol use	86.73	<.001	14	.05	Negligible

Table 103 reports the results for the Mental Health Symptom variables that were coded as dichotomous Yes/No responses. For the overall symptom variable, Whites were most likely to experience only Mild Symptoms, Native Americans were most likely to experience at least Moderate Symptoms, and the No Race Reported group were the most likely to experience Severe Symptoms. Across individual symptoms, the No Race Reported group was most likely to experience feeling overwhelmed, exhausted, very sad, and seriously considered attempting suicide. Asians had the highest proportion of students feeling hopeless, depressed, and attempting suicide. No one racial group emerged as the least likely to experience any of the symptoms. All comparisons resulted

in a statistically significant chi-square ( $p < 0.05$ ), except for the felt very sad item (Table 104). The results of the Cramer's V test indicate weak effect sizes for the felt hopeless and felt depressed items. Negligible effect sizes were observed for all variables.

**Table 103: Mental Health Symptom Items “Yes” Responses: Fifth-year Students by Race**

	White	Black	Hispanic	Asian	Native Amer	Other	More than 1 Race	No Race
	N =	N =	N =	N =	N =	N =	N =	N =
	14,076	913	990	1,223	92	525	663	106
	%	%	%	%	%	%	%	%
<b>Overall Mental Health Symptoms</b>								
No Symptoms	2.4	3.7	3.0	2.9	5.4	4.4	2.3	1.0
Only Mild Symptoms	14.3	12.0	13.7	9.7	10.9	11.2	12.1	11.5
At least Moderate Symptoms	73.7	72.6	74.5	74.0	78.3	69.1	73.2	70.2
At least Severe Symptoms	9.5	11.7	8.9	13.5	5.4	15.3	12.4	17.3
<b>Mental Health Symptoms</b>								
Last year felt overwhelmed by all you had to do	95.1	91.6	93.7	93.8	91.3	92.3	94.2	99.0
Last year felt exhausted (not from physical activity)	92.8	88.8	91.9	92.5	85.9	89.6	93.3	95.2
Last year felt very sad	79.3	78.7	78.1	81.7	78.3	80.3	81.6	85.6
Last year felt things were hopeless	61.6	63.1	64.9	74.0	60.9	66.5	65.7	64.1
Last year felt so depressed it was difficult to function	43.6	45.7	43.6	52.8	41.8	51.2	51.5	43.3
Last year seriously considered attempting suicide	9.5	11.5	8.9	13.3	5.4	15.2	12.4	17.3
Last year attempted suicide	0.9	2.2	1.5	2.9	0.0	1.9	1.8	1.0

**Table 104: Mental Health Symptom Items “Yes” Responses Comparison: Fifth-year Students by Race**

	X <sup>2</sup>	p	df	Cramer's V	Effect Size Interpretation
<b>Overall Mental Health Symptoms</b>	89.62	<.001	21	.04	Negligible
<b>Mental Health Symptoms</b>					
Last year felt overwhelmed by all you had to do	37.62	<.001	7	.05	Negligible
Last year felt exhausted (not from physical activity)	33.54	<.001	7	.04	Negligible
Last year felt very sad	10.11	.183	7	.02	Negligible
Last year felt things were hopeless	81.34	<.001	7	.07	Weak
Last year felt so depressed it was difficult to function	61.09	<.001	7	.06	Weak
Last year seriously considered attempting suicide	50.23	<.001	7	.05	Negligible
Last year attempted suicide	51.02	<.001	7	.05	Negligible

Table 105 reports the results of the Mental Health Symptoms variables coded as three-level ordinal frequency responses. The expansion of the responses resulted in a



much more varied pattern of symptom experience across racial groups. Blacks (62.5%) and Whites (47.1%) were most likely to report feeling exhausted 1-8 times and 9 or more times, respectively, than other groups. Blacks (57.0%) and the No Race Reported group (42.9%) were most likely to report feeling overwhelmed 1-8 times and 9 or more times, respectively. Across the Mild symptoms, the No Race Reported (67.3%) and Other race (26.1%) groups were most likely to report feeling very sad 1-8 times and 9 or more times, respectively. Asians and the Other race group were most likely to experience feeling hopeless (57.5% and 19.3%) and depressed (39.8% and 16.4%) 1-8 times and 9 times or more, respectively. For the severe symptoms, more No Race Reported students felt suicidal 1-8 times (14.4%) and 9 times or more (2.9%) than other racial groups. Asian (2.7%) and the More than 1 Race reported group (0.8%) were the most likely to attempt suicide 1-8 times, and 9 or more times, respectively. All comparisons resulted in a statistically significant chi-square ( $p < 0.05$ ) (Table 106). The results of the Cramer's V test indicate a weak effect size for feeling overwhelmed, but negligible effect sizes for all other variables.

**Table 105: Mental Health Symptom Items Categorized Responses: Fifth-year Students by Race**

	White	Black	Hispanic	Asian	Native Amer	Other	More than 1 Race	No Race
	N =	N =	N =	N =	N =	N =	N =	N =
	14,076	913	990	1,223	92	525	663	106
	%	%	%	%	%	%	%	%
<b>Mental Health Symptoms</b>								
Last year felt overwhelmed by all you had to do								
Never	4.9	8.4	6.3	6.2	8.7	7.7	5.8	1.0
1-8 times	52.0	62.5	55.6	56.8	58.7	50.9	50.5	51.9
9 or more times	47.1	43.1	29.0	38.1	37.1	32.6	41.4	43.8
Last year felt exhausted (not from physical activity)								
Never	7.2	11.2	8.1	7.5	14.1	10.4	6.7	4.8
1-8 times	52.9	57.0	56.8	56.2	47.8	49.3	53.2	52.4
9 or more times	39.9	31.8	35.1	36.3	38.0	40.2	40.1	42.9

**Table 105 (continued)**

Last year felt very sad								
Never	20.7	21.3	21.9	18.3	21.7	19.7	18.4	14.4
1-8 times	59.5	61.1	59.9	61.3	63.0	54.2	59.2	67.3
9 or more times	19.8	17.6	18.3	20.4	15.2	26.1	22.5	18.3
Last year felt things were hopeless								
Never	38.4	36.9	35.1	26.0	39.1	33.5	34.3	35.9
1-8 times	47.7	49.4	51.0	57.5	51.1	47.2	50.0	49.5
9 or more times	13.9	13.7	13.8	16.5	9.8	19.3	15.7	14.6
Last year felt so depressed it was difficult to function								
Never	56.4	54.3	56.4	47.2	58.2	48.8	48.5	56.7
1-8 times	33.4	35.9	33.9	39.8	35.2	34.7	38.0	31.7
9 or more times	10.2	9.8	9.7	12.9	6.6	16.4	13.5	11.5
Last year seriously considered attempting suicide								
Never	90.5	88.5	91.1	86.7	94.6	84.8	87.6	82.7
1-8 times	8.5	9.9	7.1	11.1	5.4	13.9	10.5	14.4
9 or more times	1.0	1.7	1.7	2.1	0.0	1.3	2.0	2.9
Last year attempted suicide								
Never	99.1	97.8	98.5	97.1	100.00	98.1	98.2	99.0
1-8 times	0.9	2.2	1.2	2.7	0.0	1.7	1.1	1.0
9 or more times	0.0	0.0	0.3	0.2	0.0	0.2	0.8	0.0

**Table 106: Mental Health Symptom Items Categorized Responses Comparison: Fifth-year Students by Race**

	X <sup>2</sup>	p	df	Cramer's V	Effect Size Interpretation
<b>Mental Health Symptoms</b>					
Last year felt overwhelmed by all you had to do	113.90	<.001	14	.06	Weak
Last year felt exhausted (not from physical activity)	61.45	<.001	14	.04	Negligible
Last year felt very sad	30.19	.007	14	.03	Negligible
Last year felt things were hopeless	92.46	<.001	14	.05	Negligible
Last year felt so depressed it was difficult to function	77.58	<.001	14	.05	Negligible
Last year seriously considered attempting suicide	66.04	<.001	14	.04	Negligible
Last year attempted suicide	96.96	<.001	14	.05	Negligible

Across the Depression items, 20.2% of Whites reported ever being diagnosed with depression (Table 107). Although Blacks had the lowest proportion of students ever diagnosed with depression (8.4%) they had the highest proportion of students who had been diagnosed in the last year. The More than 1 Race Reported and No Race Reported groups were most likely to be in therapy for depression (28.2%) and taking medication for depression (40%), respectively. All comparisons resulted in a statistically significant chi-square ( $p < 0.05$ ), except for the currently in therapy item (Table 108). The results of

the Cramer's V test indicate a negligible effect size for the currently in therapy item and weak effect sizes for the other three items.

**Table 107: Depression Diagnosis, Therapy, and Medication Items: Fifth-year Students by Race**

	White	Black	Hispanic	Asian	Native Amer	Other	More than 1 Race	No Race
	N = 14,076	N = 913	N = 990	N = 1,223	N = 92	N = 525	N = 663	N = 106
	%	%	%	%	%	%	%	%
<b>Depression</b>								
Ever diagnosed with depression	20.2	8.4	13.5	9.1	16.3	19.0	20.0	14.6
	N = 2820	N = 76	N = 133	N = 110	N = 15	N = 98	N = 132	N = 15
	%	%	%	%	%	%	%	%
<b>Of those diagnosed with Depression</b>								
Diagnosed with depression in the last year	30.5	43.4	39.4	41.5	26.7	28.6	33.6	26.7
Currently in therapy for depression	21.1	27.6	25.8	23.6	20.0	25.5	28.2	20.0
Currently taking medicine for depression	34.0	30.3	30.3	20.0	6.7	29.6	39.7	40.0

**Table 108: Depression Diagnosis, Therapy, and Medication Items Comparison: Fifth-year Students by Race**

	X <sup>2</sup>	p	df	Cramer's V	Effect Size Interpretation
<b>Depression</b>					
Ever diagnosed with depression	176.12	<.001	7	.10	Weak
Diagnosed with depression in the last year	16.12	.024	7	.07	Weak
Currently in therapy for depression	7.63	.366	7	.05	Negligible
Currently taking medicine for depression	17.90	.012	7	.07	Weak

Table 109 reports the results for the Mental Health Experience items. A higher proportion of Other Race students experienced Anorexia (2.5%), Chronic Fatigue Syndrome (6.2%), and Seasonal Affective Disorder (10.4%). The students reporting more than one race were most likely to report experiencing Anxiety (19.1%), Bulimia (3.4%), and Depression (27.0%). Substance Abuse was most likely to be reported by the No Race Reported students (8.2%) than all other racial groups. All comparisons resulted in a statistically significant chi-square ( $p < 0.05$ ) (Table 110). The results of the Cramer's

V test indicate weak effect sizes for Anxiety and Seasonal Affective Disorder. Negligible effect sizes were observed for all other variables.

**Table 109: Experiences of Mental Health Disorders in Past Year Items: Fifth-year Students by Race**

	White	Black	Hispanic	Asian	Native Amer.	Other	More than 1 Race	No Race
	N =	N =	N =	N =	N =	N =	N =	N =
	14,076	913	990	1,223	92	525	663	106
	%	%	%	%	%	%	%	%
<b>Within the past year have you experienced:</b>								
Anorexia	1.4	0.8	0.9	0.4	2.2	2.5	1.8	1.0
Anxiety	16.4	6.9	12.1	9.7	19.1	16.7	19.4	12.1
Bulimia	2.3	0.9	1.3	1.5	1.1	2.7	3.4	2.0
Chronic fatigue	3.9	3.1	2.6	3.8	3.4	6.2	5.2	4.0
Depression	21.9	17.8	19.3	16.6	14.6	25.9	27.0	19.0
Seasonal Affective Disorder	9.0	2.4	3.9	6.3	2.2	10.4	10.1	10.1
Substance abuse	5.8	3.5	3.5	2.3	5.6	6.1	4.8	8.2

**Table 110: Experiences of Mental Health Disorders in Past Year Items Comparison: Fifth-year Students by Race**

	X <sup>2</sup>	p	df	Cramer's V	Effect Size Interpretation
<b>Within the past year have you experienced:</b>					
Anorexia	18.66	.009	7	.03	Negligible
Anxiety	108.44	<.001	7	.08	Weak
Bulimia	18.69	.009	7	.03	Negligible
Chronic fatigue	16.24	.023	7	.03	Negligible
Depression	48.83	<.001	7	.05	Negligible
Seasonal Affective Disorder	89.66	<.001	7	.07	Weak
Substance abuse	42.65	<.001	7	.05	Negligible

Across all seven Mental Health Diagnoses items, higher proportions of White students had been diagnosed with Anorexia (2.7%) and Depression (19.2%) than other racial groups (Table 111). Native Americans were most likely to report diagnoses of Anxiety (12.2%) and Substance Abuse (5.5%). Chronic Fatigue Syndrome was most likely to be diagnosed in Other Race students (3.1%). The highest proportion of those diagnosed with Bulimia and Seasonal Affective Disorder were the More than 1 Race group, 2.8% and 3.8%, respectively. Results of the chi-square analysis are presented in Table 112. Statistically significant chi-square values ( $p < 0.05$ ) were observed for all

variables. The results of the Cramer's V test indicate weak effect sizes for Anxiety and Depression. Negligible effect sizes were observed for all other variables.

**Table 111: Lifetime Diagnoses of Mental Health Disorders Items: Fifth-year Students by Race**

	White	Black	Hispanic	Asian	Native Amer	Other	More than 1 Race	No Race
	N =	N =	N =	N =	N =	N =	N =	N =
	14,076	913	990	1,223	92	525	663	106
	%	%	%	%	%	%	%	%
<b>Have you ever been diagnosed with:</b>								
Anorexia	2.7	0.9	1.3	1.0	1.1	2.2	2.1	1.0
Anxiety	11.4	4.6	7.5	4.5	12.2	11.0	11.5	11.1
Bulimia	2.4	1.3	1.8	1.1	1.1	3.1	2.8	0.0
Chronic fatigue	1.6	0.6	0.9	0.3	0.0	3.1	2.3	0.0
Depression	19.2	8.5	12.4	7.3	13.3	18.1	18.9	14.0
Seasonal Affective Disorder	3.3	0.9	1.1	1.1	0.0	3.4	3.8	3.2
Substance abuse	3.0	1.4	1.9	1.2	5.5	4.3	2.3	4.2

**Table 112: Lifetime Diagnoses of Mental Health Disorders Items Comparison: Fifth-year Students by Race**

	X <sup>2</sup>	p	df	Cramer's V	Effect Size Interpretation
<b>Have you ever been diagnosed with:</b>					
Anorexia	29.24	<.001	7	.04	Negligible
Anxiety	101.30	<.001	7	.08	Weak
Bulimia	18.97	.008	7	.03	Negligible
Chronic fatigue	35.98	<.001	7	.05	Negligible
Depression	183.02	<.001	7	.10	Weak
Seasonal Affective Disorder	48.41	<.001	7	.05	Negligible
Substance abuse	30.59	<.001	7	.04	Negligible

For Mental Health Status, 45% of the More than 1 Race group reported at least one Experience or diagnosis, more than any other racial group (Table 113). The most at-risk group (Yes experience/No diagnosis) for each disorder was as follows: *Anorexia*, Other (2.2%); *Anxiety*, Native American (11.2%); *Bulimia*, No Race (2.1%); *Chronic Fatigue Syndrome*, Other (4.2%); *Depression*, More than 1 Race (13.5%); *Seasonal Affective Disorder*, Other (8.2%); and *Substance Abuse*, No Race (6.5%). Results of the chi-square analysis are presented in Table 114. Statistically significant chi-square values ( $p < 0.05$ ) were observed for all items, though negligible effect sizes were observed for

most of the variables. Weak effect sizes were observed for the Overall Status and Depression items.

**Table 113: Status of Mental Health Disorders in Past Year: Fifth-year Students by Race**

	White	Black	Hispanic	Asian	Native Amer	Other	More than 1 Race	No Race
	N =	N =	N =	N =	N =	N =	N =	N =
	14,076	913	990	1,223	92	525	663	106
	%	%	%	%	%	%	%	%
<b>Overall Status</b>								
At least 1 Experience or Diagnosis	41.9	28.6	32.8	28.6	33.0	44.2	45.0	41.1
<b>Disorder</b>								
<b>Anorexia</b>								
No Experiences/No Diagnosis	96.5	98.5	98.0	98.9	96.6	95.9	96.6	98.0
No Experiences/Yes Diagnosis	2.1	0.7	1.0	0.7	1.1	1.6	1.5	1.0
Yes Experiences/Yes Diagnosis	0.6	0.0	0.2	0.2	0.0	0.6	0.6	0.0
Yes Experiences/No Diagnosis	1.0	0.8	0.8	0.7	0.3	2.2	2.0	1.2
<b>Anxiety</b>								
No Experiences/No Diagnosis	81.1	91.6	86.4	89.3	76.4	81.3	78.1	83.5
No Experiences/Yes Diagnosis	2.4	1.4	1.4	0.9	4.5	1.6	2.3	4.1
Yes Experiences/Yes Diagnosis	9.0	3.0	6.0	3.7	7.9	9.3	9.3	7.2
Yes Experiences/No Diagnosis	7.4	4.0	6.2	6.1	11.2	7.8	10.3	5.2
<b>Bulimia</b>								
No Experiences/No Diagnosis	96.2	98.2	97.3	97.9	97.8	94.8	95.4	97.9
No Experiences/Yes Diagnosis	1.5	0.9	1.4	0.6	1.1	2.4	1.2	0.0
Yes Experiences/Yes Diagnosis	0.9	0.2	0.4	0.5	0.0	0.8	1.5	0.0
Yes Experiences/No Diagnosis	1.3	0.6	0.8	1.0	1.1	2.0	1.8	2.1
<b>Chronic fatigue</b>								
No Experiences/No Diagnosis	95.6	96.7	97.1	96.0	96.6	92.6	94.4	95.9
No Experiences/Yes Diagnosis	0.4	0.1	0.3	0.1	0.0	1.0	0.3	0.0
Yes Experiences/Yes Diagnosis	1.1	0.5	0.6	0.2	0.0	2.2	1.9	0.0
Yes Experiences/No Diagnosis	2.8	2.7	1.9	3.7	3.4	4.2	3.4	4.1
<b>Depression</b>								
No Experiences/No Diagnosis	71.3	79.3	76.5	81.4	80.9	69.3	67.8	74.7
No Experiences/Yes Diagnosis	6.7	2.6	4.0	1.9	4.5	4.6	5.1	6.1
Yes Experiences/Yes Diagnosis	12.6	6.1	8.6	5.5	9.0	13.5	13.7	8.1
Yes Experiences/No Diagnosis	9.4	12.0	11.0	11.1	5.6	12.5	13.5	11.1
<b>Seasonal Affective Disorder</b>								
No Experiences/No Diagnosis	90.3	97.4	95.7	93.7	97.8	88.4	88.7	91.4
No Experiences/Yes Diagnosis	0.7	0.1	0.3	0.0	0.0	1.0	1.1	0.0
Yes Experiences/Yes Diagnosis	2.6	0.7	0.8	1.1	0.0	2.4	2.8	3.2
Yes Experiences/No Diagnosis	6.4	1.8	3.2	5.2	2.2	8.2	7.4	5.4
<b>Substance abuse</b>								
No Experiences/No Diagnosis	92.5	95.9	95.5	96.9	93.3	91.4	93.8	89.2
No Experiences/Yes Diagnosis	1.6	0.6	1.0	0.7	1.1	2.4	1.4	3.2
Yes Experiences/Yes Diagnosis	1.3	0.8	1.0	0.5	3.4	2.0	0.9	1.1
Yes Experiences/No Diagnosis	4.5	2.7	2.6	1.9	2.0	4.2	3.9	6.5

**Table 114: Status of Mental Health Disorders in Past Year Comparison: Fifth-year Students by Race**

	X <sup>2</sup>	p	df	Cramer's V	Effect Size Interpretation
<b>Overall Status</b>	159.34	<.001	7	.10	Weak
<b>Disorder</b>					
Anorexia	52.39	<.001	21	.03	Negligible
Anxiety	148.06	<.001	21	.05	Negligible
Bulimia	36.53	.019	21	.03	Negligible
Chronic fatigue	47.85	.001	21	.03	Negligible
Depression	207.28	<.001	21	.06	Weak
Seasonal Affective Disorder	112.03	<.001	21	.05	Negligible
Substance abuse	66.51	<.001	21	.04	Negligible

As shown in Table 115, 66.6% of the More than 1 Race Reported students experienced at least one mental health related consequence, the most of any racial group. Across all of the consequences, Hispanics (1.8%) were most likely to experience consequences resulting from Eating Disorders. Asian students were most likely to report consequences resulting from Internet use/Computer games (22.6%), Relationship Difficulty (24.3%), and Stress (43.2%). A greater proportion of Native American students (15.6%) reported experiencing consequences resulting from the Death of a friend or family member. ADD (11.9%) and Sleep difficulty (32.5%) were mostly reported by students in the More than 1 Race category. Students who did not report a race were most likely to report consequences resulting from Concern for a friend or family member (30.0%), Depression/Anxiety/SAD (26.3%), and Learning Disability (11.1%) With the exception of Death of a friend or family member and Eating Disorders, all comparisons resulted in a statistically significant chi-square ( $p < 0.05$ ) (Table 116). The results of the Cramer's V test indicate the relationships mostly negligible. Weak effect sizes were observed for only the Concern for a friend or family member, and Internet Use/Computer games items.

**Table 115: Mental Health Consequences on Academic Performance Items “Yes” Responses: Fifth-year Students by Race**

	White	Black	Hispanic	Asian	Native Amer	Other	More than 1 Race	No Race
	N =	N =	N =	N =	N =	N =	N =	N =
	14,076	913	990	1,223	92	525	663	106
	%	%	%	%	%	%	%	%
<b>Academic Performance Affected by:</b>								
Experienced at least 1 Consequence	57.4	58.4	61.5	62.9	59.1	62.2	66.6	63.3
Attention Deficit Disorder	10.0	6.6	7.6	7.8	10.0	9.4	11.9	9.9
Concern for friend or family member	20.6	21.0	26.5	26.3	26.4	24.9	29.8	30.0
Death of friend or family member	11.3	12.8	13.1	11.8	15.6	13.2	12.9	14.1
Depression/Anxiety/SAD	20.2	15.4	21.7	20.2	17.8	23.4	21.6	26.3
Eating Disorder	1.3	1.2	1.8	1.6	0.0	1.4	1.9	0.0
Internet use/Computer games	13.3	12.8	13.7	22.6	11.2	14.7	17.9	17.2
Learning disability	5.8	3.2	4.4	4.3	5.6	8.0	7.8	11.1
Relationship difficulty	18.8	20.8	23.9	24.3	15.7	21.9	22.2	17.5
Sleep difficulty	27.3	23.8	29.5	30.2	28.1	31.9	32.5	32.3
Stress	36.6	35.1	40.5	43.2	31.1	40.5	40.4	38.1

**Table 116: Mental Health Consequences on Academic Performance Items “Yes” Responses Comparison: Fifth-year Students by Race**

	X <sup>2</sup>	p	df	Cramer's V	Effect Size Interpretation
<b>Academic Performance Affected by:</b>					
Experienced at least 1 Consequence	41.82	<.001	7	.05	Negligible
Attention Deficit Disorder	24.51	.001	7	.04	Negligible
Concern for friend or family member	70.77	<.001	7	.07	Weak
Death of friend or family member	8.77	.270	7	.02	Negligible
Depression/Anxiety/SAD	20.39	.005	7	.03	Negligible
Eating Disorder	5.24	.630	7	.02	Negligible
Internet use/Computer games	88.61	<.001	7	.07	Weak
Learning disability	34.11	<.001	7	.04	Negligible
Relationship difficulty	40.66	<.001	7	.05	Negligible
Sleep difficulty	26.28	<.001	7	.04	Negligible
Stress	33.10	<.001	7	.04	Negligible

The results for the Mental Health Consequences variables with impact on grade point average indicate that the More than 1 Race students were most likely to report that GPA was lowered as a result of ADD, Depression/Anxiety/SAD, Eating Disorder, and Stress (Table 117). The Other Race group had the highest proportion of students whose GPAs went down as a result of Relationship Difficulty and Sleep Difficulty. Internet Use/Computer games was most likely to result in lowered GPA for Asian students, while



Native Americans were most likely to be affected by Concern for friend or family member, and Death of a friend or family member. The No Race Reported group was most likely to be affected by Learning Disability. With the exception of Death of a friend or family member and Eating Disorders, all comparisons resulted in a statistically significant chi-square ( $p < 0.05$ ) (Table 118), though the results of the Cramer's V test indicate the relationships were all negligible.

**Table 117: Mental Health Consequences on Academic Performance Items Categorized “Yes” Responses: Fifth-year Students by Race**

	White	Black	Hispanic	Asian	Native Amer	Other	More than 1 Race	No Race
	N =	N =	N =	N =	N =	N =	N =	N =
	14,076	913	990	1,223	92	525	663	106
	%	%	%	%	%	%	%	%
<b>Academic Performance Affected by:</b>								
Attention Deficit Disorder								
Yes, but did not affect GPA	5.8	4.9	5.3	5.3	7.8	4.7	6.6	5.9
Yes, did affect GPA	4.2	1.7	2.3	2.4	2.2	4.7	5.2	4.0
Concern for friend or family member								
Yes, but did not affect GPA	16.3	16.1	20.8	19.4	14.3	16.5	23.7	18.0
Yes, did affect GPA	4.3	4.9	5.6	6.9	12.1	8.4	6.2	12.0
Death of friend or family member								
Yes, but did not affect GPA	8.0	7.8	9.2	7.6	7.8	9.3	9.1	8.1
Yes, did affect GPA	3.4	5.1	3.9	4.2	7.8	3.9	3.8	6.1
Depression/Anxiety/SAD								
Yes, but did not affect GPA	13.2	10.4	16.2	14.4	12.2	14.9	12.9	18.2
Yes, did affect GPA	7.0	5.1	5.4	5.8	5.6	8.5	8.7	8.1
Eating Disorder								
Yes, but did not affect GPA	0.9	1.1	1.4	1.3	0.0	1.2	1.1	0.0
Yes, did affect GPA	0.5	0.1	0.3	0.2	0.0	0.2	0.8	0.0
Internet use/Computer games								
Yes, but did not affect GPA	10.3	9.7	11.1	16.6	9.0	11.4	13.9	14.1
Yes, did affect GPA	3.0	3.0	2.7	6.0	2.2	3.3	4.0	3.0
Learning disability								
Yes, but did not affect GPA	3.3	1.6	2.5	2.9	2.2	4.1	4.5	4.0
Yes, did affect GPA	2.5	1.6	1.9	1.4	3.3	3.9	3.4	7.1
Relationship difficulty								
Yes, but did not affect GPA	14.0	14.1	18.0	16.5	13.5	14.0	15.4	15.5
Yes, did affect GPA	4.8	6.7	5.8	7.8	2.2	7.9	6.7	2.1
Sleep difficulty								
Yes, but did not affect GPA	21.3	19.1	23.8	24.1	19.1	22.2	23.1	26.3
Yes, did affect GPA	6.0	4.7	5.7	6.2	9.0	9.7	9.3	6.1
Stress								
Yes, but did not affect GPA	27.2	26.3	30.5	30.3	20.0	27.5	26.7	28.9
Yes, did affect GPA	9.4	8.8	10.0	12.9	11.1	13.0	13.7	9.3

**Table 118: Mental Health Consequences on Academic Performance Items Categorized “Yes” Responses Comparison: Fifth-year Students by Race**

	X <sup>2</sup>	p	df	Cramer’s V	Effect Size Interpretation
<b>Academic Performance Affected by:</b>					
Attention Deficit Disorder	38.28	<.001	14	.03	Negligible
Concern for friend or family member	104.71	<.001	14	.05	Negligible
Death of friend or family member	20.45	.116	14	.02	Negligible
Depression/Anxiety/SAD	35.13	.001	14	.03	Negligible
Eating Disorder	14.27	.430	14	.02	Negligible
Internet use/Computer games	93.11	<.001	14	.05	Negligible
Learning disability	41.17	<.001	14	.03	Negligible
Relationship difficulty	60.92	<.001	14	.04	Negligible
Sleep difficulty	44.12	<.001	14	.04	Negligible
Stress	52.41	<.001	14	.04	Negligible

#### A/B GPA and C/D/F GPA Fifth-year Students

Among all students, C/D/F GPA students demonstrated slightly higher frequency and quantity of consumption of alcohol (Table 119). Both groups drank alcohol 3-5 of the past 30 days ( $M=2.01, 2.11$ ). C/D/F students consumed 5.32 drinks ( $SD=4.53$ ) over 3.42 hours ( $SD=2.50$ ) to the 4.78 ( $SD=4.05$ ) drinks over 3.31 hours ( $SD=2.37$ ) consumed by A/B students. Past 2 week consumption varied little between the groups. C/D/F students consumed the same amount of alcohol as the last time they “partied” an average of 1.38 times ( $SD=1.74$ ) in the past 2 weeks, while A/B students consumed the same amount on 1.25 days ( $SD=1.65$ ) in the past 2 weeks. C/D/F students consumed five or more drinks an average of 1.38 times ( $SD=2.05$ ), compared to 1.12 times ( $SD=1.79$ ) for A/B students.

Among students who reported consuming alcohol, only a slightly higher proportion of C/D/F GPA students reported consuming alcohol on all five items than A/B GPA students: *Past 30 days use* (77.3% vs. 77.1%); *Hours of alcohol use* (85.1% vs. 84.6%); *Number of drinks consumed* (86.9% vs. 85.9%); *Number of occasions same amount of alcohol consumed in the past 2 weeks* (58.7% vs. 56.1%); and *Number of times*

*in past 2 weeks 5 or more drinks consumed* (47.4% vs. 42.3%) (Table 119). The results for the mean scores for each item were on slightly higher for the C/D/F students than A/B students (Table 119). However, mean scores were statistically different for all items. In Table 119, negative t-scores indicate greater use among C/D/F GPA students.

**Table 119: Alcohol Use Behavior Items: Fifth-year Students by Grade Point Average (A/B GPA vs. C/D/F GPA)**

	A/B N = 14,085				C/D/F N = 4,101				t-test	p
	Range	%	M	SD	%	M	SD			
<b>Alcohol Use Behaviors (all students)</b>										
Days of alcohol use during past 30 days	0-6		2.01	1.54		2.11	1.62	-3.73	<.001	
Hours of alcohol use last time "partied"	0-14		3.31	2.37		3.42	2.50	-2.47	.013	
Number of drinks last time "partied"	0-23		4.78	4.05		5.32	4.53	-6.83	<.001	
Number of times in past 2 weeks drinking same or more alcohol as last time "partied"	0-10		1.25	1.65		1.38	1.74	-4.17	<.001	
Number of times in past 2 weeks more than 5 drinks consumed	0-9		1.12	1.79		1.38	2.05	-7.33	<.001	
<b>Alcohol Use Behaviors (drinkers only)</b>										
Days of alcohol use during past 30 days	1-6	77.1	2.58	1.25	77.3	2.72	1.31	-5.29	<.001	
Hours of alcohol use last time "partied"	1-14	84.6	3.89	2.09	85.1	3.99	2.24	-2.31	.021	
Number of drinks last time "partied"	1-23	85.9	5.54	3.84	86.9	6.08	4.34	-6.76	<.001	
Number of times in past 2 weeks drinking same or more alcohol as last time "partied"	1-10	56.1	2.20	1.64	58.7	2.32	1.71	-2.93	.003	
Number of times in past 2 weeks more than 5 drinks consumed	1-9	42.4	2.63	1.88	47.3	2.90	2.10	-5.06	<.001	

Note: Due to the use of bonferroni's correction,  $p < .005$  is used to determine statistical significance  
Positive t-scores indicate greater alcohol use among A/B students; negative t-scores indicate greater use among C/D/F students

Approximately 49% of C/D/F students experienced at least one consequence of alcohol use as compared to 44.2% of A/B students (Table 120). C/D/F students were more likely to report experiencing all of the itemized alcohol-related consequences than A/B students. All comparisons resulted in a statistically significant chi-square ( $p < 0.05$ ), though the results of the Cramer's V test indicate relatively low effect sizes (Table 121). Only the academic consequence demonstrated a moderate effect size. A negligible effect size is indicated on all other consequence items.

**Table 120: Alcohol Use Consequence Items “Yes” Responses: Fifth-year Students by Grade Point Average (A/B GPA vs. C/D/F GPA)**

	A/B N = 14,085 %	C/D/F N = 4,101 %
<b>Alcohol Consequences</b>		
Experienced at least 1 Consequence	44.2	48.7
<b>Alcohol Consequences</b>		
Physical injury to self	15.9	18.2
Physical injury to another person	4.1	6.2
Been involved in a fight	6.4	9.5
Did something you later regretted	33.1	34.8
Forgot where you were or what you did	25.3	28.7
Academic performance affected by alcohol use		
Yes, but did not affect GPA	7.4	13.5
Yes, but did affect GPA	2.0	5.1

**Table 121: Alcohol Use Consequence Items “Yes” Responses Comparison: Fifth-year Students by Grade Point Average (A/B GPA vs. C/D/F GPA)**

	X <sup>2</sup>	p	df	Cramer’s V	Effect Size Interpretation
<b>Alcohol Consequences</b>					
Experienced at least 1 Consequence	24.71	<.001	1	.04	Negligible
<b>Alcohol Consequences</b>					
Physical injury to self	12.07	.001	1	.03	Negligible
Physical injury to another person	34.53	<.001	1	.04	Negligible
Been involved in a fight	47.19	<.001	1	.05	Negligible
Did something you later regretted	4.03	.045	1	.02	Negligible
Forgot where you were or what you did	18.30	<.001	1	.03	Negligible
Academic performance affected by alcohol use	266.40	<.001	2	.12	Moderate

Table 122 reports the results for the Mental Health Symptom variables that were coded as dichotomous Yes/No responses. A higher proportion of A/B students experienced only mild (14.3%) and at least moderate (73.9%) symptoms than C/D/F students (11.4%, 72.7%, respectively). C/D/F students (13.5%) were more likely to report severe symptoms, than A/B students (9.2%). By individual symptom, the proportion of students feeling overwhelmed was the same for both groups, and slightly more A/B students reported feeling exhausted. C/D/F students were more likely to report all moderate (very sad, hopeless, and depressed) and severe (suicidal, attempted suicide) symptoms than A/B students. Statistically significant chi-square ( $p < 0.05$ ) were observed

for the overall index item and all moderate and severe symptoms (Table 123). The results of the Cramer's V test indicate negligible effect sizes for the overwhelmed, exhausted, very sad, and attempted suicide items. Weak effect sizes were observed for the overall index, hopeless, depressed, and felt suicidal items.

**Table 122: Mental Health Symptoms Items “Yes” Responses: Fifth-year Students by Grade Point Average (A/B GPA vs. C/D/F GPA)**

	A/B N = 14,085	C/D/F N = 4,101
	%	%
<b>Index of Mental Health Symptoms</b>		
No Symptoms	2.6	2.5
Only Mild Symptoms	14.3	11.4
At least Moderate Symptoms	73.9	72.7
At least Severe Symptoms	9.2	13.5
<b>Mental Health Symptoms</b>		
Last year felt overwhelmed by all you had to do	94.7	94.7
Last year felt exhausted (not from physical activity)	92.6	92.0
Last year felt very sad	79.1	81.0
Last year felt things were hopeless	60.8	70.4
Last year felt so depressed it was difficult to function	43.1	50.6
Last year seriously considered attempting suicide	9.1	13.4
Last year attempted suicide	1.0	1.7

**Table 123: Mental Health Symptoms Items “Yes” Responses Comparison: Fifth-year Students by Grade Point Average (A/B GPA vs. C/D/F GPA)**

	X <sup>2</sup>	p	df	Cramer's V	Effect Size Interpretation
<b>Index of Mental Health Symptoms</b>	78.97	<.001	3	.07	Weak
<b>Mental Health Symptoms</b>					
Last year felt overwhelmed by all you had to do	.00	.980	1	.00	Negligible
Last year felt exhausted (not from physical activity)	1.67	.197	1	.01	Negligible
Last year felt very sad	7.31	.007	1	.02	Negligible
Last year felt things were hopeless	126.09	<.001	1	.08	Weak
Last year felt so depressed it was difficult to function	71.78	<.001	1	.06	Weak
Last year seriously considered attempting suicide	64.84	<.001	1	.06	Weak
Last year attempted suicide	11.08	.001	1	.03	Negligible

Among the Mental Health Symptoms variables coded as three-level ordinal frequency responses (Table 124), a slightly higher proportion of A/B students felt overwhelmed and exhausted 9 or more times in the previous school year than C/D/F

students. A/B students were more likely to report feeling very sad 1-8 times than C/D/F students. C/D/F students were more likely to report feeling very sad 9 times or more, and hopeless, depressed, and seriously considered suicide both 1-8 times and 9 times or more. More C/D/F students reported attempting suicide 1-8 times, but the proportion of students attempting suicide 9 times or more was the same for both groups. Results of the chi-square analysis are presented in Table 125. Comparisons resulted in a statistically significant chi-square ( $p < 0.05$ ) for all of the Moderate and Severe symptoms, but not the Mild symptoms. The results of the Cramer's V test indicate weak effect sizes for the feeling hopeless, depressed, and seriously considered suicide items, but negligible effect sizes for all other variables.

**Table 124: Mental Health Symptoms Items Categorized Responses: Fifth-year Students by Grade Point Average (A/B GPA vs. C/D/F GPA)**

	A/B	C/D/F
	N = 14,085	N = 4,101
	%	%
<b>Mental Health Symptoms</b>		
Last year felt overwhelmed by all you had to do		
Never	5.3	5.3
1-8 times	52.7	53.7
9 or more times	42.0	41.0
Last year felt exhausted (not from physical activity)		
Never	7.4	8.0
1-8 times	53.4	53.1
9 or more times	39.2	38.8
Last year felt very sad		
Never	20.9	19.0
1-8 times	60.1	58.0
9 or more times	19.0	23.0
Last year felt things were hopeless		
Never	39.2	29.6
1-8 times	47.9	51.3
9 or more times	12.9	19.2
Last year felt so depressed it was difficult to function		
Never	56.9	49.4
1-8 times	33.6	36.0
9 or more times	9.5	14.6

**Table 124 (continued)**

Last year seriously considered attempting suicide		
Never	90.9	86.6
1-8 times	8.0	11.8
9 or more times	1.0	1.6
Last year attempted suicide		
Never	99.0	98.3
1-8 times	1.0	1.6
9 or more times	0.1	0.1

**Table 125: Mental Health Symptoms Items Categorized Responses: Fifth-year Students by Grade Point Average (A/B GPA vs. C/D/F GPA)**

	X <sup>2</sup>	p	df	Cramer's V	Effect Size Interpretation
<b>Mental Health Symptoms</b>					
Last year felt overwhelmed by all you had to do	1.39	.499	2	.01	Negligible
Last year felt exhausted (not from physical activity)	1.68	.432	2	.01	Negligible
Last year felt very sad	34.20	<.001	2	.04	Negligible
Last year felt things were hopeless	174.89	<.001	2	.10	Weak
Last year felt so depressed it was difficult to function	114.17	<.001	2	.08	Weak
Last year seriously considered attempting suicide	64.97	<.001	2	.06	Weak
Last year attempted suicide	11.09	<.001	2	.03	Negligible

As shown in Table 126, the proportion of students that has ever been diagnosed with Depression was the same for both groups (18.5%). Of those diagnosed with Depression, C/D/F students were more likely to be diagnosed in the last year (38.3%), are currently in therapy for depression (26.6%), and are currently taking medicine for depression (35.3) than A/B students. Chi-square analysis resulted in a statistically significant ( $p < 0.05$ ) difference for the diagnosed in the last year, and currently in therapy items (Table 127). The results of the Cramer's V test indicate weak effect sizes for the diagnosed in the last year, and currently in therapy items, and negligible effect sizes on the ever diagnosed and medication items.

For the Mental Health Experience items, a higher proportion of C/D/F students experienced Anxiety (16.1%), Chronic Fatigue Syndrome (4.1%), Depression (25.0%), , and Substance Abuse (7.2%) than A/B students (Table 128). Larger proportions of A/B

students were observed only for Seasonal Affective Disorder (8.5%). The proportions were the same for Anorexia (1.3%) and Bulimia (2.1%). Chi-square analyses were statistically significant ( $p < 0.05$ ) only for Depression, Seasonal Affective Disorder, and Substance Abuse. The results of the Cramer's V test indicate negligible effect sizes for all items.

**Table 126: Depression Diagnosis, Therapy, and Medication Items: Fifth-year Students by Grade Point Average (A/B GPA vs. C/D/F GPA)**

	A/B N = 14,085 %	C/D/F N = 4,101 %
<b>Depression</b>		
Ever diagnosed with depression	18.5	18.5
	N = 2,590 %	N = 752 %
<b>Of those Diagnosed with Depression</b>		
Diagnosed with depression in the last year	29.4	38.3
Currently in therapy for depression	20.5	26.6
Currently taking medicine for depression	32.5	35.8

**Table 127: Depression Diagnosis, Therapy, and Medication Items Comparison: Fifth-year Students by Grade Point Average (A/B GPA vs. C/D/F GPA)**

	X <sup>2</sup>	p	df	Cramer's V	Effect Size Interpretation
<b>Depression</b>					
Ever diagnosed with depression	.00	.997	1	.00	Negligible
Diagnosed with depression in the last year	21.29	<.001	1	.08	Weak
Currently in therapy for depression	12.79	<.001	1	.06	Weak
Currently taking medicine for depression	2.82	.093	1	.03	Negligible

**Table 128: Experiences of Mental Health Disorders in Past Year Items "Yes" Responses: Fifth-year Students by Grade Point Average (A/B GPA vs. C/D/F GPA)**

	A/B N = 14,085 %	C/D/F N = 4,101 %
<b>Within the past year have you experienced:</b>		
Anorexia	1.3	1.3
Anxiety	15.2	16.1
Bulimia	2.1	2.1
Chronic fatigue	3.9	4.1
Depression	20.4	25.0
Seasonal Affective Disorder	8.5	7.4
Substance abuse	4.8	7.2



**Table 129: Experiences of Mental Health Disorders in Past Year Items “Yes” Responses Comparison: Fifth-year Students by Grade Point Average (A/B GPA vs. C/D/F GPA)**

	X <sup>2</sup>	p	df	Cramer’s V	Effect Size Interpretation
<b>Within the past year have you experienced:</b>					
Anorexia	.00	.988	1	.00	Negligible
Anxiety	1.91	.167	1	.01	Negligible
Bulimia	.01	.924	1	.00	Negligible
Chronic fatigue	.17	.681	1	.00	Negligible
Depression	39.10	<.001	1	.05	Negligible
Seasonal Affective Disorder	5.10	.024	1	.02	Negligible
Substance abuse	36.61	<.001	1	.05	Negligible

Table 130 reports the results for the Mental Health Diagnosis items. A/B students were more likely to be diagnosed with Anorexia, Anxiety, Bulimia, Chronic Fatigue, and Depression than C/D students. C/D students were only slightly more likely to be diagnosed with Seasonal Affective Disorder and Substance Abuse. Results of the chi-square analysis were only statistically significant ( $p < 0.05$ ) for Anorexia, Anxiety, and Bulimia (Table 131). Cramer’s V were negligible for all items.

**Table 130: Lifetime Diagnosis of Mental Health Disorders Items “Yes” Responses: Fifth-year Students by Grade Point Average (A/B GPA vs. C/D/F GPA)**

	A/B N = 14,085	C/D/F N = 4,101
	%	%
<b>Have you ever been diagnosed with:</b>		
Anorexia	2.6	1.6
Anxiety	10.7	9.6
Bulimia	2.4	1.8
Chronic fatigue	1.5	1.2
Depression	17.7	17.1
Seasonal Affective Disorder	2.9	3.0
Substance abuse	2.7	2.8

**Table 131: Lifetime Diagnosis of Mental Health Disorders Items “Yes” Responses Comparison: Fifth-year Students by Grade Point Average (A/B GPA vs. C/D/F GPA)**

	X <sup>2</sup>	p	df	Cramer’s V	Effect Size Interpretation
<b>Have you ever been diagnosed with:</b>					
Anorexia	12.30	<.001	1	.03	Negligible
Anxiety	3.88	.049	1	.02	Negligible
Bulimia	5.58	.018	1	.02	Negligible
Chronic fatigue	2.33	.127	1	.01	Negligible
Depression	.769	.380	1	.01	Negligible
Seasonal Affective Disorder	.043	.835	1	.00	Negligible
Substance abuse	.014	.905	1	.00	Negligible

Across the Mental Health Status variables, 41.3% of C/D/F students report at least one experience or diagnosis, compared to 39.8% of A/B students (Table 132). A higher proportion of C/D/F students reported being most at-risk (Yes experience/No diagnosis) across all items, except for Seasonal Affective Disorder. The largest group differences were observed for Depression and Substance Abuse. Statistically significant chi-square values ( $p < 0.05$ ) were observed for Anorexia, Bulimia, Depression, and Substance Abuse (Table 132). The results of the Cramer’s V test indicate a weak effect sizes for Depression, and negligible effect sizes for all other variables.

**Table 132: Status of Mental Health Disorders in Past Year: Fifth-year Students by Grade Point Average (A/B GPA vs. C/D/F GPA)**

	A/B N = 14,085 %	C/D/F N = 4,101 %
<b>Overall Status</b>		
At least 1 Experience or Diagnosis	39.8	41.3
<b>Disorder</b>		
<b>Anorexia</b>		
No Experiences/No Diagnosis	96.6	97.5
No Experiences/Yes Diagnosis	2.0	1.1
Yes Experiences/Yes Diagnosis	0.5	0.4
Yes Experiences/No Diagnosis	0.8	0.9
<b>Anxiety</b>		
No Experiences/No Diagnosis	82.3	82.3
No Experiences/Yes Diagnosis	2.4	1.5
Yes Experiences/Yes Diagnosis	8.3	8.1
Yes Experiences/No Diagnosis	7.0	8.0

**Table 132 (continued)**

Bulimia		
No Experiences/No Diagnosis	96.4	96.8
No Experiences/Yes Diagnosis	1.5	1.0
Yes Experiences/Yes Diagnosis	0.9	0.8
Yes Experiences/No Diagnosis	1.3	1.4
Chronic fatigue		
No Experiences/No Diagnosis	95.6	95.7
No Experiences/Yes Diagnosis	0.4	0.3
Yes Experiences/Yes Diagnosis	1.1	0.9
Yes Experiences/No Diagnosis	2.9	3.2
Depression		
No Experiences/No Diagnosis	73.1	70.4
No Experiences/Yes Diagnosis	6.4	4.4
Yes Experiences/Yes Diagnosis	11.4	12.8
Yes Experiences/No Diagnosis	9.2	12.4
Seasonal Affective Disorder		
No Experiences/No Diagnosis	90.9	91.9
No Experiences/Yes Diagnosis	0.6	0.6
Yes Experiences/Yes Diagnosis	2.3	2.3
Yes Experiences/No Diagnosis	6.2	5.2
Substance abuse		
No Experiences/No Diagnosis	93.6	91.5
No Experiences/Yes Diagnosis	1.5	1.2
Yes Experiences/Yes Diagnosis	1.1	1.5
Yes Experiences/No Diagnosis	3.7	5.8

**Table 133: Status of Mental Health Disorders in Past Year Comparison: Fifth-year Students by Grade Point Average (A/B GPA vs. C/D/F GPA)**

	X <sup>2</sup>	p	df	Cramer's V	Effect Size Interpretation
<b>Overall Status</b>	2.99	.084	1	.01	Negligible
<b>Disorder:</b>					
Anorexia	14.72	.002	3	.03	Negligible
Anxiety	16.73	.001	3	.03	Negligible
Bulimia	7.00	.072	3	.02	Negligible
Chronic fatigue	3.39	.335	3	.01	Negligible
Depression	58.78	<.001	3	.06	Weak
Seasonal Affective Disorder	5.95	.114	3	.02	Negligible
Substance abuse	38.90	<.001	3	.05	Negligible

As shown in Table 134, 71.7% of C/D/F students experienced at least one mental health related consequence as compared to 54.7% of A/B students. C/D/F students were also more likely to report experiencing all of the itemized consequences than A/B students. All comparisons resulted in a statistically significant chi-square ( $p < 0.05$ ) (Table 135). The results of the Cramer's V test indicate a strong effect size for the overall consequence item, and moderate effect sizes for Learning Disability, Relationship

difficulties, Sleep Difficulty, and Stress items. Weak effect sizes were observed on Concern for another, Death of friend or family member, Depression, and Internet use/Computer Games. Effect sizes for ADD and Eating Disorders were negligible.

**Table 134: Mental Health Consequences on Academic Performance Items “Yes” Responses: Fifth-year Students by Grade Point Average (A/B GPA vs. C/D/F GPA)**

	A/B N = 14,085	C/D/F N = 4,101
	%	%
<b>Academic Performance Affected by:</b>		
Experienced at least 1 Consequence	54.7	71.7
Attention Deficit Disorder	7.5	16.6
Concern for friend or family member	19.7	29.2
Death of friend or family member	10.3	16.5
Depression/Anxiety/SAD	18.3	27.1
Eating Disorder	1.2	1.9
Internet use/Computer games	12.2	20.9
Learning disability	4.3	10.5
Relationship difficulty	17.5	27.5
Sleep difficulty	24.8	38.1
Stress	34.3	48.6

**Table 135: Mental Health Consequences on Academic Performance Items “Yes” Responses Comparison: Fifth-year Students by Grade Point Average (A/B GPA vs. C/D/F GPA)**

	X <sup>2</sup>	p	df	Cramer’s V	Effect Size Interpretation
<b>Academic Performance Affected by:</b>					
Experienced at least 1 Consequence	370.65	<.001	1	.15	Strong
Attention Deficit Disorder	296.04	<.001	1	.13	Negligible
Concern for friend or family member	164.40	<.001	1	.10	Weak
Death of friend or family member	118.46	<.001	1	.08	Weak
Depression/Anxiety/SAD	150.16	<.001	1	.09	Weak
Eating Disorder	10.60	.001	1	.02	Negligible
Internet use/Computer games	194.47	<.001	1	.10	Weak
Learning disability	224.73	<.001	1	.11	Moderate
Relationship difficulty	197.24	<.001	1	.11	Moderate
Sleep difficulty	277.44	<.001	1	.12	Moderate
Stress	271.77	<.001	1	.12	Moderate

Results for the Mental Health Consequences variables expanded to report the impact of the consequence on grade point average are shown in Table 136. The results mirror those of the previous table with a greater proportion of C/D/F students reporting

experiencing a lowered GPA as a result of all of the itemized consequences than A/B students. C/D/F students also were more likely to experience consequences that did not lower their GPA. All comparisons resulted in a statistically significant chi-square ( $p < 0.05$ ) (Table 137), though the results of the Cramer's V test indicate the relationships were generally weak or negligible. Only Internet use/Computer games resulted in a strong effect size.

**Table 136: Mental Health Consequences on Academic Performance Items Categorized “Yes” Responses: Fifth-year Students by Grade Point Average (A/B GPA vs. C/D/F GPA)**

	A/B N = 14,085	C/D/F N = 4,101
	%	%
<b>Academic Performance Affected by:</b>		
Attention Deficit Disorder		
Yes, but did not affect GPA	4.8	8.9
Yes, did affect GPA	2.7	7.7
Concern for friend or family member		
Yes, but did not affect GPA	15.8	21.0
Yes, did affect GPA	3.9	8.2
Death of friend or family member		
Yes, but did not affect GPA	7.3	10.8
Yes, did affect GPA	3.0	5.8
Depression/Anxiety/SAD		
Yes, but did not affect GPA	12.5	16.5
Yes, did affect GPA	5.8	10.6
Eating Disorder		
Yes, but did not affect GPA	0.9	1.2
Yes, did affect GPA	0.3	0.7
Internet use/Computer games		
Yes, but did not affect GPA	9.8	14.9
Yes, did affect GPA	2.4	6.0
Learning disability		
Yes, but did not affect GPA	2.6	5.5
Yes, did affect GPA	1.7	5.0
Relationship difficulty		
Yes, but did not affect GPA	13.3	18.7
Yes, did affect GPA	4.2	8.9
Sleep difficulty		
Yes, but did not affect GPA	20.0	27.3
Yes, did affect GPA	4.8	10.8
Stress		
Yes, but did not affect GPA	26.3	32.2
Yes, did affect GPA	8.0	16.4

**Table 137: Mental Health Consequences on Academic Performance Items Categorized “Yes” Responses Comparison: Fifth-year Students by Grade Point Average (A/B GPA vs. C/D/F GPA)**

	X <sup>2</sup>	p	df	Cramer's V	Effect Size Interpretation
<b>Academic Performance Affected by:</b>					
Attention Deficit Disorder	318.13	<.001	2	.08	Weak
Concern for friend or family member	203.52	<.001	2	.09	Weak
Death of friend or family member	127.74	<.001	2	.06	Weak
Depression/Anxiety/SAD	172.18	<.001	2	.09	Weak
Eating Disorder	15.06	.001	2	.05	Negligible
Internet use/Computer games	226.34	<.001	2	.18	Strong
Learning disability	234.10	<.001	2	.01	Negligible
Relationship difficulty	228.35	<.001	2	.03	Negligible
Sleep difficulty	336.96	<.001	2	.02	Negligible
Stress	361.82	<.001	2	.09	Weak

### Summary

The second hypothesis of this study was: Males, Whites, and those with C/D/F grade point averages are more likely to consume more alcohol and experience more mental health issues than their respective counterparts (females, minorities, and A/B average students). In general the results provide little evidence to support the hypothesis with respect to males and White students. Males were only more likely than females to consume more alcohol and report more alcohol-related consequences. Whites were only more likely than other races to consume more alcohol and to have been diagnosed with Depression and Anorexia.

In terms of C/D/F students, ample evidence supported the hypothesis. C/D/F students consumed more alcohol and were more likely to experience alcohol-related consequences than A/B students and to experience Moderate and Severe Mental Health Symptoms. They were less likely to be diagnosed with and be treated for Depression, but more likely to experience mental health disorders without a diagnosis, as measured by the Mental Health Status variable. They also were more likely to report mental health-related consequences to academic performance, regardless of effect on GPA.

## CHAPTER 6: RESULTS- LOGISTIC REGRESSION & SEM

This chapter presents the results of the logistic regression analyses and structural equation modeling.

### Logistic Regression: 5<sup>th</sup>-year Student GPA, and Alcohol and Mental Health

To determine the relative impact of the Alcohol and Mental Health variables on 5<sup>th</sup>-year student GPA, logistic regression analyses were conducted. The model controlled for Age, Sex, Race, International Student Status, Sexual Preference, Fraternity/Sorority Membership, Living Situation, Relationship Status, Health Insurance Status, Number of Hours Worked per week, and Number of Hours Volunteered per week. The results (Table 138) indicate that significant predictors of C/D/F GPA in 5<sup>th</sup>-year students were: hours of alcohol use, number of drinks, doing something later regretted as a result of alcohol use, academic performance affected by alcohol use, feeling exhausted, feeling hopeless, Anxiety, Chronic Fatigue, Depression, Seasonal Affective Disorder, Substance Abuse, ADD, Concern for friend or family member, Death of a friend or family member, Internet use/Computer games, Learning Disability, Sleep difficulty, and stress. Only statistically significant predictors are described below, unless otherwise noted.

**Alcohol Use:** For every hour of alcohol use, students were 4% *less* likely to have a C/D/F GPA. However, for every drink they consumed, students were 3% *more* likely to have a C/D/F GPA. Students who did something they later regretted as a result of alcohol use were 21% *less* likely to have a C/D/F GPA. Students who reported an

academic performance affected by alcohol use that did not lower GPA were 63% *more* likely to have a C/D/F GPA. Students whose GPA was affected by alcohol use were 79% *more* likely to have a C/D/F GPA.

Mental Health Symptoms: students who felt exhausted 1-8 times were 22% *less* likely than those who never felt exhausted to have a C/D/F GPA, while those who felt exhausted 9 times or more were 33% *less* likely to have a C/D/F GPA. Conversely, students who felt hopeless 1-8 times were 40% more likely to have a C/D/F GPA than students who never felt hopeless. Those that felt hopeless 9 times or more were 88% more likely to have a C/D/F GPA than those who never felt hopeless. Additionally, students who felt depressed 9 or more time were 21% more likely to have a C/D/F GPA than those that never felt depressed; however this was not statistically significant. Students who attempted suicide 1-8 times also were associated with increased risk (21%) of C/D/F GPA than students who never attempted suicide. This finding was not statistically significant.

Mental Health Status: Relative to students had not experienced Anxiety in the past year or had a lifetime diagnosis of Anxiety; students with no past year experience, but a past diagnosis were 44% less likely to have a C/D/F GPA. Students who had experienced Anxiety in the past year, but had never been diagnosed with Anxiety were 30% less likely to have a C/D/F GPA. Students who had experienced Chronic Fatigue Syndrome in the past year, but had never been diagnosed were 28% less likely to have a C/D/F GPA than students who had no experience and no diagnosis of Chronic Fatigue Syndrome. Students who had no experience with Depression in the past year, but had been diagnosed in the past were 20% less likely to have a C/D/F GPA than students with no experience or



diagnosis of Depression. Students who experienced Depression but had not been diagnosed were slightly more at-risk (3%) than those who had no experience or diagnosis of Depression; however this was not statistically significant. Students who experienced Seasonal Affective Disorder in the past year, but had never been diagnosed were 37% less likely to have a C/D/F GPA than students who had never experienced or been diagnosed with Seasonal Affective Disorder. Additionally, students who had no experiences of Substance Abuse in the past year, but had been diagnosed in the past were 34% less likely to have C/D/F GPAs compared to students with no experiences or diagnosis of Substance Abuse. Students with a past year experience, but no diagnosis of Substance Abuse were 7% more likely to have a C/D/F GPA, but this finding was not statistically significant.

**Mental Health Consequences:** Students who experienced academic consequences as a result of ADD were 44% more likely to have a C/D/F GPA if it did not affect GPA and 93% more likely if it did. Those who experienced a lowered GPA as a result of Concern for a friend or family member were 28% more likely to have a C/D/F GPA. Academic consequences from the Death of a friend or family member also significantly predicted C/D/F GPA. Risks increased by 21% if it did not affect GPA, and 50% if it did. Internet use/Computer games increased the risk of C/D/F GPA by 45% if it affected GPA. Learning disability also increased the risk of C/D/F GPA by 58% and 74% if it did not, and did affect GPA, respectively. Students experiencing academic consequences due to Sleep difficulty that did not lower GPA were 14% more likely to have a C/D/F GPA and 44% more likely if it did affect GPA. Those with stress-related consequences also were at increased risk. Risk increased 27% if it did not affect GPA and 65% if it did.

The following issues increased the risk of C/D/F GPA, but were not statistically significant. Depression increased the risk by 6% and 16% if it did not and did affect GPA, respectively. Academic consequences due to Eating Disorders also increased the risk of C/D/F GPA by 80% if it had an impact on GPA. Internet use/Computer games increased risk by 14% if it did not affect GPA. The final predictor of increased risk was Relationship difficulties. Students who reported academic consequences due to Relationship difficulties that did not affect GPA were 11% more likely to have a C/D/F GPA. Those whose GPA was affected were 16% more likely to have a C/D/F GPA.

**Table 138: Regression Analysis Results**

Variables	Odds Ratio	95% Confidence Intervals	
		Lower	Upper
<b>Control Variables</b>			
Age	1.07	1.03	1.11
Sex	.78	.71	.86
Race	1.13	1.10	1.16
Sexual Preference	.97	.90	1.06
International Student Status	2.67	1.75	4.08
Current Relationship	.94	.90	.98
Living Situation	.98	.94	1.02
Greek Membership Status	.85	.74	.97
Weekly Work Hours	1.09	1.06	1.12
Weekly Volunteer Hours	.79	.74	.84
Health Insurance Status	1.20	1.10	1.30
<b>Alcohol Use</b>			
Days of alcohol use during past 30 days	.99	.96	1.03
Hours of alcohol use last time "partied"	<b>.96</b>	.93	.99
Number of drinks last time "partied"	<b>1.03</b>	1.01	1.05
Number of times in past 2 weeks drinking same or more	1.00	.96	1.03
Number of times in past 2 weeks more than 5 drinks	1.02	.98	1.06
<b>Consequence of Alcohol Use</b>			
Physical Injury to Self	.95	.82	1.09
Physical injury to another person	1.04	.83	1.30
Been involved in a fight	1.10	.92	1.33
Did something you later regretted	<b>.79</b>	.71	.88
Forgot where you were or what you did	1.03	.91	1.16
<b>Academic performance affected by alcohol use</b>			
Yes, but did not affect GPA	<b>1.63</b>	1.41	1.89
Yes, did affect GPA	<b>1.79</b>	1.41	2.29
<b>Mental Health Symptoms</b>			
Last Year Felt Overwhelmed 1-8 times	1.02	.82	1.27
Last Year Felt Overwhelmed 9 times or more	.81	.63	1.03
Last Year Felt Exhausted 1-8 times	<b>.78</b>	.65	.93
Last Year Felt Exhausted 9 times or more	<b>.67</b>	.54	.82
Last Year Felt Very Sad 1-8 times	.96	.84	1.09

**Table 138 (continued)**

Last Year Felt Very Sad 9 times or more	.83	.67	1.02
Last Year Felt Hopeless 1-8 times	<b>1.40</b>	1.25	1.57
Last Year Felt Hopeless 9 times or more	<b>1.88</b>	1.55	2.27
Last Year Felt Depressed 1-8 times	.97	.86	1.09
Last Year Felt Depressed 9 times or more	1.21	.97	1.51
Last Year Felt Suicidal 1-8 times	1.07	.91	1.25
Last Year Felt Suicidal 9 times or more	1.08	.71	1.64
Last Year Attempted Suicide 1-8 times	1.21	.81	1.81
Last Year Attempted Suicide 9 times or more	.94	.13	6.79
Status of Mental Health Disorders			
Anorexia: No Experience/Yes Diagnosis	.73	.49	1.11
Anorexia: Yes Experience/Yes Diagnosis	.64	.32	1.28
Anorexia: Yes Experience/No Diagnosis	.67	.40	1.13
Anxiety: No Experience/Yes Diagnosis	<b>.56</b>	.39	.80
Anxiety: Yes Experience/Yes Diagnosis	<b>.70</b>	.58	.85
Anxiety: Yes Experience/No Diagnosis	<b>.81</b>	.68	.97
Bulimia: No Experience/Yes Diagnosis	.78	.50	1.23
Bulimia: Yes Experience/Yes Diagnosis	1.14	.66	1.97
Bulimia: Yes Experience/No Diagnosis	1.13	.76	1.68
Chronic Fatigue: No Experience/Yes Diagnosis	.90	.42	1.94
Chronic Fatigue: Yes Experience/Yes Diagnosis	.86	.56	1.33
Chronic Fatigue: Yes Experience/No Diagnosis	<b>.72</b>	.55	.94
Depression: No Experience/Yes Diagnosis	<b>.80</b>	.65	.99
Depression: Yes Experience/Yes Diagnosis	.97	.81	1.16
Depression: Yes Experience/No Diagnosis	1.03	.88	1.21
Seasonal Aff. Disorder: No Experience/Yes Diagnosis	.86	.47	1.58
Seasonal Aff. Disorder: Yes Experience/Yes Diagnosis	.78	.57	1.05
Seasonal Aff. Disorder: Yes Experience/No Diagnosis	<b>.63</b>	.51	.77
Substance Abuse: No Experience/Yes Diagnosis	<b>.66</b>	.44	.98
Substance Abuse: Yes Experience/Yes Diagnosis	.91	.61	1.35
Substance Abuse: Yes Experience/No Diagnosis	1.07	.87	1.32
Mental Health Consequences			
ADD: Yes, but did not affect GPA	<b>1.44</b>	1.21	1.72
ADD: Yes, did affect GPA	<b>1.93</b>	1.56	2.39
Concern for friend or family: Yes, but did not affect GPA	1.06	.94	1.20
Concern for friend or family: Yes, did affect GPA	<b>1.28</b>	1.05	1.55
Death of friend or family: Yes, but did not affect GPA	<b>1.21</b>	1.04	1.41
Death of friend or family: Yes, did affect GPA	<b>1.50</b>	1.21	1.85
Depression: Yes, but did not affect GPA	1.06	.91	1.23
Depression: Yes, did affect GPA	1.16	.95	1.40
Eating Disorder: Yes, but did not affect GPA	.99	.63	1.55
Eating Disorder: Yes, did affect GPA	1.80	.97	3.33
Internet Use/Computer Game: Yes, but did not affect GPA	1.14	1.00	1.30
Internet Use/Computer Game: Yes, did affect GPA	<b>1.45</b>	1.18	1.79
Learning Disability: Yes, but did not affect GPA	<b>1.58</b>	1.26	1.98
Learning Disability: Yes, did affect GPA	<b>1.74</b>	1.34	2.26
Relationship Difficulty: Yes, but did not affect GPA	1.11	.98	1.26
Relationship Difficulty: Yes, did affect GPA	1.16	.97	1.40
Sleep Difficulty: Yes, but did not affect GPA	<b>1.14</b>	1.01	1.29
Sleep Difficulty: Yes, did affect GPA	<b>1.44</b>	1.20	1.74
Stress: Yes, but did not affect GPA	<b>1.27</b>	1.13	1.43
Stress: Yes, did affect GPA	<b>1.65</b>	1.39	1.96

Note: The odds ratios represent the difference in the likelihood of being in the C/D/F GPA group vs. the A/B GPA group. Confidence intervals that pass through 1.00 are not significant.

SEM: 5<sup>th</sup>-year Student GPA, and Alcohol and Mental Health

Because ADF estimation does not allow for missing data, cases with missing values were deleted from the data set. Deleted cases (n=3140) represented approximately 17% of the dataset. The model contained 580 *df*, indicating that the model was overidentified. In examining the full model results, standardized factor loadings ranged from .126 - .929, indicating low to very high relationships between the observed and latent variables. Correlations between the latent variables were calculated within the Alcohol and Mental Health variables, as well as between groups. The correlation between Alcohol Use and Alcohol Consequences was .668, indicating a strong relationship. Strong relationships were also observed between Mental Health Symptoms and Mental Health Status (.628), Mental Health Symptoms and Mental Health Consequences (.569), and Mental Health Status and Mental Health Consequences (.545). Correlations between Alcohol and Mental Health variables were much weaker (.035 - .206). Overall, only Mental Health Status and Mental Health consequences were significant predictors of C/D/F GPA in 5<sup>th</sup>-year students.

The chi-square value was 10,349.81 (580, n=15,448),  $p = 0.00$ , CMIN/DF = 17.85,  $p = 0.00$ , though the large sample size made the significant chi-square value expected. The results of the other goodness of fit indices were as follows: RMSEA = 0.033 (90% CI = 0.032 – 0.034); and CFI = 0.654.

### Summary

The third hypothesis of this study was that 5<sup>th</sup>-year students with C/D grade point averages are more at risk for problematic alcohol use and mental health issues than 5<sup>th</sup>-year students with A/B grade point averages. The results of the logistic regression

analysis provide some evidence to support this hypothesis. While not observed for every item, among the alcohol use items, increased risk with the number of drinks, and decreased risk with the hours of alcohol use was indicated. This combination of increased drinks and decreased hours is indicative of binge or heavy drinking behavior (more drinks in less time). Though not all statistically significant, among the Mental Health items, increased risk also was observed for feeling hopeless, depressed, and suicidal, as well as experiences of Bulimia, depression, and Substance Abuse. The Mental Health Consequences variables also indicate increased risk of C/D/F GPA, whether or not the consequence directly resulted in a lowered GPA.

In testing the model using SEM, using the  $RMSEA \leq 0.06$  and  $CFI \geq 0.95$  thresholds, the analysis indicates mixed goodness-of-fit results. According to the RMSEA value, the model is a good fit to the data, however the CFI indicate that it is not. The model indicates strong relationships between the two Alcohol variables, and between the three Mental Health variables, but not the interaction between.

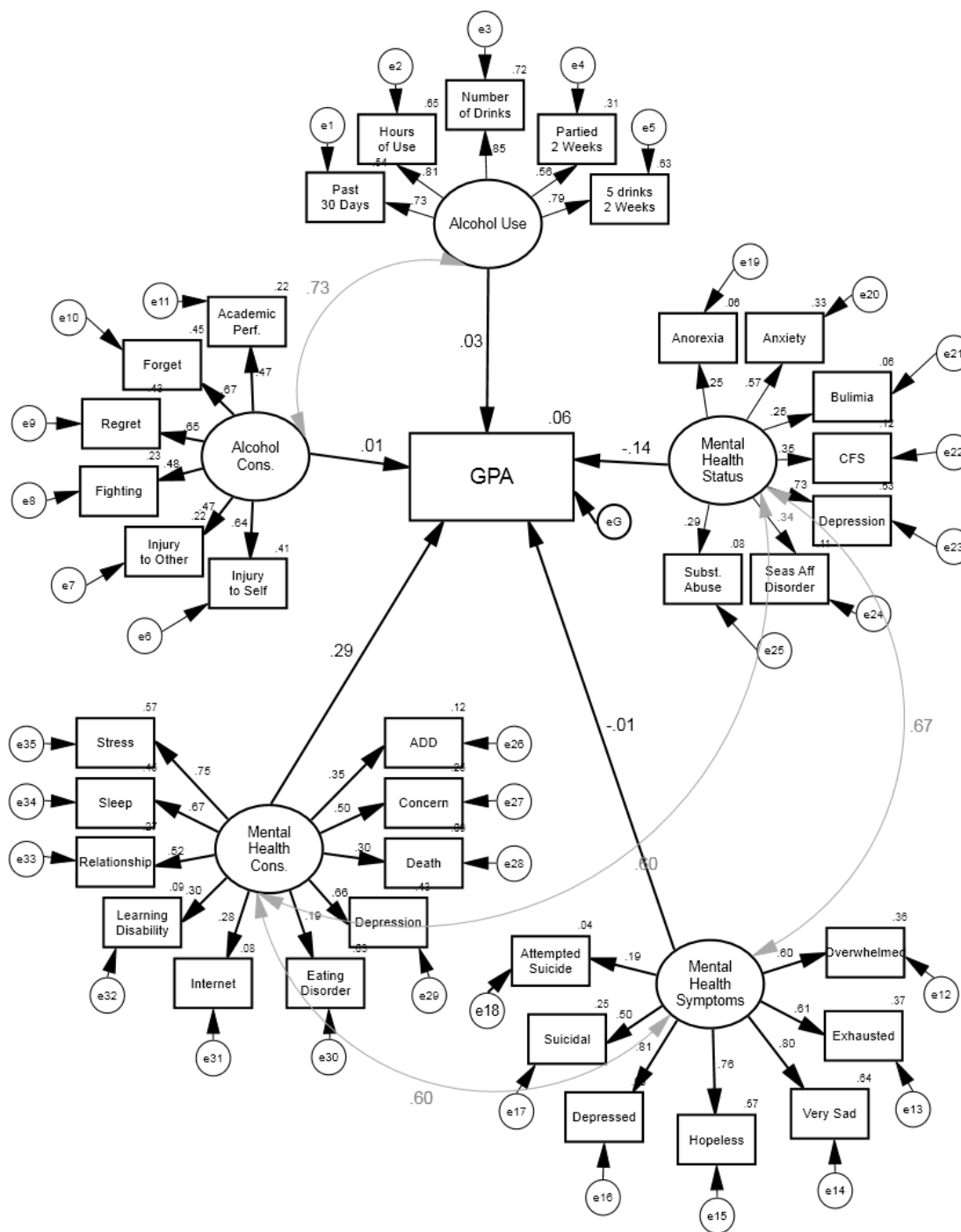


Figure 6: Structural Equation Model

## CHAPTER 7: DISCUSSION

The purpose of this study was to develop a profile of at-risk 5<sup>th</sup>-year students by assessing the relationships between alcohol use and mental health issues on academic performance in 5<sup>th</sup>-year students. Both alcohol use and mental health issues are of concern to college and university administrators and health professionals, but often are assessed separately. This study provides another view of these issues by including both of them as factors in academic performance using several years' worth of nationally representative data. Previous studies have focused on 1<sup>st</sup>-year students or underage college students. This study was unique in that it was the first to focus on 5<sup>th</sup>-year college students. Studies that have included older students or upperclassmen often lumped them together as a group without recognizing possible differences in college student groups based on the number of years in school. To that end, this study explored a growing population that has slipped largely through the cracks of the public health, mental health, and health services literature.

### Year-in-School Comparisons

Since no previously existing health “picture” of 5<sup>th</sup>-year college students existed, the first step in this process was to compare 5<sup>th</sup>-year students to other classes of students to determine whether or not they displayed characteristics distinct from other year-in-school groups. Four pair-wise comparisons were conducted to explore whether or not 5<sup>th</sup>-year students differed from other year-in-school groups. Overall, full-time 5<sup>th</sup>-year

students account for 5% of the college student population between the ages of 18 and 26. While females still account for more than half of all college students, the proportion of males is higher in 5<sup>th</sup>-year students (42%) than other students (35%). They are less likely to be members of fraternities and sororities, and more likely to live off-campus or with parents than in on-campus housing. In terms of academic performance, 5<sup>th</sup>-year students are more likely to have a grade point average skewed towards C than other year-in-school groups. They are more likely to be married or in committed relationships and to work more than 20 hours per week.

Alcohol Use: Although the data are not longitudinal, but instead a series of cross-sectional surveys, the data do permit graphing of secular trends. In comparing alcohol use across all five year-in-school groups perhaps the most noteworthy finding was the steady increase in the proportion of students engaging in various alcohol use behaviors as they progress through school. The proportion of drinkers was lowest among 1<sup>st</sup>-year students (35-70%) and highest among 4<sup>th</sup>- and 5<sup>th</sup>- year students (45-87%). These findings are slightly lower than the current literature,<sup>2, 10-12</sup> particularly the decrease in binge drinkers.<sup>11</sup> The proportion of students using alcohol during the previous 30 days and having at least one “party” episode in the past 2 weeks declined slightly between the fourth and fifth year in school, but was still higher than other groups. These findings are consistent with the current literature.<sup>85-88</sup>

The proportion of users per year in school should be assessed in conjunction with actual use behaviors. The average hours of alcohol use increased steadily from the first to fifth year in school while the number of drinks per occasion decreased from the first to fourth year, then rising again for 5<sup>th</sup>-year students. Past 30-day and 2-week use remained



steady. Although the overall trend (decreased number of drinks and increased hours) indicates a shift towards safer drinking behavior, the average amount of alcohol consumed, as analyzed by year in school, was between five and six drinks per occasion, which meets the criteria for binge drinking behavior.<sup>5</sup> Combining this data with the proportion of use per year-in-school suggests that the proportion of binge drinkers steadily increases during the progression through college. This evidence supports recent literature<sup>85-88</sup> that also found increased binge drinking behavior among seniors and upperclassmen.

What may account for this increase cannot be immediately established from this dataset. Current prevention efforts are aimed primarily at incoming students. Thus, the alcohol use patterns observed here may be related to the success of those prevention efforts. The success seen in 1<sup>st</sup>-year students may wear off as students progress through school, particularly as they become able to drink legally and the legal consequence obstacle is removed. Although binge drinking is a dangerous behavior at any age, consumption laws do not discern between amounts of alcohol consumed, instead focusing on the public disruption or danger associated with alcohol consumption. Legal age adults may consume three drinks and be arrested for driving while intoxicated if those three drinks raise their BAC to above .08, but the same legal age adults can consume 12 drinks in the privacy of their home without legal consequence. The minimized threat of legal consequences may increase drinking behavior throughout the college experience.

Increased drinking behavior also may be related to reasons for alcohol use. Several studies relate drinking in college seniors with drinking to cope<sup>84</sup> as opposed to peer pressure, which is most often associated with drinking among younger students.

Results of the mental health consequences analysis revealed that 5<sup>th</sup>-year students were more likely to experience stress-related academic consequences than other year-in-school groups, contrary to previous literature which reported decreased stress among seniors as compared to lowerclassmen.<sup>96, 97</sup> They also work more hours per week,<sup>72, 73, 78</sup> which implies that they may have more responsibilities outside of schoolwork. Stress also may be related to living situation, such as the need for financial self-sufficiency (possibly related to the increase in work hours). Those who live with parents may be dealing with a return to financial dependence, as opposed to younger students who have not yet left their parents' security.

Other research into reasons for drinking support the peer pressure<sup>80, 90, 110</sup> and sensation seeking<sup>86</sup> theories even among senior and upperclass students. Traditionally both peer pressure and sensation seeking have been associated with incoming students,<sup>84</sup> but more recent literature points to a shift in behaviors. Upperclass students were thought to “mature out” of drinking risky alcohol use behavior,<sup>84</sup> but that no longer may be the case.

The transition through college is generally thought of as an important developmental stage in the transition to adulthood. Arnett<sup>111-113</sup> calls this transition phase “Emerging Adulthood.” While not necessarily bound by age, emerging adulthood commonly takes place between ages 18-25, which coincides with the general age group of college students. According to Arnett, recent societal shifts, including increases in median ages of marriage and first child and in educational attainment, have resulted in this developmental period that is marked by high levels of freedom, independence, and instability. Emerging adulthood begins with becoming semi-independent from family,

most notably moving from the family household, and can be tracked through the achievement of various role transitions or events that signify an end of one facet of life and the beginning of another, such as finishing one's education, gaining full-time employment, settling into a career, marriage, and having children.<sup>111-113</sup>

The alcohol-related findings in this study are contrary to Arnett's theory which suggests that as students move through college and emerging adulthood criteria, their engagement in health-risk behaviors would decrease. While many aspects of college such as increased personal and academic responsibilities may encourage or even force students through emerging adulthood, other aspects may not. For example, some things become legal as students age, such as drinking alcohol. Students over the age of 21 who engage in binge drinking behavior are still in compliance with the law. Their emerging adulthood "status" has changed, although their behavior has not. Stalling in one aspect of emerging adulthood is likely related to stalling in one or more other criteria. Completion of education, one of Arnett's other criteria, stalls as students remain in school past the traditional four years.

Another study<sup>91</sup> found that alcohol-related values established during sophomore year carried over to predict senior-year alcohol behavior. In examining alcohol use across year in school, hours of alcohol use at Year 2 are higher than Year 1, but remain steady until an increase at Year 5. Number of drinks at Year 2 was higher than Year 3 and 4, but about the same as Year 5.

**Mental Health:** Overall, 40% of 5<sup>th</sup>-year students had at least one experience or diagnosis of a mental health disorder, the highest rate of any year-in-school group. The overall range of 30-40% from 1<sup>st</sup>- to 5<sup>th</sup>-year is consistent with estimates that one-third of

all college students report any sort of mental health issue<sup>51</sup> though it does highlight an increase over time that is not currently captured in the literature. Also consistent with the literature,<sup>49</sup> Depression is the most common diagnosis, though the rates ranged from 10-18.5% slightly lower than the 25% prevalence reported in the literature.<sup>49, 51, 52</sup> This lower finding may highlight that much research is based on students who seek treatment, and not the general student population. Contrary to the literature,<sup>96</sup> 5<sup>th</sup>-year students were more likely to be diagnosed with Depression than all other students. Depression diagnosis increased steadily with year-in-school, though this finding may simply be a function of time.

Because the literature may exclude students who experience symptoms of mental health without a clinical diagnosis this study utilized a series of questions from the NCHA-I that assessed mild (feeling overwhelmed or exhausted), moderate (feeling very sad, hopeless, or depressed), and severe (feeling suicidal or attempted suicide) symptoms. Almost all students reported mild symptoms. Approximately 75% of students reported at least moderate symptoms and 10% of students reported severe symptoms. All measures remained steady across groups although the proportion of students experiencing moderate symptoms was lowest among 5<sup>th</sup>-year students. Severe symptoms were lowest among 4<sup>th</sup>-year students; rates of 5<sup>th</sup>-year students were similar to 1<sup>st</sup>- through 3<sup>rd</sup>-year students. These findings are not supported in the literature which found that suicide rates are highest among college seniors.<sup>100</sup>

Assessment of mental health symptomology is important because many students may think that symptoms are a normal part of the college experience and may not seek treatment.<sup>64</sup> While feeling exhausted or overwhelmed may be a normal part of the

college experience, moderate or severe symptoms may have increased negative consequences. Fifth-year students were more likely than 1<sup>st</sup>-, 3<sup>rd</sup>-, and 4<sup>th</sup>-year students to experience at least one mental health consequence, but about the same as 2<sup>nd</sup>-year students.

Summary: The first specific aim of this study was to establish whether or not 5<sup>th</sup>-year students were a distinct group from 1<sup>st</sup>- through 4<sup>th</sup>-year students. Fifth-year students are largely missing from the public health, mental health, and health services literature. Because a great deal of research focuses on adjustment associated with the transition from high school to college, much of the literature focuses on 1<sup>st</sup>- and 2<sup>nd</sup>-year as older students are believed to have adjusted.<sup>101</sup> Traditional views of college student drinking trajectories point to students “maturing out” of heavy and problematic drinking behaviors as they progress through college.<sup>102, 103</sup> As such, these 5<sup>th</sup>-year students would be considered least at-risk for alcohol-related issues. In other studies, 5<sup>th</sup>-year students may have been captured as college seniors, given that “Senior” is a label applied to students with a minimum number of credits, making it impossible to tease out possible year-in-school differences. Overall, the results of the year-in-school analyses support the assertion that 5<sup>th</sup>-year students are a distinct group, particularly as a separate group from 4<sup>th</sup>-year students with whom they may often be combined. Though preliminary, these results suggest that they may be more similar to 2<sup>nd</sup>-year students and have stalled as sophomores.

#### Fifth-year Students: Comparison of Males and Females

The second step in establishing the “picture” of alcohol use and mental health issues among 5<sup>th</sup>-year college students was to compare 5<sup>th</sup>-year students to each other.

The comparison of males and females reflects a demographic comparison commonly found in the college student literature.

Alcohol Use: Consistent with the literature,<sup>31-33</sup> males were more likely to consume alcohol than females across all five alcohol use items. In examining the proportion of drinkers across past 30 day use, hours of alcohol use, and number of drinks items, only slightly more males reported drinking than females. For example, 81.5% of males drank at least once in the past 30 days, compared to 75.3% of females. Proportions were more stable on the hours and number of drinks items, although all were statistically significant ( $p < 0.005$ ). Greater differences were seen on the past 2 week items. Fifty-seven percent of males reported at least one binge drinking (at least 5 drinks) episode in the past 2 weeks, while only 34.3% of females binged at least once.

Examining the reported alcohol use items revealed even more striking discrepancies in alcohol use behavior between male and female 5<sup>th</sup>-year students. Males drank, on average, over 7 drinks per occasion, compared to almost 4.5 drinks for females. Males had 3 binge episodes in the past 2 weeks, while females engaged in two. While on the whole, males are by far the riskier drinkers; these findings raise a similar issue as the year-in-school comparisons- that the “average” male and female alcohol-consuming 5<sup>th</sup>-year students should be classified as binge drinkers. Despite drinking less, females are more susceptible to the physiological effects of alcohol use<sup>33</sup> and they should therefore still be considered risky users. Males also were more likely to experience alcohol-related consequences than females. These findings are consistent with previous research on increased alcohol use among male college students.<sup>32, 33</sup>

Given that males make up a greater proportion of 5<sup>th</sup>-year students, than 1<sup>st</sup>- to 4<sup>th</sup>-

year students, one is tempted to infer from these results that heavy alcohol use is related to increased time to graduation. Klein<sup>84</sup> reports that males' consumption of alcohol remained similar from freshman to senior year. Overall consumption for males was considered "moderate" in Klein's work (2-3 drinks per occasion). Females were more likely to decrease consumption from freshman to senior year. Applying Klein's findings on patterns of alcohol use with this study's findings on male 5<sup>th</sup>-year student consumption of alcohol may point to a consistent pattern of increased heavy drinking throughout college which contributes to increased time to graduation. Conversely, in applying the education literature, the increase in the proportion of 5<sup>th</sup>-year male students is due in part to the choice of major.<sup>25, 77</sup> Engineering is a major which often requires five years to complete and Engineering remains dominated by males.

Mental Health: Because alcohol use and mental health are often related, it was hypothesized that males would also be more likely to experience mental health issues than females. The results of this study support the opposite assumption. Females were more likely than males to report symptoms of any level (mild, moderate, or severe). Males also were less likely to be diagnosed with Depression, as well as being treated if they were diagnosed. Across the Mental Health Status items, with the exception of Substance Abuse, males were less likely to experience symptoms or have been diagnosed than females. Males were only more likely to experience academic consequences as a result of ADD, Internet use/Computer games, and Learning Disability. These findings are generally consistent with existing literature.<sup>53</sup>

Why 5<sup>th</sup>-year females are more likely to report mental health issues than males is not immediately apparent from the data. It may be that females are just more likely to

report problems than males.<sup>55</sup> Males may perceive the need to hide any symptoms or experiences, an extension of the alcohol literature supporting masculine norms.<sup>36, 37</sup> Alternatively, males' patterns of drinking to reduce stress<sup>27</sup> might actually work.

Summary: The second specific aim of this study hypothesized that Male 5<sup>th</sup>-year students were more likely to consume more alcohol and experience more mental health issues than females. Overall, the results of the analysis only support the alcohol use portion of the hypothesis. Males were more likely to consume alcohol than females across all five alcohol use items, while females were more likely to report mental health symptoms of any level and were more likely to report experiences or diagnoses than males.

#### Fifth-year Students: Comparison of Racial Groups

Racial comparisons are another demographic commonly found in the college student literature. The hypothesis tested White students against all other racial groups, including students who identified with more than one race, or did not report a race.

Alcohol Use: Frequency and quantity of alcohol consumption was highest for Whites and the No Race Reported group. The findings for White students are consistent with current literature.<sup>39, 40</sup> This study appears to be the first study specifically to address alcohol use among students not reporting a race, therefore it is difficult to assess the accuracy of these findings. Out of all students, both Whites and the No Race group drank an average of 3-5 days out of the month, while all other groups only drank 1-2 days. Both Whites and the No Race group drank more than 5 drinks over 3.5 hours. Other racial groups ranged from 2.78 – 4.58 drinks across 1.85 – 3.12 hours. Also consistent with the literature,<sup>31, 33, 39, 41</sup> Blacks consumed the least amount of alcohol for the least



amount of time of all racial groups.

Among students who consume alcohol, Whites and the No Race Reported group had the greatest proportion of drinkers across the five items. Almost 90% of White students drank at least one drink the last time they “partied,” and they consumed an average of six drinks. Half of Whites and the No Race Reported students had at least one binge drinking episode in the past 2 weeks. Conversely, 73% of Blacks had at least one drink (an average of 3.75 drinks) and only 23% had a binge drinking episode.

Consequences of alcohol use followed similar patterns as actual use. Half (48.7%) of Whites reported experiencing at least one consequence, compared to only one in four (27.1%) Blacks. Physical injury to self, others, and fighting were most commonly reported among the No Race Reported group. Whites and the No Race Reported group were most likely to forget where they were or what they did as a result of alcohol use. Although Native Americans were not among the highest drinkers in any category, they were most likely to report doing something they later regretted and experiencing academic consequences that did not directly affect GPA. While not among the highest drinking group, Hispanic students were most likely to suffer GPA-lowering academic consequences.

**Mental Health:** Overall, Whites were most likely to report only experiencing Mild symptoms (exhausted, overwhelmed) than all other racial groups. The most likely group to experience at least Moderate symptoms (very sad, hopeless, depressed) was Native Americans. However, Asian students were most likely to report feeling hopeless and depressed. The No Race Reported group was most likely to report Severe symptoms

(feeling suicidal, attempted suicide); however Black and Asian students were most likely to report attempting suicide.

Frequency of Mental Health Symptoms varied extensively. Blacks were most likely to report feeling exhausted and overwhelmed less than once per month, more than any other groups, while Whites and No Race Reported students reported feeling exhausted and overwhelmed at least once per month, more than any other group. The Other Race group was most likely to report feeling very sad, hopeless, and depressed at least once per month. Asian students reported experiencing hopeless and depressed less than once per month, more than other racial groups. Although the No Race Reported group was most likely to feel suicidal, Asian students and the More than 1 Race Reported group were the most likely to attempt suicide.

Whites and the More than 1 Race Reported students were most likely to have been diagnosed with Depression than all other groups. Blacks were least likely to be diagnosed, but most likely to have been diagnosed in the past year. The No Race Reported group was least likely to be in therapy for depression, but most likely to be taking medication.

The highest proportion of students experiencing at least one symptom or diagnosis of a mental health disorder was the More than 1 Race Reported group (45%), however they were only most at-risk for Depression. They had the greatest proportion of students who experienced Depression in the past year, both with and without a diagnosis. Native Americans were most at-risk for Anxiety. Students in the Other racial group were most at-risk for Anorexia, Chronic Fatigue, and Seasonal Affective Disorder. Students in the No Race Reported group were most at-risk for Bulimia and Substance Abuse.

Mental Health Consequences varied greatly by racial group, though neither Whites nor Blacks were most likely to experience any of the observed consequences. The More than 1 Race Reported group was most likely to experience at least one or more consequences, and most likely to experience consequences resulting from ADD and Sleep Difficulty. Asian students were most likely to experience academic consequences resulting from Internet Use/Computer games, Relationship difficulty, and Stress. The No Race Reported students were most affected by Concern for a friend or family member, Depression/Anxiety/SAD, and Learning Disability. Native American students were most likely to be affected by the Death of a friend or family member, and Hispanics by Eating Disorders.

Given the limited literature on mental health issues among racial groups, it is difficult to anchor the current findings of mental health variation across racial groups. The findings do appear to paint a much clearer picture of mental health issues among racial groups, particularly since minorities are less likely to seek treatment. Evidence supports the assertion that mental health issues among racial and ethnic minorities are expressed more as symptoms<sup>58, 59</sup> than diagnoses and that the interpretation of those symptoms varies by group.<sup>60</sup> These findings demonstrate that minority students are equally, if not more, at-risk than White students.

Summary: The second specific aim of this research study hypothesized that Whites students were more likely to consume more alcohol and experience more mental health issues than students of other racial groups. The results of the analysis support only that Whites were more likely than other races to consume more alcohol and to have been diagnosed with Depression and Anorexia than other racial groups.

### Fifth-year Students: Comparison of A/B GPA and C/D/F GPA Students

While comparisons based on sex and race are informative, the comparisons are inadequate to establish risk, as risk cannot be determined solely based on sex or race. Fifth-year students were compared based on GPA, grouped as low-risk (A/B GPA) and high-risk (C/D/F GPA). As no such previous literature exists examining students based on GPA to compare these results to, this discussion can only infer conclusions on the basis of these results.

Alcohol Use: Students with C/D/F GPAs consumed significantly ( $p < 0.005$ ) more alcohol than A/B GPA students, with the exception of hours of alcohol use. Both groups drank alcohol 3-5 days during the month. Among all students, C/D/F students consumed more than five drinks per occasion while A/B students drank slightly less than five. The proportion of students that reported drinking were very similar for both groups, though C/D/F students were significantly ( $p < 0.005$ ) more likely to be drinkers. While mean scores indicated that both groups of students on average drank 3-5 days of the month, the mean scores were much closer to 6-9 days of drinking per month for C/D/F students. C/D/F drinkers reported drinking more than six drinks in a four-hour span, while A/B students drank 5.5 drinks during the same amount of time. As with the previous group comparisons, the amounts of alcohol consumed by each group also point to binge drinking behavior being the average drinking behavior among 5<sup>th</sup>-year students when compared by GPA. C/D/F students also engaged in almost three binge drinking episodes in the past 2 weeks, compared to 2.6 episodes for A/B students.

Although the rates of alcohol use were similar between groups, C/D/F students were more likely to experience all of the consequences, including twice the proportion of

students experiencing academic consequences. Although no previous literature exists on 5<sup>th</sup>-year college students against which to compare these findings, these findings support the literature that uncovered the increase in alcohol use with year in school,<sup>85-88</sup> as well as the academic consequences related to alcohol use.<sup>85</sup>

**Mental Health:** C/D/F students were more likely to report experiencing Severe symptoms (felt suicidal, attempted suicide) than A/B students who were more likely to report feeling only Mild or Moderate symptoms. However, by individual symptom, both groups were equally likely to report feeling overwhelmed, and C/D/F students were more likely to report feeling all Moderate and both Severe symptoms. C/D/F students also experienced feeling very sad, hopeless, depressed, suicidal, and attempted suicide with greater frequency than A/B students. A/B students only reported feeling overwhelmed and exhausted more often than C/D/F students.

While the same proportion of A/B and C/D/F students had been diagnosed with depression, C/D/F students were more likely to have been diagnosed in the past year, be in therapy, and currently on medication. These results point to a clear relationship between depression and increased time in school. In addition, the results indicate the depression/grade relationship is affected by the proximity to diagnosis of Depression and current treatment of depression.

**Summary:** The second specific aim of this study hypothesized that 5<sup>th</sup>-year students with C/D grade point averages were more likely to consume more alcohol and experience more mental health issues than A/B average students. In terms of C/D/F students, substantial evidence supported the hypothesis. C/D/F students were more likely to consume more alcohol and were more likely to experience alcohol-related

consequences than A/B students. Additionally, they were more likely to experience Moderate and Severe Mental Health Symptoms. While they were less likely to be diagnosed with and being treated for depression, they were more likely to experience mental health disorders without a diagnosis, as measured by the Mental Health Status variable. And finally, they were more likely to experience Mental Health-related consequences to their academic performance, regardless of effect on GPA.

#### Predictors of C/D/F GPA

The statistically significant predictors of C/D/F GPA in 5<sup>th</sup>-year students were: hours of alcohol use, number of drinks, doing something later regretted as a result of alcohol use, academic performance affected by alcohol use, feeling exhausted, feeling hopeless, Anxiety, Chronic Fatigue, Depression, Seasonal Affective Disorder, Substance Abuse, ADD, Concern for friend or family member, Death of a friend or family member, Internet use/Computer games, Learning Disability, Sleep difficulty, and stress.

Alcohol Use: As expected, academic consequences were predictive of low GPA. Additionally, for every hour of alcohol use, students were less likely to have a C/D/F GPA. However, for every drink they consumed, students were more likely to have a C/D/F GPA. While the increase in hours of alcohol use as a protective factor certainly seems counter-intuitive, combined with the increased risk associated with the increased number of drinks may point to riskier drinking behavior as being the better predictor of C/D/F GPA in 5<sup>th</sup>-year students. These findings are consistent with previous literature associating alcohol use with lowered GPA.<sup>11, 85</sup>

Mental Health Symptoms: The variation in risk associated with the type of mental health symptom points to increased risk associated with increased severity of symptoms.

These findings support the existing literature.<sup>17, 21, 67-69</sup> Given that the overwhelming majority of students reported feeling overwhelmed or exhausted at least one time, it may be that these two symptoms can be considered “normal” within the context of the college environment. They are perhaps indicative of an adequate amount of challenge that positively contributes to a student’s overall development during the college years. Conversely, as demonstrated by the increased risk associated with more severe symptoms, moderate symptoms, such as sadness, hopelessness, and depression, should be used to screen students for potential risk.

**Mental Health Status:** The results of the regression analysis and SEM identified five of the measured mental health disorders as statistically significant predictors of C/D/F GPA: Anxiety, Chronic Fatigue Syndrome, Depression, Seasonal Affective Disorder, and Substance Abuse. In all cases, the status of the disorder was indicative of a decreased likelihood of having a C/D/F GPA. While this seems counterintuitive on the surface, looking specifically at the status reveals some logical consistencies. In the case of Depression, students who had been diagnosed in the past, but had not experienced symptoms in the past year were less likely to have a C/D/F GPA. These findings indicate that lower GPA is not due to the diagnosis itself, but the presence of (unmanaged) symptoms. As previous literature only supports a negative relationship between Depression and GPA<sup>69, 70</sup> these findings provide a more specific view of the relationship between Depression and GPA. Substance Abuse followed a similar pattern to Depression in that a past diagnosis of Substance Abuse but no current experiences was associated with lowered risk of C/D/F GPA while current experience but no diagnosis was associated with increased risk of C/D/F GPA. These results may point to past Substance

Abuse as being a reason that a student may be in school for more than four years.

The findings related to Chronic Fatigue Syndrome and Seasonal Affective Disorder are interesting, however scant research exists on these two disorders in college students. It is therefore difficult to speculate why they may be protective factors in predicting low GPA, particularly since the purported highest risk group (current experience with no lifetime diagnosis) were least likely to have a C/D/F GPA.

On the surface, the findings related to Anxiety also seem counterintuitive. All three levels of Anxiety status were significantly associated with decreased risk of C/D/F GPA. Most of us likely associate anxiety with a negative stress response and therefore negative outcomes. However, recent literature<sup>114</sup> has emerged pointing to properly managed anxiety as being beneficial. These students may have learned to respond positively to their anxiety, whether through formal training or in the natural course of life experience.

**Mental Health Consequences:** Consequences affecting GPA were expected to be significant predictors of C/D/F GPA. ADD and Learning Disability were two predictors that appear to be somewhat easier to manage, but instead were some of the most likely to increase the risk of C/D/F GPA. Having ADD nearly doubled the odds of having a C/D/F GPA. Consequences as a result of Concern for a friend or family Member, Death of a friend or family Member, and Internet Use/Computer Games issues are issues that are likely less apparent to an outside observer. Unlike ADD or a Learning Disability which are diagnosable and become part of a student's medical records, the same cannot be said of concern for others or excessive computer usage. Sleep difficulties and Stress also were significant predictors of C/D/F GPA, however they, too, are difficult to clearly



pinpoint since they are not diagnosable mental health disorders. Instead, both are signs of larger issues and are related to many of the other disorders measured in this set of questions.

Although not a significant predictor of C/D/F GPA, the Depression/Anxiety/Seasonal Affective Disorder item was associated with increased risk of C/D/F GPA. In this model, the predictive power of Depression may have been reduced by combining it with Anxiety and Seasonal Affective Disorder both of which were associated with decreased risk of C/D/F GPA in the Mental Health Status variables.

Summary: The third specific aim of this study was to develop a predictive model of risk in 5<sup>th</sup>-year students. Risk was defined as having a C/D/F GPA. Increased risk of C/D/F GPA was associated with increased alcohol use and moderate to severe mental health symptoms. Mental Health Status also was predictive of C/D/F/GPA, but increased or decreased risk varied by disorder. Overall, Mental Health Consequences were predictive of increased risk for C/D/F GPA, although not all findings were statistically significant.

#### Limitations

The limitations to this study were typical of those analyzing secondary data. The analysis was constrained by the data that were collected and the format in which it was collected in the original dataset. For example, conclusions cannot be differentiated based on reasons for remaining in school longer than 5 years (i.e., major requirements that result in slower progress) as that information is not available in the dataset. Additionally, the majority of the data were continuous concepts collected as categorical and ordinal data, with large numbers of category responses in some cases. Some questions contained

seven to ten possible categorical responses, resulting in categories that were collapsed to limit the complexity of some analyses and the corresponding results.

The cross-sectional nature of the dataset also was a limitation in this study. Although several years worth of data were available, because it was a series of snapshots no true longitudinal conclusions could be drawn, particularly in the case of trends in alcohol use from 1<sup>st</sup>- to 5<sup>th</sup>-year students.

Another limitation was the self-report nature of the data and as with all self-report data it ran the risk of recall bias or false reporting. However, as this dataset has been found to be reliable and valid,<sup>115</sup> this shortcoming was likely a minimal factor. The interpretation of some questions (i.e., feeling “overwhelmed” or “exhausted”) may have been differentially interpreted by respondents. Additionally, some variables were combined in the survey instrument that could have benefited from being asked as separate questions.

### Strengths

Although this study had several limitations, it has many strengths. A major strength of this study is that it used a large, nationally representative dataset. Another strength was that the data included in the national NCHA-I dataset came only from schools who randomly select participants. Both of these strengths increase the generalizability of the findings of the study.

Conceptually, this study utilized a conceptual framework which included different types of factors (person, behavior, and environment) and acknowledges the reciprocal relationship between the variables. Consequently, the use of Structural Equation Modeling to examine these relationships was another strength of the study because it

allows for the interaction of predictor variables on the outcome variable.

### Implications

The results of the study have implications to research, policy, and practice.

Overall, the study increased our understanding of the relationship between alcohol use and mental health issues in 5<sup>th</sup>-year students and highlighted the lack of overall health knowledge about this population.

**Research Implications:** This study is the only study thus far that specifically examines 5<sup>th</sup>-year college students on any health-related variable. This study advances our knowledge of the complex relationship between alcohol use and mental health in a previously unknown population. More work is needed to predict who is at risk for becoming a 5<sup>th</sup>-year student. These findings yield three major research recommendations. The first is to conduct case-control studies among 5<sup>th</sup>-year students to develop separate profiles for those who are intentionally enrolled (i.e., academic major requirements or athletic requirements) for more than five years and those who are not. Within these groups, case-control studies also should compare male and female students. The second is to follow these studies with more rigorous longitudinal prospective studies to better track the trajectory of individual students over time. The third is to explore the dynamic between alcohol use and mental health issues and their contribution to the 5<sup>th</sup>-year student population.

**Policy Implications:** At the policy level, this study informs decision makers about the need for effective alcohol and psychosocial interventions to prevent 5<sup>th</sup>-year students from becoming at-risk and decreasing their time to graduation. Health service practitioners now have a more effective tool to develop the necessary interventions.

These findings yield two major policy recommendations. The first is to increase alcohol use interventions targeted at 5<sup>th</sup>-year college students. The second is to increase access to mental health services targeted at 5<sup>th</sup>-year students. The third is to increase the awareness of the interaction between alcohol use and mental health in 5<sup>th</sup>-year college students.

Implementing policy changes among a 5<sup>th</sup>-year student population may be easier said than done when related to alcohol use. Once students reach the legal drinking age, legal consequences associated with alcohol use become more of an “alcohol and...” behavior. As 5<sup>th</sup>-year students are above the legal drinking age, the heavy drinking patterns exhibited by 5<sup>th</sup>-year students in and of themselves are not illegal. Likewise, strict enforcement of policies on campus is a challenge with 5<sup>th</sup>-year students as many of them do not live on campus. Policies are needed that focus more on the environmental aspects of the college community. Reducing the availability of alcohol on-campus as well as in the surrounding community is one target. Another approach includes efforts to educate older students on the harms associated with heavy alcohol use and providing models of responsible alcohol behavior, similar to those currently used on first-year students. A consistent, balanced message throughout the college years is likely to be more effective than either an outright ban or just letting the behavior go.

Implementing the proposed types of policy changes requires collaboration between all areas of the university community. Alcohol use and mental health issues are traditionally the purview of the student affairs unit of a college campus, while academic performance is the responsibility of the academic affairs unit. The interaction between alcohol use, mental health issues, and academic performance as illustrated in this study point to a need for collaboration between academic affairs and student affairs units.

Practice Implications: The research findings and policy implications described above serve as a basis for practice-based solutions to these issues. Utilizing the multidisciplinary behavioral tools and interventions that search for underlying problems that precede the creation of an at-risk 5<sup>th</sup>-year student is an essential step for providing the highest level of care and quality of educational experience for this population. The findings point to two major practice implications. The first is to shift the current alcohol programming from primarily 1<sup>st</sup>-year student focused to programs that target students throughout the college experience. Programs should maintain a consistent message that focuses on responsible drinking behavior for legal-age students. The second is to increase awareness of the prevalence of mental health disorders on college campuses, as well as providing students with appropriate educational interventions to help deal with the mild and some of the moderate symptoms that are common on campuses.

### Conclusion

The goal of this study was to provide the evidence base that would lead to reduced problematic alcohol use among 5<sup>th</sup>-year students. The specific objective of this study was to develop a profile of at-risk 5<sup>th</sup>-year students. Having established that 5<sup>th</sup>-year students are a distinct group with its own level of risk for alcohol use and mental health issues, targeted efforts are needed for their early identification and risk reduction. Recommendations for future research include case-control and longitudinal studies that identify the predictors of becoming a vulnerable 5<sup>th</sup>-year student. Staying in school longer than normal may be evidence of a delay in their development from adolescence to adulthood and may have long-term consequences. Not only is this a personal issue, it is an institutional one as well. Though 5<sup>th</sup>-year students signal successful retention efforts,

too many students languishing in school past the traditional four-years is a drain on university resources. Thus, the prevention and the timely response to the problem of 5<sup>th</sup>-year students are to the benefit of the university community as a whole.

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APPENDIX A: NCHA-I SURVEY INSTRUMENT



# American College Health Association

## National College Health Assessment

**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.

This survey is completely anonymous. 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!**

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PAGE ONE

PLEASE DO NOT WRITE IN THIS AREA

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**The first 8 questions ask about health, health education, and safety.**

**1. Considering your age, how would you describe your general health?**  
 Excellent    Very good    Good    Fair    Poor    Don't know

**2. On which of the following health topics have you ever received information from your college or university? (Select all that apply)**

<input type="checkbox"/> Tobacco use prevention	<input type="checkbox"/> Pregnancy prevention
<input type="checkbox"/> Alcohol and other drug use prevention	<input type="checkbox"/> AIDS or HIV infection prevention
<input type="checkbox"/> Sexual assault/relationship violence prevention	<input type="checkbox"/> Sexually transmitted disease (STD) prevention
<input type="checkbox"/> Violence prevention	<input type="checkbox"/> Dietary behaviors and nutrition
<input type="checkbox"/> Injury prevention and safety	<input type="checkbox"/> Physical activity and fitness
<input type="checkbox"/> Suicide prevention	<input type="checkbox"/> None of the above

**3. Use the scale below to record the BELIEVABILITY of each source of health information.**

Unbelievable

Neither Believable nor Unbelievable

Believable

**4. Do you usually get health-related information from any of the following sources?**

(Please mark the best response for each question to the right)

				No	Yes
Leaflets, pamphlets, flyers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Campus newspaper articles	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Health center medical staff	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Health educators	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Friends	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Resident assistants/advisors	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Parents	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Religious center	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Television	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Magazines	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Campus peer educators	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Faculty/coursework	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Internet/world wide web	<input type="radio"/>	<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"/>	<input type="radio"/>

**5. 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 didn't do this within the last 12 months

a. Wear a seatbelt when you rode in a car?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. Wear a helmet when you rode a bicycle?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. Wear a helmet when you rode a motorcycle?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d. Wear a helmet when you were inline skating?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**6. Within the last 12 months, were you:**

	Yes	No
In a physical fight?	<input type="radio"/>	<input type="radio"/>
Physically assaulted (do not include sexual assault)?	<input type="radio"/>	<input type="radio"/>

**PAGE TWO**

7. Within the last 12 months, have you experienced:	Yes
Verbal threats for sex against your will?	No <input checked="" type="radio"/>
Sexual touching against your will?	<input type="radio"/>
Attempted sexual penetration (vaginal, anal, oral intercourse) against your will?	<input type="radio"/>
Sexual penetration (vaginal, anal, oral intercourse) against your will?	<input type="radio"/>
8. Within the last 12 months, have you been in a relationship that was:	
Emotionally abusive?	<input type="radio"/>
Physically abusive?	<input type="radio"/>
Sexually abusive?	<input type="radio"/>

The next 11 questions ask about alcohol, tobacco, and drugs.

9. Within the last 30 days, on how many days did you use: (Mark one for each row)	Have used, but not in last 30 days		3-5 days	6-9 days	10-19 days	20-29 days	All 30 days
	Never used						
Cigarettes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cigars	<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"/>
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"/>
Marijuana (pot, hash, hash oil)	<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"/>
Amphetamines (diet pills, speed, meth, crank)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Rohypnol (roofies), GHB or Liquid X (intentional use)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other drugs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

10. Within the last 30 days, how often do you think the typical student at your school used: State your best estimate. (Mark one for each row)	Used daily		Used daily	
	One or more days	Never used	One or more days	Never used
Cigarettes	<input type="radio"/>	<input type="radio"/>	Amphetamines (diet pills, speed, meth, crank)	<input type="radio"/>
Cigars	<input type="radio"/>	<input type="radio"/>	Rohypnol (roofies), GHB or Liquid X (intentional use)	<input type="radio"/>
Smokeless tobacco	<input type="radio"/>	<input type="radio"/>	Other drugs	<input type="radio"/>
Alcohol (beer, wine, liquor)	<input type="radio"/>	<input type="radio"/>		
Marijuana (pot, hash, hash oil)	<input type="radio"/>	<input type="radio"/>		
Cocaine (crack, rock, freebase)	<input type="radio"/>	<input type="radio"/>		

One drink or alcoholic beverage is defined as a 12 oz. beer, a 4 oz. glass of wine, a shot of liquor, or a mixed drink.

11. Within the last 30 days, did you:	Yes
	No
Drive after drinking any alcohol at all	<input type="radio"/>
Drive after having 5 or more drinks	<input type="radio"/>

12. The last time you "partied"/socialized, how many hours did you drink alcohol? State your best estimate. (If less than 10, code answers as 00, 01, 02, etc.)

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

13. The last time you "partied"/socialized, how many alcoholic drinks did you have? State your best estimate. (If less than 10, code answers as 00, 01, 02, 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"/>



The next 11 questions ask about sex behavior, perceptions, and contraception.

20. Within the last 12 months, with how many partners, if any, have you had sex (oral, vaginal, or anal)? (If less than 10, code answers as 00, 01, 02, etc.)

PARTNERS

00	01
02	03
04	05
06	07
08	09
10	11
12	13
14	15
16	17
18	19
20	21

21. Within last 12 months, were your sexual partner(s), if any,

N/A    Female  
 Male    Both Male and Female

22. Within the last 12 months, with how many partners do you think the typical student at your school has had sex (oral, vaginal, or anal)? (If less than 10, code answers as 00, 01, 02, etc.)

PARTNERS

00	01
02	03
04	05
06	07
08	09
10	11
12	13
14	15
16	17
18	19
20	21

(Please mark the appropriate column for each row)

23. Within the last 30 days, if you are sexually active, how many times did you have:

	Have not done this during last 30 days	Never did this sexual activity	1-2 times	3-4 times	5-6 times	7-8 times	9-10 times	11 or more times
Oral sex?								
Vaginal Intercourse?								
Anal Intercourse?								

(Please mark the appropriate column for each row)

24. How many times within the last 30 days do you think the typical student at your school has had:

	0 times	1-2 times	3-4 times	5-6 times	7-8 times	9-10 times	11 or more times
Oral sex?							
Vaginal Intercourse?							
Anal Intercourse?							

(Please mark the appropriate column for each row)

25. Within the last 30 days, if you are sexually active, how often did you or your partner(s) use a condom during:

	Have not done this during last 30 days	Never	Rarely	Sometimes	Mostly	Always	CONDOM USE
Oral sex?							
Vaginal Intercourse?							
Anal Intercourse?							

(Please mark the appropriate column for each row)

26. Within the last 30 days, how often do you think the typical student at your school has used a condom during:

	The typical student at my school does not participate in this sexual activity	Never	Rarely	Sometimes	Mostly	Always	CONDOM USE
Oral sex?							
Vaginal Intercourse?							
Anal Intercourse?							

(Please mark the appropriate column for each row)

	Never did this sexual activity	No	Yes	Don't know/Don't remember
27. If you are sexually active, did you use a condom the last time you had:				
Oral sex?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Vaginal intercourse?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Anal intercourse?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

28. If you have had vaginal intercourse, what method did you or your partner use to prevent pregnancy the last time? (Select all that apply)

<input type="checkbox"/> Have not had vaginal intercourse	<input type="checkbox"/> Spermicide (e.g. foam)
<input type="checkbox"/> Birth control pills	<input type="checkbox"/> Fertility awareness (calendar, mucus, basal body temperature)
<input type="checkbox"/> Depo Provera (shots)	<input type="checkbox"/> Withdrawal
<input type="checkbox"/> Norplant (implant)	<input type="checkbox"/> Other method
<input type="checkbox"/> Condoms (male or female)	<input type="checkbox"/> Nothing
<input type="checkbox"/> Diaphragm/Cervical cap/Sponge	

29. Within the last 12 months, if you are sexually active, have you or your partner(s) used emergency contraception ("morning after pill")?

No    Yes    Don't know    Not sexually active

30. Within the last 12 months, have you unintentionally become pregnant or gotten someone else pregnant?

Have not had vaginal intercourse within the last 12 months    No

Yes    Don't know

31. Have you ever been tested for HIV infection?

No    Yes    Don't know

32. Which of the following best describes you?

Heterosexual    Bisexual    Unsure

Gay/Lesbian    Transgendered

33. If you have a credit card(s) how much total credit card debt did you carry last month? That is, what was the total unpaid balance on all of your credit cards (that you are responsible for paying)?

<input type="checkbox"/> None, I don't have any credit cards/I'm not responsible for paying	<input type="checkbox"/> \$1 - \$99	<input type="checkbox"/> \$2,000 - \$2,999
<input type="checkbox"/> \$100 - \$249	<input type="checkbox"/> \$3,000 - \$3,999	<input type="checkbox"/> \$4,000 - \$4,999
<input type="checkbox"/> \$250 - \$499	<input type="checkbox"/> \$5,000 - \$5,999	<input type="checkbox"/> \$6,000 or more
<input type="checkbox"/> \$500 - \$999		
<input type="checkbox"/> \$1,000 - \$1,999		

34. What is your approximate cumulative grade average?

A    B    C    D/F    N/A

**The next 5 questions ask about weight, nutrition, and exercise.**

35. How do you describe your weight?

Very underweight    Slightly overweight

Slightly underweight    Very overweight

About the right weight

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

I am not trying to do anything about my weight    Lose weight

Stay the same weight    Gain weight

37. Within the last 30 days, did you do any of the following? (Select all that apply)

Exercise to lose weight

Diet to lose weight

Vomit or take laxatives to lose weight

Take diet pills to lose weight

I didn't do any of the above

38. How many servings of fruits and vegetables do you usually have per day (1 serving = 1 medium piece of fruit, 1/2 cup chopped, cooked or canned fruits/vegetables, 3/4 cup fruit/vegetable juice, small bowl of salad greens, or 1/2 cup dried fruit)?

I don't eat fruits and vegetables

1-2

3-4

5 or more

(Please mark the appropriate column for each row)

	0 days	1 day	2 days	3 days	4 days	5 days	6 days	7 days
39. On how many of the past 7 days did you:								
Participate in vigorous exercise for at least 20 minutes or moderate exercise for at least 30 minutes?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Do exercises to strengthen or tone your muscles, such as push-ups, sit-ups, or weight lifting?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Get enough sleep so that you felt rested when you woke up in the morning?	<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 SIX**

PLEASE DO NOT WRITE IN THIS AREA

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The next 4 questions ask about mental and physical health.

(Please mark the appropriate column for each row)

40. Within the last 12 months how many times have you:

5-6 times 7-8 times  
3-4 times 9-10 times  
1-2 times 11 or more times  
Never

- Felt things were hopeless
- Felt overwhelmed by all you had to do
- Felt exhausted (not from physical activity)
- Felt very sad
- Felt so depressed that it was difficult to function
- Seriously considered attempting suicide
- Attempted suicide

41. Have you ever been diagnosed with depression?

Yes  No

(If you responded "no," please go to question 42)

**If Yes:** Have you been diagnosed with depression within the last 12 months?  
Are you currently in therapy for depression?  
Are you currently taking medication for depression?

Yes  
No

(Please mark the appropriate column for each row)

42. Have you:

Don't Know  
Yes  
No

- Been vaccinated against hepatitis B?
- Been vaccinated against meningococcal disease (meningococcal meningitis)?
- Been vaccinated against varicella (chicken pox)?
- Been vaccinated with measles, mumps, rubella (2 shots)?
- Been vaccinated against influenza (the flu) in the last year?
- Had a dental exam and cleaning in the last year?
- (Males) Performed testicular self exam in the last month?

- (Females) Performed breast self exam in the last month?
- (Females) Had a routine gynecological exam in the last year?
- Had your blood pressure checked in the last 2 years?
- Had your cholesterol checked in the last 5 years?
- Used sunscreen daily?

Don't Know  
Yes  
No

Have you ever been diagnosed with any of the following?

Yes  
No

Within the last 12 months, have you had any of the following?

Yes  
No

43. (Please make two marks in the appropriate columns for each row)

- Allergy problems
- Anorexia
- Anxiety Disorder
- Asthma
- Bulimia
- Chronic Fatigue Syndrome
- Depression
- Diabetes
- Endometriosis
- Genital herpes
- Genital warts/HPV
- Hepatitis B or C
- High blood pressure
- High cholesterol
- HIV infection

Have you ever been diagnosed with any of the following?

Yes  
No

Within the last 12 months, have you had any of the following?

Yes  
No

- Repetitive stress injury (e.g. carpal tunnel syndrome)
- Seasonal Affective Disorder
- Substance abuse problem
- Back pain
- Broken bone/fracture
- Bronchitis
- Chlamydia
- Ear infection
- Gonorrhea
- Mononucleosis
- Pelvic Inflammatory Disease
- Sinus infection
- Strep throat
- Tuberculosis

**The next question asks about impediments to academic performance.**

- 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

44. Within the last 12 months, have any of the following affected your academic performance? (Please select the most serious outcome for each item below)

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"/>
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 Disorder	<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 illness (diabetes, asthma, etc.)	<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/Anxiety Disorder	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Seasonal Affective Disorder	<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"/>
HIV infection	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Injury	<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"/>
Mononucleosis	<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 difficulty	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sexually transmitted disease	<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"/>
Other _____	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**The last questions ask about demographic characteristics.**

45. How old are you? Years

46. What is your sex?  
 Female  
 Male

47. What is your height in feet and inches?

Fl.	Inch	Years
0	0	0
1	0	1
2	0	2
3	0	3
4	0	4
5	0	5
6	0	6
7	0	7
8	0	8
9	0	9

48. What is your weight in pounds?

Pounds
0
10
20
30
40
50
60
70
80
90
100

49. Year in school:

- 1st year undergraduate
- 2nd year undergraduate
- 3rd year undergraduate
- 4th year undergraduate
- 5th year or more undergraduate
- Graduate or professional
- Adult special
- Other

50. Are you a full-time student?

- Yes  No

51. How do you usually describe yourself? (Mark all that apply)

- White - not Hispanic (includes Middle Eastern)
- Black - not Hispanic
- Hispanic or Latino
- Asian or Pacific Islander
- American Indian or Alaskan Native
- Other

52. Are you an international student?

- Yes  No

53. What is your current relationship status?

- Single  Separated
- Married/domestic partner  Divorced
- Engaged or committed dating relationship  Widowed

54. Where do you currently live?

- Campus residence hall  Off-campus housing
- Fraternity or sorority house  Parent/guardian's home
- Other university/college housing  Other

55. Are you a member of a social fraternity or sorority?

- (National Interfraternity Conference, National Panhellenic Conference, or National Pan-Hellenic Council)
- Yes  No

56. How many hours a week do you work for pay?

- 0 hours  30-39 hours
- 1-9 hours  40 hours
- 10-19 hours  more than 40 hours
- 20-29 hours

57. How many hours a week do you volunteer?

- 0 hours  30-39 hours
- 1-9 hours  40 hours
- 10-19 hours  more than 40 hours
- 20-29 hours

58. Do you have any kind of health insurance (including prepaid plans such as HMOs - health maintenance organizations)?

- Yes  No  Not sure



## APPENDIX B: NCHA-I DATA USE AGREEMENT

American College Health Association

▲ 891 Elkridge Landing Road, Suite 100  
Linthicum, MD 21090  
Tel: (410) 859-1500  
Fax: (410) 859-1510  
www.acha.org

September 10, 2010

James Studnicki, ScD  
University of North Carolina at Charlotte  
Dept of Public Health Sciences  
9201 University City Blvd.  
Charlotte, NC 28223

Dear James,

Thank you for submitting a request to utilize ACHA-NCHA data in your study, "Relationships between Mental Health Issues and Alcohol and Sexual Risk Behaviors." Your request has been approved and enclosed you will find a CD containing the Spring 200 – Spring 2008 ACHA-NCHA Reference Group datasets.

I have enclosed a copy of our data use guidelines and agreement for your information. Your signed copy is on file in my office. Please note that additional studies using the ACHA-NCHA data acquired through this request require submission of a new data use request to the ACHA-NCHA Program Office.

As stated in the agreement, we would appreciate a copy of any final products that result from your research.

Please don't hesitate to contact me if you have any questions.

Best of luck in your efforts,

A handwritten signature in black ink that reads "Mary Hoban".

Mary Hoban, PhD, CHES  
Director, ACHA-NCHA Program Office

Enclosure: ACHA-NCHA Data Use Guidelines and Agreement





### Data Use Guidelines

The ACHA-NCHA data contain information about high-risk behaviors, and all data are confidential. ACHA will not release data on any institution, nor will it release data sets where it is possible to identify any participating schools. Individuals who are granted access to any ACHA-NCHA data must adhere to ACHA's data use guidelines, which follow. Failure to sign or to adhere to the attached agreement will result in immediate termination of data use privileges.

The accuracy of the users' statistical analyses and the findings they report are not the responsibility of the American College Health Association. ACHA shall not be held liable for improper or incorrect use of the data.

### Data Use Agreement

**Signing this agreement does not guarantee your request will be approved; however, this section must be complete for your application to be considered.**

By signing below, I agree to the following:

- I will reference the American College Health Association when reporting any data obtained from the ACHA-NCHA utilizing the following standard format (items in **Arial** font are specific to the data you receive and must be completed appropriately):  
American College Health Association. American College Health Association-  
National College Health Assessment, Survey Period(s) [computer file].  
Baltimore, MD: American College Health Association [producer and distributor]; (YYYY-MM-DD of distribution).
- I will grant access to ACHA-NCHA data to only those individuals specified in this *Data Use Request Form*. Should the need to grant access to additional individuals arise, I will contact the ACHA Research Director immediately.
- If my institution requires, I will obtain all necessary Institutional Review Board (IRB) approval for secondary data analysis prior to beginning my research, and I will provide ACHA with appropriate documentation of IRB approval.
- I will provide ACHA with any final products produced using ACHA-NCHA data, which include but are not limited to: professional journal manuscripts, professional conference presentations, student theses/dissertations, book chapters, policy documents, fact sheets, and brochures.

*Signed copy on file at ACHA, 08/10/10*

## APPENDIX C: IRB PROTOCOL APPROVAL



## Office of Research Compliance

9201 University City Boulevard, Charlotte, NC 28223-0001  
 t/ 704.687.3311 f/ 704.687.2292 <http://research.uncc.edu/compliance-ethics>

**Institutional Review Board (IRB) for Research with Human Subjects***Approval of Exemption*

<b>Protocol #</b>	<b>11-11-07</b>		
<b>Title:</b>	<b>Alcohol Use and Mental Health Issues in Fifth-Year College Students</b>		
<b>Date:</b>	<b>11/14/2011</b>		
<b>Responsible Faculty</b>	<b>Dr. Michael</b>	<b>Thompson</b>	<b>Public Health Sciences</b>
<b>Investigator</b>	<b>Ms. Pilar</b>	<b>Zuber</b>	<b>Public Health Sciences</b>

The Institutional Review Board (IRB) certifies that the protocol listed above is exempt under category 4 (45 CFR 46.101).

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.

This approval will expire one year from the date of this letter. In order to continue conducting research under this protocol after one year, the "Annual Protocol Renewal Form" must be submitted to the IRB. Please note that it is the investigator's responsibility to promptly inform the committee of any changes in the proposed research, as well as any unanticipated problems that may arise involving risks to subjects. Amendment and Event Reporting forms are available on our web site: <http://research.uncc.edu/compliance-ethics/human-subjects/amending-your-protocol> or <http://research.uncc.edu/compliance-ethics/human-subjects/reporting-adverse-events>

	<b>11-22-11</b>
Dr. M. Lyn Exum, IRB Chair	Date

