

DOES FACEBOOK IMPACT COLLEGE STUDENTS' ALCOHOL CONSUMPTION?

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(Begin the abstract here, typewritten and double-spaced. A dissertation abstract should consist of 350 words or less including the heading. A page and one-half is approximately 350 words. Document should not be right justified.)

## **DEDICATION**

## ACKNOWLEDGEMENTS

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## CHAPTER 1

### INTRODUCTION

As young adults go off to college many are entering a new phase in their lives, that while exciting, includes increased responsibilities and decision-making that up to this point has been made by others. This experience can be both liberating and challenging yet some students may feel overwhelmed, in response to the stressors brought on by the unfamiliarity of the situation (Hicks & Miller, 2006). Parents still have an influence in the new student's daily lives but peer pressure and the potential impact this has on their choices increases in college (Wood, Read, Mitchell & Brand, 2004). Adjusting to this new found independence can be overwhelming for some, leading them to use alcohol as a means of stress reduction (Sheppard, 2011; Vaez & Laflamme, 2003).

Research has shown that peer approval and the perceived norms about other college students' alcohol consumption, are strong predictors of how much alcohol an individual student will drink (Bosari & Carey, 2001; Testa, Kearns-Bodkin, & Livingston, 2009). Fournier and Clarke (2011) recently revealed that "students who live away from home are reportedly more affected by social influences than students living at home" (para. 2). Johnston, O'Malley, Bachman and Schulenberg (2005) noted that drinking rates were considerably higher among university students, than their peers not in college suggesting the university setting was a contributing factor.

Unfortunately the negative consequences linked with alcohol consumption are often overlooked by students. The 2011 U. S. Department of Health and Human Services [DHHS] data revealed this age group had the highest alcohol-related motor vehicle accidents and deaths in the United States. The DHHS (2011) data revealed that college students ages 18-24 years old that

drank alcohol, engaged in high-risk behaviors more often than their peers who were nondrinkers. This included engaging in sexual activities while intoxicated, although the students who drank reported they were unable to recall the details of these incidents when sober. Nearly 25% of respondents had *some recollection* of having sexual intercourse, but when asked could not confirm that the incident was consensual (DHHS, 2011).

As the advances in technology have increased students ability to stay in contact with their friends, these media have also created what has been referred to as an *irresistible need to connect with their peers* (Ellison, Steinfeld & Lampe, 2007; Fodeman & Monroe, 2009; Kabre & Brown, 2011). Boyd and Ellison (2007) noted if and when individuals decided to be friends on SNS like Facebook, the most common reason was a shared activity or interest offline. Boyd and Ellison defined SNSs as places that “allow individuals to (1) construct a public or semi-public profile within a bounded system, (2) articulate a list of other users with whom they share a connection, and, (3) view and traverse their list of connections within the system” (p. 211).

Facebook is the number one social networking website in the world, with the most recent data showing 845 million active users (Facebook, 2012). In 2010, Facebook surpassed Google as the most visited website in the United States (Dougherty, 2010). Over 90% of university students have an active Facebook account (Freberg, Adams, McGaughey, & Freberg, 2010; Smith & Caruso, 2010; Junco, 2012) with 94% of first year college students visiting social networking websites each week (Higher Education Research Institute [HERI], 2007).

Antoci, Sabatini, and Sodini (2010) reported that, “the use of the internet is strongly related to being connected to social networking sites, which in turn brings about engagement in social activities” (p. 6). Antoci et al. (2010) added that “what makes social network sites unique, is not that they allow individuals to meet strangers but rather that they enable users to articulate

and develop their social networks” (p. 4). Pempek et al. (2009) noted that while the dissemination of information on SNS involves “a one-to-many communication style similar to the way television and radio have been used in the past, the novel capacity is the personal control and creation of the content being ‘broadcast’”. (p. 237)

Wilson, Gosling and Graham (2012) recently reported that among the reasons social researchers study Facebook is that:

Activities performed on Facebook (e.g., connecting to others, expressing preferences, providing status updates) can leave a wealth of concrete, observable data in their wake. Therefore, the domain provides many new opportunities for studying human behavior that previously had to rely on behaviors that were difficult to assess. (p. 204)

Studies have increased confirming that more and more college students are intentionally exhibiting behaviors on Facebook that they feel would be considered socially acceptable among their friends (Brock, 2007; Peluchette & Karl, 2010; St John, 2006). Add to this the fundamental need among young people to be accepted by their peers, and Facebook becomes an alternate environment where students may feel pressured to conform. Peluchette and Karl (2010) noted:

Many Facebook users intentionally misrepresent themselves or join groups that do not accurately depict who they are for the sake of humor or social approval...[and that] many students make a conscious attempt to portray a particular image, and those who post problematic information do so to impress a particular audience, their peers. (pp. 31, 35)

This seemingly innate desire to impress others has lead many researchers to examine the particular influences peers have on the choices people make (Kabre & Brown, 2011; Moreno et al., 2010; Sheppard, 2011). Data on college students’ in particular showed that that peer pressure was among of the top reasons students’ reported for drinking alcohol (Larmier et al., 2009;

Neighbors, Lee, Lewis, Fossos, & Larimer, 2007; Orford, Krishnan, Balaam, Everitt, & Van der Graaf, 2004; Wood, Read, Palfai & Stevenson, 2001). What is more, students indicated that the positive aspects of acceptance among their peers were more important than any negative consequences associated with their own alcohol consumption (Dodd, Glassman, Arthur, Webb, & Miller, 2010).

### **Statement of the Problem**

While young people today may be more technologically advanced than past generations, they remain just as vulnerable to the marketing strategies commonly found in print and televised media (Mart, 2009; 2011; Moreno et al., 2012). Technology has simply shifted the focus towards designing marketing strategies that utilize these new media, with advertising campaigns for alcohol-related products soliciting unique text messages, ringtones, and wallpaper backgrounds available for free through their company websites.

Mart, Mergendoller, and Simon (2009) found in their review of alcohol references on Facebook that “thousands of alcohol-related fan pages, events, groups, and applications are accessible by users under the legal drinking age” (p. 889). Mart (2011) reported:

In the last 5 years, social networking platforms such as Facebook, Twitter, and YouTube have emerged as major players in alcohol marketing campaigns...[with] the main goal of social media tactics for alcohol ad campaigns is to encourage positive word-of-mouth about the product from members of social networks to others in their networks.

While Facebook has developed specific policies regarding the promotion and advertising of alcohol-related products or activities through their site, Mart et al. (2009) found that these rules were rarely enforced.

College students' ages 18-24 years old are among the largest users of online social

networking sites (Dahlstrom, de Boor, Grunwald, & Vockley, 2011; eMarketer, 2009; Freberg, Adams, McGaughey, & Freberg, 2010; Smith & Caruso, 2010; Junco, 2012; Fournier & Clarke, 2011; Moreno et al., 2012) with a growing number of students using these venues to share and/or promote alcohol-related behaviors of themselves or that of their friends (Egan & Moreno, 2011; Fournier & Clarke, 2011; Moreno et al., 2012). While Egan and Moreno (2011) found that roughly 80-85% of college students had references to alcohol in their online profiles, very few published studies have examined students' rates of Facebook use and alcohol consumption.

### **Purpose of the Study**

The purpose of this study was to investigate whether college students' use of the social networking site Facebook influenced their alcohol consumption. In particular, the relationship between students' alcohol use and exposure to alcohol-related content through various features or activities on Facebook was examined. An additional focus was to identify whether certain variables increased the chances of predicting students' alcohol and Facebook use.

### **Research Questions**

1. What is the relationship between students' alcohol consumption and Facebook use?
2. What is the relationship between students' alcohol consumption and invitation to alcohol-related parties, exposure to alcohol-related advertisements, groups, photos, fan pages, applications or wall posts on Facebook within the last 30 days?
3. To what extent can students' sex, rank, age, employment status, enrollment, or GPA predict their Facebook use?
4. To what extent can students' sex, rank, age, employment status, enrollment, or GPA predict their alcohol consumption?

### **Research Design**

The study employed a non-experimental, quantitative, descriptive and correlational research design using survey methodology. According to Isaac and Michael (1995), the purpose of correlational research is to “investigate the extent to which variations in one factor correspond with variations in one or more other factors based on correlation coefficients” (p. 53). Burns & Grove, (2005) noted that through descriptive correlational designs, researchers are able to examine the relationship between multiple variables.

### **Study Sample**

The final sample consisted of 502 undergraduate college students, 18-24 years of age who were enrolled at a large, four-year research institution fully accredited by the Higher Learning Commission - North Central Association of Colleges and Schools. Three-hundred and one (60%) of participants were male with the remaining 201 (40%) female.

### **Data Collection**

Once approval was granted by the Human Subjects Committee at the researcher's institution, procedures for data collection began. Data for the study was collected within the student center at the participating institution from January 21-31, 2010. Eligible participants were solicited to complete a self-administered instrument measuring various aspects of their alcohol and Facebook use. Every student who submitted a survey were eligible to enter their name into a drawing to win one of three iPod Shuffles.

Data collection was closed after 550 completed surveys were submitted. The researcher randomly selected the names of three students as winners of the iPod Shuffles and subsequently contacted them making arrangements to claim their prizes. Once collection procedures were completed, the survey data was entered into a database and prepared for analysis in order to

answer the research questions for this study.

### **Data Analysis**

The data were analyzed using the Statistical Package for the Social Sciences (SPSS) 19.0. Statistics computed for all variables included frequencies, percentages, measures of central tendency and dispersion. Other statistics to determine significance included the Spearman rank correlation and multiple regression analyses. An alpha level of .05 was used to determine statistical significance.

### **Significance to Health Education**

Hingson, Zha and Weitzman (2009) reported that “the persistence of college drinking problems underscores an urgent need to implement prevention and counseling approaches identified through research to reduce alcohol-related harms among college students and other young adults” (p. 12). This problem is exacerbated by the growing use of social networking sites to promote alcohol-related products and activities to college students. This new media is inexpensive and “can increase product exposure to specific target audiences – exponentially” (Mart, 2011, p. 889).

With roughly 97% of all college students reportedly having a SNS profile, alcohol companies have virtually limitless access to this audience. Mart (2011) reported that more “effective public health policies designed to restrict alcohol advertising and limit access to youth-friendly drinks through increased prices and product bans are rare in the United States” (Mart, 2011, p. 889). Mart added that “more exposure to alcohol advertising contributes to higher levels of risky drinking behaviors in youth...increasing positive expectancies and attitudes about alcoholic beverages” (p. 889).

As such, educators are faced with the goal of reducing the risks associated with excessive

drinking among college students while confronting the corrupt marketing strategies of the alcohol industry. At present, researchers are beginning to review personal content from users profiles on Facebook and comparing these findings with scores on established measures of alcohol use to identify problem drinkers (Moreno et al., 2012). Initiatives like this are at the forefront of possible ways to use the sharing of information on SNS in order to educate students on the negative consequences related to excessive alcohol consumption.

As health educators we must have a better grasp of the power and influence SNS have on the individual or group behaviors of college students today. Especially as large alcohol corporations with billion dollar budgets, create innovative advertising campaigns to entice students and create the illusion that spontaneous fun is inevitable just as long as *their* alcoholic beverage is consumed (Peluchette & Karl, 2010; Reed, Lange, Ketchie & Clapp, 2007; Sheppard, 2011).

### **Assumptions**

1. Participants responded honestly to the survey items.
2. Participants understood the survey items and interpreted them as the researcher intended.

### **Limitations**

1. The data for the study relies on self-reporting by participants.
2. Students at the participating institution may not be representative of all undergraduate college students aged 18-24 years old.

### **Delimitations**

1. The study was limited to undergraduate students enrolled at the time data was collected at the participating institution.
2. Only students between 18-24 years old were eligible to participate in the study.

3. Only students actively enrolled in classes at the time data was collected were eligible to participate in the study.

### **Definition of Terms**

The following definitions are provided to ensure uniformity and understanding of these terms throughout the study.

*Binge Drinking.* Binge drinking is defined as consuming four or more drinks in a row for men and four or more drinks in a row for women (Wechsler & Kuo, 2000).

*Facebook.* Facebook's mission is to give people the power to share and make the world more open and connected (Facebook, 2012).

*Facebook application.* Applications on Facebook are designed to enhance your experience on the site with engaging games and useful features like Events and Photos. Some apps are built by Facebook developers, but most are built by outside developers who use Facebook's APIs and abide by Facebook's Developer Principle and Policies (Facebook 2012).

*Facebook event.* Events are a feature that lets your organize gatherings, respond to invites, and keep up with what your friends are doing (Facebook, 2012).

*Facebook fan page.* Fan pages are specific pages of interest that can be dedicated to a person, event, or subject matter based on a common interest.

*Facebook group.* Groups are close circles of people that share and keep in touch on Facebook (Facebook, 2012).

*Facebook photos.* A feature that lets you share images and tag the people in them (Facebook, 2012).

*Social media.* Social media are forms of electronic communication (as Web sites for social networking and micro-blogging) through which users create online communities to share

information, ideas, personal messages, and other content (as videos)

*Wall post.* Your Wall is the space on your profile where you and friends can post and share (Facebook, 2012).

### **Summary**

The need for the study, significance of the study, and the rationale for the study were addressed in this chapter. The chapter also presented information on the limitations of the study, the delimitations of the study, assumptions made, and definition of terms. In Chapter 2, literature that was relevant to this study was reviewed. Chapter 3 presents the methodologies for this study with the results presented in Chapter 4. Chapter 5 includes the findings, conclusions, discussion and recommendations.

## **CHAPTER 2**

### **LITERATURE REVIEW**

#### **Overview**

This chapter demonstrates an in-depth review of the existing literature associated with alcohol consumption and online social networking. The chapter will provide literature showing the need for this study, as well as further research on online social networking and its relationship to health education. The literature review will cover topics including alcohol use among college students, defining binge drinking, the reasons for drinking, factors associated with alcohol consumption (gender, age, ethnicity), binge drinking, consequences of alcohol consumption among college students, student perceptions of alcohol consumption, media and marketing affect on alcohol consumption, and social networking.

#### **Purpose of Study**

The purpose of this study was to investigate whether college students' use of the social networking site Facebook influenced their alcohol consumption. In particular, the relationship between students' alcohol use and exposure to alcohol-related content through various features or activities on Facebook was examined. An additional focus was to identify whether certain variables increased the chances of predicting students' alcohol and Facebook use.

#### **College Students Alcohol Use**

Alcohol use among college students has remained prevalent with roughly 85% of students reporting having drunk use at least once in the past year (Core Institute, n.d.; Johnston, O'Malley, Bachman & Schulenberg, 2009). Practically every college student experiences the effects of alcohol consumption, regardless of whether they drink or not. This is because the

problem is not always associated with drinking itself, but rather the negative consequences that are the result of students' overindulgences (National Institute on Alcohol Abuse and Alcoholism National Advisory [NIAAA], 2012).

Several large-scale studies have examined college students' alcohol use over time including the Harvard School of Public Health *College Alcohol Survey* (CAS), the *Core Alcohol and Drug Survey* (Core Survey), and *National College Health Assessment* (NCHA). These studies have significantly contributed to the field of health education as the results have provided support for initiatives aimed at reducing college students' alcohol consumption (Moreira, Smith, & Foxcroft, 2009).

For most students, the consumption of alcohol during college is viewed as a part of the overall experience. What is more, "traditions reinforce students' expectations that drinking is essential to social success in the college environment" (Gover, 2010, p. 29). For some students, going off to college represents the first time they are charged with the responsibility of making their own decisions which, until now, were made with assistance of family and friends (Borsari et al., 2007). Students must decide for themselves whether they want to go to class, complete their class assignments, engage in new relationships, and how to spend their free time. For some students, this independence is impacted by the desire to fit in; therefore, the choices they make are oftentimes influenced by their new peers (Jones, Helfinger, & Saunders, 2007; Kapner, 2008; Wilke, Siebert, Delva, Smith, & Howell, 2005).

Some college students automatically associate the consumption of alcohol with overindulgence and intoxication (Wechsler & Nelson, 2008). The NIAAA (2012) recently reported that four out of five college students drink alcohol, and that roughly half of all students who drink engage in binge drinking. This agency indicated that binge drinking involved an

individual consuming enough alcohol within a two-hour period to increase their blood alcohol content to .08 or above. On average, this means four drinks for women and five drinks for men within this period.

According to Presley et al. (2004), 86% of students surveyed believed that drinking was an important component in male students' social lives, whereas only 73% felt that drinking was central in the social activities of female students. If the majority of students believe that alcohol is a central component of social activities, it follows that they would want to consume alcohol based on that belief. According to Berkowitz and Perkins (1986), "motivations for student alcohol use may include drinking to enhance sociability or social interaction, to escape negative emotions or to release otherwise unacceptable ones, or simply to get drunk" (p. 21).

Reasons why students drink can also be found in their beliefs about the outcome of drinking. Presley et al. (2004), examined the reasons reported by students for drinking alcohol. The results revealed that 73.1% of students drank to break the ice, 71.9% indicated drinking alcohol enhanced social activity, 68.1% gives people something to do, 61.2% gives people something to talk about, 57.4% allows people to have more fun, 55.7% facilitates a connection with peers, 55.6% facilitates male bonding, and 50.7% facilitates sexual opportunities. The results of the study were similar to the two prior studies by the researchers; all would appear to indicate that alcohol acts as a social lubricant by breaking the ice, facilitating bonding, filling a void in time by giving individuals something to do, and allowing individuals to loosen up, have fun, and communicate better with their peers.

Harford, Wechsler, Muthén, and Bengt (2002) examined the potential relationship between rates of heavy drinking while students were in high school, alcohol-related issues in college, and their place of residence. Data from 6,525 students attending 119 four-year colleges

in the United States was examined in 1993, 1997, and 1999. The results showed that students living off campus with their parents had less alcohol-related problems than those who lived on-campus. The results indicated that students who engaged in heavy drinking in high school were had higher probabilities of problems on all outcome measures.

### **Factors Associated with College Students' Alcohol Consumption**

#### **Gender**

Gender is reported as a contributing factor regarding alcohol consumption among college students, with research showing males consumed on average more alcohol than female college students (Biscaro et al., 2004; Broman, 2005; Dreer, Ronan, Ronan, Dush & Elliott, 2004; Ham & Hope, 2003; Johnston et al., 2009; Presley et al., 2004; Wechsler, Dowdall, Davenport, & Rimm, 1995). Table 1 shows data on the rates of excessive drinking by gender, with rates of drinking consistently higher among males in these studies.

Core survey data show that males had consistently higher rates of binge drinking than females during this period, a 3% decrease was reported among male students from 51.4% in 1991 to 48.4% in 1994. Wechsler et al. (2002) reported binge drinking rates based on the College Alcohol Survey administered in 1993, 1997, 1999, and 2001. Similar to the Core data, males had higher reported rates of binge drinking than females. However, the percentage of males and females engaging in binge drinking were relatively stable changing little over four years reported.

Table 1

*Studies Reporting Male and Female College Students' Rates of Binge Drinking.*

Study/Authors	Years	Total N	Males N (%)	Females N (%)
<b>Core Alcohol and Drug Survey</b>				
Presley, Meilman, & Lyerla, 1993).	1989-91	53,299	11,297 (51.4)	10,907 (35.0)
Presley, Meilman, Cashin, & Lyerla, 1996	1991-93	38,897	7,723 (48.2)	7,528 (33.0)
Presley, Meilman, & Cashin, 1996	1992-94	42,530	8,689 (48.4)	7,349 (30.7)
<b>College Alcohol Survey (CAS)</b>				
Wechsler et al. (2002)	1993	15,282	3,232 (49.2)	3,397 (39.0)
Wechsler et al. (2002)	1997	14,428	2,799 (48.5)	3,324 (38.4)
Wechsler et al. (2002)	1999	13,954	2,732 (50.2)	3,354 (39.4)
Wechsler et al. (2002)	2001	10,904	2,170 (48.2)	2,618 (40.9)
<b>American College Health Association-National College Health Assessment (ACHA-NCHA)</b>				
ACHA-NCHA Reference Report, 2000	2000	15,757	2,652 (48.0)	2,946 (35.0)
ACHA-NCHA Reference Report, 2001	2001	16,541	2,563 (45.0)	2,579 (27.0)
ACHA-NCHA Reference Report, 2002	2002	27,534	5,112 (54.0)	5,523 (35.0)
ACHA-NCHA Reference Report, 2003	2003	19,278	3,028 (51.0)	4,087 (33.0)
ACHA-NCHA Reference Report, 2004	2004	46,564	7,292 (47.0)	9,164 (32.0)
ACHA-NCHA Reference Report, 2005	2005	53,438	9,478 (51.0)	11,031 (33.0)
ACHA-NCHA Reference Report, 2006	2006	93,727	14,286 (46.0)	18,232 (32.0)
ACHA-NCHA Reference Report, 2007	2007	71,011	11,853 (48.0)	14,445 (33.0)
ACHA-NCHA Reference Report, 2008	2008	79,406	12,907 (47.0)	16,288 (32.0)

The ACHA-NCHA data revealed the greatest variation between male and female binge drinking rates. In 2000, the rates of male and female binge drinking differed by 13%, with males consuming more alcohol; however, by 2002, this had increased to 19%, which is by far the greatest variation among all the studies. In subsequent years, the ACHA-NCHA found that the variation continued to change slightly, but held steady in 2007 and 2008 at 15%.

Wechsler et al. (1995) examined whether there was a difference in the reported rates of alcohol consumption, problems attributed to drinking and body mass index (BMI) among male and female college students. The results revealed a higher number of alcohol-related problems in females with problems including hangovers, missed classes, and falling behind in schoolwork.

When BMI was examined between genders, the results remained the same reinforcing that females metabolize alcohol at slower rates than males.

This evidence indicated a need for a new definition for binge drinking, due to females' lower rates of gastric metabolism of alcohol. When comparing the results of the study, the researchers noted that the percentage of female binge drinkers increased from 33% (the old definition for binge drinking is the consumption of five or more drinks within two hours, regardless of gender) to 39% (the new definition for binge drinking is the consumption of five or more drinks for males, or four or more drinks for female within two hours).

Presley et al. (2004) looked at the average number of alcoholic beverages consumed in a week between men and women and found on males drank 8.9 drinks each week compared to 3.8 drinks for females. The researchers also found that more men than women drank six or more drinks per week, with 42.8% and 23.3% drinks consumed respectively.

### **Age**

Another demographic variable linked with the consumption of alcohol and college students was age. The students considered most at risk are traditional freshmen (ages 18-19). One possible explanation for this is because many of these students are living away from their parents for the first time and taking advantage of their newfound "freedom." They tend to be more heavily influenced by the alcohol-saturated culture and advertising which, in some cases, can lead to unhealthy decisions. For example, Naimi et al. (2003) found the incidents of binge drinking among 18-24 year olds had increased 17% between 1993-2001. The researchers found that in 2001, subjects ages 18-20 averaged 15.3 incidents of binge drinking, and subjects ages 21 to 25 averaged 18 incidents of binge drinking per year. The subjects ages 18-25 had the highest rates of binge drinking, and during the study period, the 18-25 year old subjects had the highest

increase in binge drinking rates (56%). In the first Core Alcohol and Drug Survey conducted by Presley and Meilman (1992), the researchers broke down the subjects into two defined age groups. The first group was traditional students 24 years and younger, and the second group was nontraditional students 25 years or older. By dividing the subjects into two defined groups, the researchers were able to determine that traditional students at four-year and two-year institutions consumed more drinks per week on average than nontraditional students. Presley and Meilman found that in institutions with populations less than 2,500, traditional students consumed, on average, 6.9 drinks per week; nontraditional students consumed 2.27 drinks per week. In institutions with populations of 2,500-10,000, traditional students consumed, on average, 5.4 drinks per week; nontraditional students consumed 2.17 drinks per week. In institutions with populations of 10,000-20,000, traditional students consumed, on average, 5.36 drinks per week; nontraditional students consumed 2.42 drinks per week. In institutions with populations of 20,000 or more, traditional students consumed, on average, 4.59 drinks per week; nontraditional students consumed 2.57 drinks per week.

According to an article that examined data collected in 1993 and 1997 by Wechsler et al. (1998), the rate of binge drinking was reported at a consistently higher rate of 47.2% (N = 12,535) in 1993, and 45.5% (N = 12,052) in 1997 in subjects under 24 years old. Subjects 24 and older reported 28.4% (N = 2,568) in 1993, and 17% (N = 2,469) in 1997. This idea of younger students consuming more alcohol can also be found in research conducted by (Turrissi, R., Padilla, K.K., & Wiersma, K.A. 2000), in which the researchers found that underclassmen consumed a lower level of alcohol than their upperclassman peers. Moreover, (Bergen-Cico, 2000) found that, as students progress through their college career, their level of alcohol consumption decreases.

In the second Core Alcohol and Drug Survey conducted by Presley et al. (1997), the researchers examined drinks consumed per week by individuals under 21 years old, as well as 21 years and older. They found that from 1995-1997, subjects under 21 years old, on average, consumed 5.83 drinks per week, whereas subjects 21 years and older consumed, on average, 4.79 drinks per week. The results allowed the researchers to determine that younger students, on average, consumed more drinks than older students. In the third Core Alcohol and Drug Survey, Presley et al. (2004), examined the age of first usage of alcohol. They found that 11.7 % of the population had never used alcohol; most subjects' first usage of alcohol (59.3%) occurred from ages 14-17 years old.

### **Ethnicity**

Another demographic variable associated with drinking among college students is ethnic background. According to Caetano & Clack (1998), reported binge drinking was highest among white males at 20% in 1984. The smallest amount of binge drinking was 15%, reported by black males. Hispanic males reported a 17% rate of binge drinking in 1984. In 1995, however, the rate of binge drinking decreased among white males to 12%, but remained constant among black males at 15%, and among Hispanic males at 18%.

The highest reported rate of binge drinking among females in 1984 was white females at 5%, and black females, also at 5%. Hispanic females reported the lowest rate of binge drinking, 2%, in 1984. In 1995, black females' reported levels of binge drinking remained constant at 5%, while Hispanic females' reported rate of binge drinking increased to 3%. The lowest reported level of binge drinking was reported by white females, 2%, in 1995.

Whereas the previous study Caetano & Clack (1998) demonstrates a decrease in alcohol consumption among the white population, future studies, such as Wechsler et al. (1998) found

that the rate of binge drinking was actually highest in the white population. In this article, the researchers examined data collected in 1993 and 1997. The researchers reported that the rate of binge drinking among white individuals was 48.1% in 1993 and 46.8% in 1997. The lowest reported level of binge drinking came from the Black/African-American population, reporting 16.5% in 1993 and 18.3% in 1997.

Many studies have verified that ethnic background plays a large role in the consumption of alcohol. Naimi et al. (2003) is a study that examined data from the Behavioral Risk Factor Surveillance System. In this study, the researchers found that alcohol consumption varied based on the ethnic background of the subject. The data indicated that subjects with Hispanic backgrounds averaged 6.68 incidents of binge drinking a year, closely followed by subjects with Caucasian backgrounds averaging 6.6 incidents a year. Subjects with other listed as background averaged 5.96 incidents a year, and subjects with African American backgrounds averaged 4.48 incidents per year.

According to the 2007 National Survey on Drug Use and Health (NSDUH) (SAMHSA 2008c), alcohol consumption by adults (age 18 or older) is highest for Caucasians (N = 59.8%); followed by Native Americans (N = 47.8%); Hispanics (N = 46.3%); African Americans (N = 43.8%); and lowest for Asian Americans (N = 38.0%).

Heavy drinking is considered 5 or more drinks on the same occasion for 5 or more of the last 30 days. According to this definition, Native Americans have the highest prevalence of heavy drinking (N = 12.1%), followed by Caucasians (N = 8.3%), Hispanics (N = 6.1%), African Americans (N = 4.7%), and Asian Americans (N = 2.7%). A higher percentage of Native Americans (N = 29.6%) engage in binge drinking; percentages are lower for Caucasians (N = 25.9%), Hispanics (N = 25.6%), African Americans (N = 21.4%), and Asian Americans (N =

13.3%).

According to NIAAA (2006), these data show that drinking is most prevalent among the male population. Caucasian males had the highest rate of drinking (N = 74.27%); Caucasian females (N = 65.10%). Hispanic males had the second highest proportion (N = 69.99%); Hispanic females (N = 49.52%), followed by Native American males (N = 65.46%); Native American females (N = 51.66%). African American males had a slightly lower percentage (N = 62.62%); African American females (N = 45.92%). The lowest percentage of drinking was among Asian American males (N = 61.51%); Asian American females (N = 36.11%).

### **Binge Drinking**

In today's society, there is a debate about how to define problem drinking. Even the term "problem drinking" is a subject of debate. Should it be called mass consumption of alcohol, binge drinking, problem drinking, at-risk drinking, or mass consumption? To understand what binge drinking is, we first have to understand how it is defined and measured.

The controversy on what qualifies an individual as a binge drinker was recently addressed on the website of the *Journal of Studies on Alcohol and Drugs* (2012). The policy for submissions that report binge drinking has been changed, as it is noted that "it has become increasingly apparent that the clinicians and researchers who submit to the Journal of Studies on Alcohol and Drugs have been using the term "binge" or "binge drinking" to describe quite different phenomena" (para. 1). The policy now is as follows:

In order to avoid the confusion that can potentially arise when different clinical phenomena are being described by the same name, the Journal has now adopted a policy that requires the term "binge" to be used in a specific way in accepted manuscripts.

According to the policy, the term "binge" should only be used to describe an extended

period of time (usually two or more days) during which a person repeatedly administers alcohol or another substance to the point of intoxication, and gives up his/her usual activities and obligations in order to use the substance. It is the combination of prolonged use and the giving up of usual activities that forms the core of the definition of a "binge."

If authors are using the word "binge" to mean something other than the extended period of intoxication with concomitant neglect of activities/obligations as described above, we ask that they change their terminology. Alternative terms for the word "binge" include "heavy drinking"/"heavy use" or "heavy episodic drinking"/"heavy episodic use."

Authors who retain the term "binge" in their manuscripts must clearly show in the Methods sections to their papers that what they are actually measuring is a "binge" as described above (i.e., the several days of extended intoxication with interference in usual obligations and activities). (para. 2-4)

This definition and guidelines for reporting are different than current industry standard in which the term *binge* is defined as "the consumption of five drinks in a row for males or four drinks in a row for females on a single occasion within a 2-week time period" (Wechsler & Nelson, 2008, p. 2).

In 2004, the NIAAA approved the following definition/statement for binge drinking:

A "binge" is a pattern of drinking alcohol that brings blood alcohol concentration (BAC) to 0.08 gram percent or above. For the typical adult, this pattern corresponds to consuming 5 or more drinks (male), or 4 or more drinks (female), in about 2 hours. Binge drinking is clearly dangerous for the drinker and for society. (p. 3)

In the 2004 Winter issue of the NIAAA Newsletter, Dr. Lorraine Gunzerath, acting chief, Strategic Research Planning Branch in NIAAAs Office of Scientific Affairs, indicated that "the

task force was charged with developing a recommended definition of binge drinking for use in the field's future research efforts" (p. 3).

The January 2012 *CDC Vital Signs* Factsheet revealed that binge drinking was a much larger problem than previously reported. It is estimated that over 38 million adults in America engaged in binge drinking at a rate of four times a month. Moreover, individuals between the ages of 18-34 had the highest number of binge drinkers (CDC Vital Signs, 2012).

Wechsler et al. (1994) conducted the first representative national sample study to determine the levels of binge drinking in college students. A random sample of 140 four-year institutions from 40 different states yielded 17,592 subjects. To obtain a random sample, each university was given specific instructions of how to select students by starting at a random point on the student registry. The survey tool was a 20-page questionnaire that looked at the quantity and frequency of alcohol consumption, and 12 common consequences to alcohol consumption. The method for the delivery of the survey tool was the United States postal system. To encourage subjects to reply, the researcher provided a monetary reward in the form of entrance in a drawing for \$1000.00, \$500.00, and \$100.00. The final response rate for the survey was 69%. The researchers found that only 15% of the subjects were non-drinkers, 44% of all subjects in the study had binged within two weeks, 19% were regular binge drinkers, and 47% of those subjects that were binge drinkers reported having five or more of the 12 common consequences to alcohol consumption. Wechsler et al. concluded that the consumption of alcohol on college campuses was an epidemic. In (Wechsler et al., 2002), few changes in student binge drinking occurred between 1993 and 2001.

Naimi et al. (2003) conducted a study to measure the episodes of binge drinking in the United States. The sample for the study was taken from the 1993 and 2001 Behavioral Risk

Factor Surveillance System Survey data. The researchers found from 1993-2001, male subjects had on average 11 incidents of binge drinking per year, with female subjects averaging 2.32 incidents of binge drinking per year. Presley and Meilman (1992) found that 17.5% of the male subjects, and 12.9% of the female subjects in their study binge drank on more than three occasions two weeks prior to the survey

### **Consequences of Alcohol Consumption Among College Students**

According to the National Center on Addiction and Substance Abuse at Columbia University (1994), there are a number of negative consequences that surround the consumption of alcohol. These include unintentional injury, death, hangovers, and illness, as well as legal problems. What is more, high rates of alcohol consumption can negatively affect the physical, mental, spiritual, and social health of an individual. College students who drink alcohol in excess also have problems academically.

A number of studies have been conducted on the ramifications of excessive drinking among college students (Kapner, 2008; Marckinski, Grant, & Grant, 2009; Parks, & Grant, 2005; Patrick & Maggs, 2009). Sheffield, Darkes, Del Boca, and Goldman (2005) examined the problems among binge drinkers, non-binge drinkers and students who did not drink alcohol. The researchers separated the problems into those related to school, relationships, jobs, legal issues, and/or other problems. The researchers found that binge drinkers were 18% more likely to have problems in each of the areas listed than non-binge drinkers, and 23.6% more likely than abstainers.

Hingson et al. (2009) reported the results of survey data collected from 1999 through 2005 regarding alcohol-related problems and/or injuries or deaths among college students ages 18-24 years old. Their results revealed that:

From 1999 to 2005, the proportions of college students ages 18-24 who reported consuming five or more drinks on at least one occasion in the past month increased from 41.7% to 44.7%, and the proportions who drove under the influence of alcohol in the past year increased from 26.5% to 28.9%. (p. 12)

Engineer, Phillips, Thompson, and Nicholls (2003) conducted a study in which 16 focus groups were held in eight locations with 123 participants. The focus groups looked at the positives and negatives of binge drinking, motivations for drinking, and how the participants defined binge drinking. The focus groups found that individuals in this study felt that when they binge drank, they were not fully aware of their actions or the surroundings, and that their overconfidence gained from the massive consumption of alcohol led them to engage in dangerous or risk-taking behaviors. Students' engagement in risk-taking behaviors while binge drinking often resulted in negative consequences, which can be seen in the results of the study conducted by the National Center on Addiction and Substance Abuse at Columbia University (1994). The report indicated that 2% to 3% of the nation's undergraduate students die from alcohol related causes, 60% of sexually transmitted infections in women are related to the consumption of alcohol, and 20% of students do not practice safer sex when under the influence of alcohol. Approximately 95% of violent crime, 90% of all reported campus sexual assaults, and 80% of all vandalism were related to the consumption of alcohol. According to Hingson, Heeren, Winter, and Wechsler (2005), binge drinking by college student's results in 500,000 unintentional injuries and 600,000 assaults.

One of the largest concerns of drivers on today's roads is the number of impaired drivers. All too often, individuals who have had an excessive amount of alcohol become overconfident of their ability to successfully manipulate an automobile. Wechsler, Lee, Nelson and Lee (2003)

conducted a quantitative longitudinal study of 120 colleges with 10,904 subjects. The subjects were asked to complete a survey that examined basic demographics, the consumption of alcohol, and driving habits. The researchers found that 29.0% of the subjects in the study drove after the consumption of any amount of alcohol, 10.8% of the subjects drove after consuming at least five drinks, 23.0% of the subjects rode in the car with individuals who had been drinking. One aspect of the National College Health Assessment (2008) examined the incidence of driving after consuming alcohol. The results were as follows: 12.1% of the subjects in the study replied that they do not drive, 23.45% said they do not drink, 48.0% said they do not drink and drive, 16.5% of the subjects stated that they drink and drive. Presley et al. (1997) found that 17.2% in 1995 to 17.0% in 1997 drove under the influence one to two times, 7.1% in 1995 to 6.6% in 1997 drove under the influence three to five times, and 9.3% in 1995 to 9.0% in 1997 drove under the influence six or more times.

These studies provided evidence that students are consuming alcohol and then driving, and as a result, they can get in accidents that may lead to property damage, injury, and death. Although the numbers are still high, it would appear that the incidence of driving while under the influence of alcohol has leveled off, or possibly even decreased in recent years; even so, this does not detract from the possible harm that can come from drinking and driving.

Excessive alcohol consumption can also lead to detrimental physical effects, including vomiting, nausea, and hangovers. Presley et al. (1997), the researchers examined a number of negative consequences to the consumption of alcohol. The results for the year prior to the survey are as follows. The subjects' number of hangovers included: never had a hangover ranged from 40.5% in 1995 to 38.3% in 1997; one to two incidences ranged from 25.6% in 1995 to 25.2% in 1997; three to five incidences ranged from 13.9% in 1995 to 14.8% in 1997; and six or more

incidences ranged from 20.0% in 1995 to 21.7% in 1997.

Another consequence of alcohol consumption that the researchers examined was the incidence of nausea and/or vomiting by the subjects due to the consumption of alcohol. The study found that there has been an increase in negative behavior associated with alcohol consumption. Researchers found that 30.8% in 1995 and 32.3% in 1997 had one to two incidents of vomiting or nausea; 10.8% in 1995 and 12.1% in 1997 had three to five incidents; and 7.1% in 1995 and 8.1% in 1997 had six or more incidents. Based on the evidence in these studies, it would appear that there has been a small variation of the rate of hangovers in recent years; however, there has been an obvious increase in the occurrence of nausea/vomiting.

In the college setting, one of the most visible signs of a student's health is academic success. The National Center on Addiction and Substance Abuse - NCASA (1994) reported, "alcohol is implicated in more than 40% of all academic problems and 28% of all dropouts" (p. 21). Presley and Meilman (1992) indicated there was a strong relationship between the amount of alcohol a student consumed and their grade point average. These authors found that higher rates of alcohol consumption were correlated with lower grade point averages. Presley, Cheng, and Pimentel (2004) confirmed this, noting that students with an A average drank 6.8 drinks per week for males, and 3.8 drinks per week for females. However, students who consumed 14.1 drinks per week had 'D' or 'F' averages.

One possible reason for lowered grade point average is the fact that students are missing class due to the consumption of alcohol. The continued correlation of alcohol consumption and students missing classes is evident in the Core Institute's 1992, 1998, and 2004 reports to college presidents. In Presley and Meilman's (1992) report, the researchers indicated that 30.4% of the students who consumed alcohol had missed classes. Presley et al. (1997) reported that 29.6% of

the students who consumed alcohol had missed classes in 1995; 29.5% in 1996; and 32.5% in 1997. In later research conducted by the Core Institute, Presley et al. (2004) reported that students missed classes 32.1% of the time in 1998; 32.5% in 1999; and 33.1% in 2000.

In a study conducted by Pascarella et al. (2007), the researchers looked at the relationship between binge drinking, preparation for class, and student academic performance. The researchers sent out a survey to approximately 9,000 freshman and seniors at a large Midwestern university. The survey examined academic performance; time spent preparing for school, and rates of binge drinking. The researchers found that, of those subjects who binge drank, 58% were at risk of having academic problems. The subjects in this study who binge drank three to five times on average in a two-week period were found to be .19 standard deviations below the average for freshman, and .26 for seniors. The subjects in this study who binge drank six or more times on average in a two-week period were found to be .53 standard deviations below the average for freshman, and .35 for seniors. The researchers found that there was a negative relationship between binge drinking and GPA. As a result of consuming alcohol, it is evident in these studies that students' performance and participation diminishes. If students are to succeed, they must have the ability to actively engage in the academic setting.

Over a decade ago, a study that examined 66 four-year colleges and universities in the United States reported that students with an "A" average consumed approximately 3.2 drinks per week, which was less than that consumed by students with "B" (4.6), "C" (5.8), or "D/F" (8.4) averages (Presley et al., 1996). Furthermore, Wechsler et al. (2000), reported that students who participate in frequent heavy drinking episodes are considerably more likely to miss class and fall behind in class work than students who drink heavily only on occasion, or those who do not drink heavily at all.

Although it has also been found that alcohol is not necessarily a predictor of grade point average in Wood et al. (1997) conducted a prospective study that tracked a panel of 489 undergraduate students at the University of Missouri. The study found that alcohol usage during students' freshman year was moderately correlated with academic issues over a time period of 6 years ( $r = .32$ ). However, when additional constructs were added to a structural equation model, students' alcohol usage was not a unique predictor of potential academic problems. The pre-existing individual differences that are generally associated with academic troubles (i.e., high school class rank, academic proficiency) were the strongest indicators of students' subsequent academic deficits. Gender was also strongly related to students' academic problems. In a 6-year follow-up study involving the same students, Wood et al. (2000) found that alcohol use had a modest and negative association with educational achievement after controlling for other variables. In contrast to the cross-sectional findings that had been reported on the subject in the general body of literature, Wood and his colleagues concluded that the significance of the relationship between alcohol use and academic achievement is quite possibly rather small.

The idea that consumption of alcohol does not negatively affect academic success is demonstrated in an article written by Pascall and Freisthler (2003). The researchers followed a panel of 465 students for 3 years at the University of California, Berkeley, which has extremely competitive criteria for admissions. Their findings reported that heavy alcohol use, alcohol-related issues, and opportunities to drink did not have a significant affect on academic achievement. In an extensive review of studies on alcohol consumption and related problems among undergraduate students in the United Kingdom, Gill (2002) concluded that the association between drinking and academic achievement was "tenuous" and needed more study.

Presley et al. (1997) examined the relationship between the consumption of alcohol and

negative consequences among college students. The data were collected at 197 institutions from 1995-1997, resulting in a final sample of 93,679 students. The Core survey instrument was used for data collection. Results included the frequency and number of alcoholic drinks students consumed, potential consequences of students' drinking, and their reported perception of the effects of alcohol.

The researchers looked at the reported levels of drinking, including the average number of drinks per week and number of times students engaged in binge drinking two weeks prior to the survey. The report had four different classifications for consumption of alcohol by students, including non-users, infrequent drinkers, moderate drinkers, and frequent drinkers. Non-users were subjects that indicated they had not consumed alcohol within the last year. Infrequent drinkers were subjects who reported drinking alcohol one to six times in the last year. Moderate drinkers were identified as consuming alcohol from at minimum once a week to once a month. Frequent drinkers consumed alcohol from at least three times a week to every day.

The results showed that 17.7% of students indicated they were non-users in 1995, falling to 15.8% in 1997. Infrequent drinkers went down from 18.6% in 1995 to 17.5% two years later in 1997. Moderate drinking stayed relatively the same, with 41.6% reported in 1995 and 42.5% in 1997. The researchers noted that the increase in frequent use of alcohol from 22.0% in 1995 to 24.2% in 1997 put students at higher risk of the suffering negative consequences of drinking.

The report also examined the average number of drinks consumed in a week. Average number of drinks results were as follows: no drinks ranged from 39.4% in 1995 to 36.0% in 1997; one drink per week ranged from 12.3% in 1995 to 11.7% in 1997; two to nine drinks a week ranged from 28.4% in 1995 to 29.1% in 1997; and ten or more drinks in a week ranged from 19.9% in 1995 to 23.2 % in 1997. Furthermore, the researchers indicated that the average

student consumed 5.2 drinks a week, and noted that there was a noticeable increase in the number of heavy drinkers. The report also detailed the number of times the subjects had binge drank two weeks prior to the survey. The results were as follows: no incidents of binge drinking ranged from 58.6% in 1995 to 54.4% in 1997; one incident of binge drinking ranged from 13.2% in 1995 to 13.8% in 1997; two incidents of binge drinking ranged from 10.2% in 1995 to 10.2% in 1997; and three or more incidents of binge drinking ranged from 18.0% in 1995 to 21.5% in 1997.

### **Students' Perceptions of Alcohol Consumption**

Many studies have indicated that college students overestimate the amount of alcohol consumed by their peers. According to Presley et al. (2004) college students' perceptions of other students' alcohol use was nearly nine times higher than their actual rates of consumption. Such misperceptions can be demonstrated in the following studies, which examine estimation (both under and over) of college students' alcohol consumption.

The fall 2008 ACHA-NCHA II report noted the perceptions students had about other students' rates of alcohol consumption at their school. For example, students were asked to estimate the consumption of alcohol for the average college student within the last 30 days. The majority of the students (31.4%, n = 8,177) estimated that within the last month other students drank between 10-19 drinks. Participants were also asked to estimate the number of drinks the other college students consumed the last time they partied. The results revealed that only 5.6% (n = 1,455) of participants thought other students did not drink at all while 27.5% (n = 1,455) of respondents reported others drinking 3-4 drinks, with the largest number of students (32.4%, n = 8,489) reporting that other students drank on average 5-6 drinks the last time they partied.

The results from this survey revealed that students' overestimated the consumption of

alcohol by their peers. For example, students' self-reported use of any level of alcohol within the last 30 days was 63.1% (n = 16,444), compared to their estimation of 94.3% (n = 24,530) for other students at their institution. The 31.2% difference in the rates of consumption could mean one of two things: either the self-reporting of the subjects was dishonest, or the subjects honestly believe that their peers consume higher rates of alcohol.

Perkins, Meilman, Leichliter, Cashin, and Presley (1999) examined the differences between the self-reported rates of alcohol consumption and the perception of the average amount of alcohol consumption. Data for this study were taken from the Southern Illinois University Core Institutions data set from fall 1994 and spring 1996. The 48,168 subjects for this study came from 100 college campuses across the United States. The researchers took the subjects' self-reported consumption and perceived levels of consumption to determine the national averages for both factors. The findings were then compared to determine the accuracy of the subjects' perceptions. It was found that in this study, the subjects' perception would lead them to overestimate the amount of alcohol consumption. The highest accuracy level of subjects' perception of drinking was 36.8%, for the average amount of alcohol consumed in a week. The lowest point of accuracy for the subjects was 6.0%, for the average amount of alcohol consumed in a day. These results indicate that the subjects in the study did not have the ability to accurately predict the amount of alcohol that average college students consumed.

In a study conducted by Lewis and Neighbors (2004), 226 respondents identified their alcohol consumption with the results compared to gender specific and nonspecific norms. The results were similar to previous studies, in which college students reportedly overestimated the amount of alcohol consumed by their peers. The findings indicated that the mean for self-reported drinks consumed per week for women was 8.83. The male subjects perceived that the

mean drinks consumed per week for females were 15.17. The female subjects perceived that the mean drinks consumed per week for females were 12.41. The self-reported drinks consumed per week for males were 13.00. The male subjects perceived that the mean drinks consumed per week for males were 21.92. The female subjects perceived that the mean drinks consumed per week for males were 15.17. These results indicate that both male and female subjects overestimated their gender's consumption of alcohol (as well as that of the opposite gender); although it appears that male subjects had a larger difference between self-reported and perceived alcohol consumption levels.

Wechsler and Meichun (1999) examined the overestimation of binge drinking on college campuses. To do this, the researchers used data from the 1999 College Alcohol Study, which consisted of 14,138 students at 119 academic institutions across the United States. The researchers compared the subjects' perception of the average amount of binge drinking to the self-reported usage of alcohol. Unlike previous studies, the researchers found that 47% of students in the study underestimated the average binge drinking rate for their academic institution, 29% overestimated the rate, and 13% accurately estimated it. The results of this study indicate that the vast majority of students underestimate the rate of binge drinking at their institution. These findings are different from prior studies, which suggested that most students overestimate levels of binge drinking. Although the results of these studies are different, they all appear to indicate that students across the United States are not correctly identifying the levels of alcohol consumption in the university setting.

### **Marketing and College Students' Alcohol Consumption**

A large portion of many peoples' lives today is saturated with media influence. According to Agnes and Goldman (2003), media is defined as "means of communication such as

newspapers, radio, and television” (p. 402). There are many forms of media in today’s society, and companies that distribute alcohol have not been shy about exploitation of devices to disseminate information. In a study conducted by Madden and Gube (1991), the researchers found that there is one alcohol advertisement for every four hours of television. These results are similar to the prior study by Taylor, Silverglade, and Eskin (1992), which found that 4 to 5% of all U.S. commercials are for alcoholic beverages, with 8% of advertisements in newspapers, 18% in magazines, and 74% going to television and other media.

As the average American goes throughout their day, it is hard for them not to see or hear marketing for some product. Marketing can be found on and in TV, radio, newspapers, magazines, billboards, movies, and the Internet; more specifically, Facebook. The marketing of products is an important aspect of their distribution to the general public. Even products that could be considered a household name, such as Coca-Cola and others, are widely marketed to the public. According to Global Marketers (2009), the Coca-Cola Company spent 721.5 million dollars in 2008 in the United States, and 2.67 billion dollars worldwide to market their product. Other companies, such as Anheuser Busch, spent 1.46 billion dollars; Pepsi Co spent 958.2 million; and the United States Government spent 1.2 billion dollars to market their product. This high level of spending demonstrates that marketing of a product is an effective way to encourage use of the product.

Snyder, Milici, Slater, Sun, and Stizhakova (2006) conducted a longitudinal study examining the relationship between advertisement and the consumption of alcohol. Subjects ranging in age from 15 to 26 years were randomly selected from 75 locations that were determined to be major media markets. To determine the subjects’ usage of alcohol, the researchers asked the subjects the following: how many days did the subjects drink in the past

four weeks, the average number of drinks consumed a day, and the maximum number of drinks consumed a day. To determine the amount of alcohol advertisement that was present in the study, the researchers relied on self-reporting from subjects. Also, the researchers examined the amount of money spent in advertisement in each market area.

To analyze the data, the researcher used multilevel modeling and repeated-measures design. The researchers found that alcohol advertisement had a positive relationship with subjects ages 15-26. It was found that the relationship of alcohol advertisement had an event rate ratio of 1.01 at a 95% confidence interval. The 1.01 relationship translated into a 1% increase in alcohol consumption per month for every advertisement seen by the participants. The researchers also found that the more money spent on alcohol advertisement in the subjects' markets, the greater the increase in their monthly alcohol consumption. The relationship between money spent was a 3% increase in alcohol consumption for every dollar spent per capita in the given market

In a study conducted by Kuo, Wechsler, Greenberg, and Lee (2003), the researchers used the data sample from the 2001 College Alcohol Study. The sample included more than 10,000 students at 118 institutions. To examine the relationship between marketing and alcohol, the researchers conducted an assessment of the environment on and off the 118 institution campuses. Each institution was evaluated by breaking down alcohol establishments into on-site consumption (in which alcohol was purchased and consumed at the same location), and off-site consumption (alcohol was purchased and then consumed elsewhere). The on-site index examined the following: price; specials; promotions in the next 30 days; age verification; external and internal age requirement signage; exterior alcohol promotion; and interior alcohol promotion. The off-site index examined the following: liquid volume levels of beer sold; promotions;

alcohol warning signs; interior and exterior advertising; and other store variables. The observers evaluated approximately twenty-eight establishments per institution.

The variables for this study were as follows: college binge-drinking rates; high school binge-drinking rates; average number of drinks consumed per week during the last 30 days; on-site index scores; and off-site index scores. The index scores for each institution were averaged and compared to the average binge drinking rates using a Spearman rank correlation coefficient. The establishments that sold alcohol for off-site consumption results were as follows: the promotion of alcohol and the binge drinking rate were significantly correlated ( $r = 0.35, p < 0.001$ ). The interior and exterior advertisements were correlated, but did not have statistical significance; the researchers indicated that institutions that did not have alcohol advertising had a much lower rate of binge drinking. It was determined that institutions that had higher off-site establishment index scores had a higher rate of binge drinking ( $r = 0.39, p < 0.001$ ). The establishments that sold alcohol for on-site consumption results were as follows: the price of alcoholic drinks was found to have a significantly negative correlation with the rate of binge drinking rates. The results were as follows: single drinks ( $r = -0.36, p < 0.01$ ), pitchers ( $r = -0.25, p < 0.01$ ), and large volumes ( $r = -0.39, p < 0.0001$ ). That means that the lower the price of alcohol, the higher the rate of binge drinking.

Weekend specials on alcohol were also found to have a high correlation with the rates of binge drinking ( $r = 0.42, p < 0.0001$ ), which means that institutions with a high rate of weekend specials would have a higher rate of binge drinking. The overall index score was also found to significantly correlate to binge drinking ( $r = 0.42, p < 0.0001$ ). The authors concluded that having an understanding of the use of marketing by alcohol establishments could lead to better regulations, thereby reducing the levels of binge drinking on college campuses.

## Social Media

Communication between people once consisted of face-to-face interactions with another person, but technologies and changes in our lifestyles have evolved so that people are connecting with others across the globe. Today there are social networking sites for all types of groups and individual interests, all with the goal of connecting people to each other in the *virtual* world.

One of the largest social networking websites is Facebook. In 2004, Facebook changed the way society communicates and learns. According to the company's website, "Facebook's mission is to give people the power to share and make the world more open and connected" (Facebook, 2012). Yet prior to Facebook, there was Facemash which Mark Zuckerberg developed in 2003 while a student at Harvard. The site was an instant success and had hundreds of users across campus within hours but Mark Zuckerberg had not intended for this website to result in business venture. It is worth mentioning that at the time Facemash was launched Harvard did not have an online student directory, which may account for the viral-like spread of the site across campus. Mr. Zuckerberg, however, was cognizant of the reaction among fellow students and eventually left Harvard and officially launched the SNS Thefacebook (now known simply as Facebook) in 2004 (Campbell, 2010).

According to Golder, Wilkinson and Huberman (2007), social networking websites are: A class of web services that invites users to create an online profile of themselves, most commonly with a photograph, a listing of vital statistics (e.g. name, geographic location, sexual preference, occupation) and interests (hobbies, favorite books, movies, television programs, and so on). Most crucially, these services are focused on allowing users to list other users as 'friends,' thereby linking their pages to one another and publicly demonstrating their connection. (p. 2)

There are numerous uses for social networking websites with an individual having as much or little involvement with their page as they choose. Boyd and Ellison (2007) reported that internet-based social networks are:

According to a MySpace fact sheet (Alexa, n.d.), the site had more than 100 million global users and nearly 65 million in the United States. One method of measuring the use of a website is the time spent on it by a given population. According to Alexa (n.d.), the average time spent on Facebook is thirty-three minutes a day; this has increased from roughly twenty-one minutes a day from a year ago. The average time spent using MySpace, however, is sixteen minutes a day, which has decreased from an average of twenty-one minutes a day a year ago. Individuals use Twitter for about eight minutes a day. Twitter is an emerging technology that has not yet reached the popularity of Facebook, and MySpace is declining in usage; with this in mind, the researcher chose to focus this study only on Facebook because it had the highest ranking for viewership and the most time spent by users.

Users of Facebook can create their own profile page and include information about their academic history, employment, hometown, favorite quotes, movies, and music, along with personal hobbies. Other functions include creating and joining various groups of interest as well as uploading photos and videos with control over their privacy settings. Facebook's company timeline (see Table 2) demonstrates that the company has grown at an incredible rate through investment from private companies and the development of new software technologies. What is more, statistics from the corporate website revealed more than 250 million users with 120 million people logging into their account at least once a day (Facebook, 2009). Online activity includes over 2 billion photos and 14 million videos posted, and 3 million user events created. Each day, users spend 6 billion minutes on Facebook, and update their status 40 million times.

The rapid growth and use of social networking has allowed Facebook to become one of the most popular websites in the world.

Table 2

*Particular Points of Interest from Facebook's Company Timeline*

Date	Event
December 2011	Timeline launched worldwide
September 2009	300 million active users
August 2008	100 million active users
April 2008	Facebook launches Chat
March 2008	Facebook updates privacy controls
November 2007	Facebook launches Advertising
October 2007	50 million active users, launch Mobile Platform
April 2007	20 million active users, Site redesigned
March 2007	2 million active Canadian users and million active UK users
December 2006	12 million active users in U.S.
November 2006	Share feature added on over 20 partner sites
September 2006	News Feed and Mini-Feed added. Expands eligibility for users.
August 2006	Development platform launched, Notes app. introduced
May 2006	Adds work networks
August 2006	Development platform launched, Notes app. introduced
May 2006	Adds work networks
December 2005	5.5 million active users
October 2005	Photos app. added, international school networks launched
September 2005	Adds high school networks
August 2005	Name officially changed to Facebook from thefacebook.com
December 2004	1 million active users
September 2004	Groups app. added; Wall feature added
March 2004	Expands to Stanford, Columbia and
February 2004	Facebook launched from Harvard dorm residents Mark Zuckerberg, Dustin Moskovitz, Chris Hughes & Eduardo Saverin

*Note.* Source: Facebook (2013). Timeline. Retrieved from <http://newsroom.fb.com/Timeline>

In 2006, Interpublic acquired ownership interest in Facebook, amounting to approximately 0.5 percent of the social networking site's total shares. The interest was purchased for less than \$5 million; at the time, Facebook had fewer than 12 million users and trailed behind other social networking sites in popularity. Facebook sold the shares to Interpublic with the agreement that the company would develop \$10 million in marketing programs for its agency clients. In August 2011, Interpublic sold its shares of Facebook, yielding about \$130 million, a notable increase when compared to the original \$5 million for which the shares were purchased.

### **Facebook and College Students**

The popularity of Facebook among college students is demonstrated in a study by Golder, Wilkinson and Huberman (2007). Facebook communication was examined for 4.2 million students at 496 academic institutions in the United States over a two year period of 2004 to 2006. The results indicated that Facebook has become an everyday occurrence in the lives of college students and tends to mirror their daily schedules. The researchers also found that Facebook has become a common method of communication between students, and is a method by which to continue relationships, both local and distant.

Bugeja (2006), the director of the Greenlee School of Journalism and Communication at Iowa State University, conducted an informal review of the effects of Facebook in the academic setting. In the review, he found that roughly 78% of all the students at his university had and used Facebook accounts. To demonstrate the high usage of Facebook on college campuses, Bugeja describes a story of Professor Michael Tracey at the University of Colorado. In this story, Dr. Tracey was conducting a class discussion, and asked his students how many people had watched PBS the night before. He recalled that not many students answered yes, but one student replied, "Ask how many people used Facebook." Therefore, Dr. Tracey asked his students and

all 140 replied yes. Dr. Tracey then asked how many of his students had used Facebook that day; again, all students replied yes. Facebook provides students with an opportunity to communicate with peers and invite them to social events that may involve the use of alcohol.

Pempek, Yermolayeva, and Calvert (2009) examined college students use of Facebook, in particular the amount of time students spend on social networking sites, their purpose for using them, and the way(s) in which they used them. As part of the research project, students kept a log on the number of minutes spent each day on Facebook over the course of a week and what activities they engaged in while on the SNS.

The results showed the most common activities included sharing photos, viewing photos of other users, writing on the walls of other users, reading posts on their own wall as well as comments posted on the walls of other users. Students' daily use of Facebook during the week ranged from 2 to 117 minutes, with some reporting no Facebook activity on the weekend use to over 165 minutes. The average time each day during the week was 27.9 minutes, with a slightly higher weekend average of 28.4 minutes a day. Nearly all of the students (93%) reported logging on in the evening between 9 p.m. and midnight, with slightly less (80.4%) indicating they were on Facebook from 6:00 p.m. to 9:00 p.m. The majority of students (85%) revealed their primary reason for using Facebook was to keep in touch with friends they saw every day as well as less frequent. Students also reported using Facebook for fun, as a break from their work, and to keep from being bored (Pempek et al., 2008).

Regarding the types of personal information commonly shared on Facebook, Pempek et al. (2008) found that students most often posted information about music, movies or books that they liked with "nearly every student (96.7%) reported that their college was their 'primary' network" (p. 233). What is more, the authors found that overall, most students allowed open

access to their personal information on Facebook. Posting photos was a more common activity among females than males, yet women were more apt to “untag” photos (remove their name from another member's photograph on which the member had added their name)” (p. 233), with the most common reason for this being dissatisfied with how they looked (89%). While men also removed themselves from others photos based on their looks (57%), 35% revealed they untagged because the “photos depicted them engaging in an act that they did not wish for others to see, such as underage drinking” (p. 233).

Wiley and Sisson (2006) examined the use of SNS among college students and found that 91% of respondents use the social networking site Facebook. In a study conducted by (Ellison, Steinfield, & Lampe, 2007), college students in the United States reported using Facebook approximately 10 to 30 minutes each day. Ellison et al. (2007) reported that students used Facebook primarily to interact with acquaintances and maintain friendships, not necessarily to make new friends.

### **Alcohol Promotion and Social Media**

In the last 5 years, social networking platforms such as Facebook, Twitter, and YouTube have emerged as major players in alcohol marketing campaigns. The frontrunner, Facebook, has more than 400 million active user accounts (Facebook, 2010a). Mart (2011) recently noted:

Facebook offers ad space that companies can purchase to advertise alcohol products, sponsored events, and brand-related content. Facebook also offers other opportunities such as fan pages to promote products; event pages to invite users to sponsored parties, contests, or other events; applications made by third-party developers to play games and interact with other users; and pages where users can create their own groups of users and communicate with them. (p. 890)

An online search for alcohol on Facebook (2009) resulted in over 500 groups related to binge drinking, more than 500 groups related to alcohol, and over 500 alcohol-related current events. Moreover, there were 74 Facebook pages and 54 applications related to the consumption of alcohol. The largest group related to the consumption of alcohol on Facebook was “Alcohol Improves my Foreign Language”. At the time, the group had 149,974 members, 232 active group discussions, 5,287 wall posts, 773 photos of alcohol and had a group description that referred to individuals having the ability to master a second language after the consumption of a few drinks. The most popular Facebook page associated with alcohol was “Alcohol”. The group had 664,409 fans and a mission statement that indicated alcohol was a best friend (Facebook, 2009).

One of the most popular alcohol-related applications on Facebook was “Pass a Drink.” The application had 1,496,374 users and allows others to virtually pass drinks to fellow members. The users are then able to consume the drinks and measure their levels of intoxication. Searching the site using the term binge drinking revealed over 500 groups, 307 current events, 37 dedicated pages, and one application. The largest page associated with binge drinking on Facebook was “We Love to Binge Drink”. The group had 10,490 members, 16 active discussions, 232 wall posts, and using profanity described the virtues of binge drinking. The largest page dedicated to alcohol and binge drinking was “Binge Drinking Association.” The group had 152 fans along with videos and photos that make light of intoxication and mass consumption of alcohol (Facebook, 2009).

Watson, Smith, and Driver (2006) conducted a study on the prevalence of alcohol, illegal activities, and sex on college students’ Facebook pages. To determine the level of these activities displayed on students’ Facebook pages, the researchers analyzed the central photos of 150 students at 50 universities. A central photo refers to the user’s profile photo, which can be

viewed by all other Facebook users. After the 150 subjects were randomly selected, the researchers printed out the central photos for each subject and assigned it a random number. The photos were then analyzed and examined, using an inventory rating scale developed by the researchers. The study found that 9% of the central photos involved alcohol, 2.7 % of the photos were sexually suggestive, and 0.7% contained partial nudity. This study used a narrow lens to focus on the central photos of college students; the researchers did not examine other aspects of their Facebook pages, such as photo albums, wall posts, applications, fan pages, and groups. The study demonstrated that even when using such a narrow scope, alcohol and other questionable acts were able to be found (Watson et al., 2006).

The display of alcohol on social networking websites such as Facebook is often associated with negative consequences, and as a result, is publicized in numerous media sources. Since the inception of social networking websites, the media has provided sensational articles that illustrate the negative ramifications of the combination of alcohol and social networking websites. In a recent document published by Hasting and Angus (2009), the researchers noted that advertisement for alcohol on Facebook and other Internet-based technologies has become a problem and requires tougher regulations by the British government. This document demonstrates that medical professionals have an understanding that Facebook and other social networking websites are outlets for mass dissemination of alcohol information. According to an article by Alleyne (2008), a coastal town named Torbay in the southeastern portion of the United Kingdom enacted a town-wide ban on the sale of alcohol for one weekend due to a Facebook party that had been scheduled at the local beach. The party had over 7,000 registered guests planning to attend, and was listed as a night of mayhem. The location and the time of the event would not be released until hours prior to the event. Local officials believed that this would

cause great harm and problems for the community.

In the United States, there is also an effort underway to discourage the display, glorification, and excessive use of alcohol. In a student newspaper for Kennesaw State University, an article was published that highlighted the connection of Facebook to the consumption of alcohol. In this article, published by Richmond (2008), a local Mexican restaurant that was frequented by students had its liquor license revoked due to photos that emerged on Facebook. The photos in question that were posted on Facebook illustrated staff serving alcohol to underage drinkers. According to Hamilton (2008), a Facebook event surrounding the ban of alcohol consumption on public transportation was to blame for destruction and injuries. The event was coordinated and promoted through Facebook; over a thousand registered guests planned to attend. The event closed six tube stations, and nine public workers were assaulted.

In recent years, inappropriate conduct on Facebook has been brought to the attention of university officials. These issues on social networking websites have created a new set of concerns for universities. According to Anderson (2005), Penn State students posted photos of their friends rushing the field after a victory over the Ohio State football team. On the day of the event, authorities only made two arrests, but due to photos posted on students' Facebook pages, Penn State University Police Department found a large number of students who committed the illegal act of rushing the field at the sporting event.

Misconduct on Facebook is not limited only to sporting events. In an article written by Cariccisoso (2006), the author discussed an incident that occurred at Syracuse University, in which three girls created a Facebook page for their English professor. On the page, the students made disparaging and sexually explicit comments about the professor. After university officials

found the comments, the students were sternly disciplined.

Gianoni (2006) revealed that administrators of colleges and universities in the United States are starting to use Facebook.com as a means of cracking down on underage drinking and other potential problem activities (Gianino 2006). In particular, Gianino identified the University of Missouri's creation of a department a new department called the Facebook Task Force at the University of Missouri. This department was created to conduct background checks on students applying for on-campus jobs; during the researching of prospective student workers, the task force found many possible disciplinary opportunities. Later in the article, the author brings up an incident in which two students at Fisher College were expelled for making threats on Facebook to commit crimes, and four students at North Carolina State University were disciplined due to posts of their underage drinking on Facebook. The new attention given to Facebook by universities has brought to light alcohol issues that might not have been recognized previously.

Facebook has changed the way students communicate, divulge personal information, develop and maintain social relationships, and form their beliefs about fellow classmates. According to Eberhardt (2007), Facebook has changed the way students communicate and form opinions. Facebook allows students to function in an online environment and act in a negative fashion, posting material and/or comments that they would not divulge in person. The author goes on to state that this information posted on Facebook might lead students to judge their peers negatively. This idea of judging one's peers through the use of online social networking websites is further explored by Farrell (2006) and Millar (2007) who examined the use of Facebook by incoming first year students. The authors found that students were using Facebook as a method of determining the likelihood that they would get along with their roommate.

One issue that has changed with the inception of online social networking websites is the openness in which individuals share information. Gross and Acquisti (2005), examined 4,540 Carnegie Mellon university students' Facebook pages looking for personal information disclosed and privacy settings. The subjects for this study were selected by conducting a search for both male and female students in the Carnegie Mellon network using Facebook's built-in search tool. The researchers found that 89% of users listed their actual name, 90.8% of the profiles contained images of the individuals, 87.8% revealed their birth date, 39.9% listed their phone numbers, and 50.8% listed their residence. The study also found that a small number of subjects changed their privacy settings. In fact, only 1.2% of the subjects changed the search option to restrict being searched by everyone on Facebook; only 0.06% of the subjects opted to restrict access by users in the Carnegie Mellon University network. These findings allowed the researchers to conclude that the personal information provided on Facebook is shared through a network of friends, and can allow strangers to access the personal life of students. The nearly unrestricted access to students' information led the researchers to conclude that students are putting themselves at risk of stalking, physical attack, and personal attacks. One possible adverse effect of students' increased sharing of information is risking their future professional career. Even the jobs students get after college can be influenced by the use of Facebook. Both Elzweig and Peeples (2009) and Roberts and Roach (2009) recently reported that employers are now using Facebook as a tool to research the applicants and even the retention of current employees.

Lampe, Ellison, and Steinfield (2006) examined how students were using Facebook for social searching and/or social browsing. The sample for this study consisted of first year students at Michigan State University. The data was obtained through a web-based survey in the fall and spring semester that collected information regarding basic demographics, Facebook usage, and

reasons for using Facebook. To assess why students used Facebook, the researchers used a 5-point scale to determine how likely the students were using the website for a given purpose. The closer the answers were to five, the more likely students were using Facebook for that particular purpose. 1,440 participants responded in the fall, and 1,085 students responded to the follow-up survey. The results for the study indicated that students who used Facebook as a method of researching the profiles of someone they met had a mean score of 4.63; using Facebook to gain information about other people in their environment, such as dorm mates, had a mean score of 4.00; researching classmates had a mean score of 3.65; researching fraternity members had a mean score of 4.00; and researching sorority members had a mean score of 4.00. The researchers believe that these results indicate that students are using Facebook as a tool to increase the understanding of students in their offline environment (Lampe et al., 2006).

In the new era of web-based technologies, even universities themselves are being affected by social networking websites. According to Hechinger (2008), universities are now using Facebook as an admissions tool, and students are being rejected based on the content found on their profiles. Hechinger went on to say that, of the 320 admission officers interviewed, approximately 10% stated that they used Facebook as a tool of assessing possible applicants, and of those using Facebook, 38% indicated that they found negative materials. In an article written by Barnes and Mattson (2007), universities are becoming more familiar with and adapting to the use of social networking websites. The researchers looked at 453 admissions departments in 49 states. The findings indicated that 55% of the universities were familiar with the use of social networking websites, 88% felt that their use was important, and approximately 21% are now using websites such as Facebook as tools to research students prior to the admission process.

## **Summary**

The current literature demonstrates that unhealthy consumption alcohol is one of the largest concerns facing universities today. While there have been a number of research studies conducted to investigate social and environmental factors that influence students' consumption of alcohol, the usage of Facebook is not yet one of them. The review of literature also demonstrated that the usage of Facebook has increased exponentially and allowed for the open display of alcohol content. The virtual display and advertising of alcohol events has increased and led to a number of real life issues. Chapter three will provide an overview of the methodology for this study, instrument design and data collection, and analyses methods.

## **CHAPTER 3**

### **METHODS**

#### **Overview**

This chapter will summarize the methodology used to conduct this study. In this chapter the purpose of the study, research design, research questions, sample, a description of the instruments, the data collection procedures, and statistical analysis will be outlined.

#### **Purpose of Study**

The purpose of this study was to investigate whether college students' use of the social networking site Facebook influenced their alcohol consumption. In particular, the relationship between students' alcohol use and exposure to alcohol-related content through various features or activities on Facebook was examined. An additional focus was to identify whether certain variables increased the chances of predicting students' alcohol and Facebook use.

#### **Research Questions**

1. What is the relationship between students' alcohol consumption and Facebook use?
2. What is the relationship between students' alcohol consumption and invitation to alcohol-related parties, exposure to alcohol-related advertisements, groups, photos, fan pages, applications or wall posts on Facebook within the last 30 days?
3. To what extent can students' sex, rank, age, employment status, enrollment, or GPA predict their Facebook use?
4. To what extent can students' sex, rank, age, employment status, enrollment, or GPA predict their alcohol consumption?

## Research Design

The study employed a non-experimental, quantitative, descriptive and correlational research design to examine the relationship between students' alcohol consumption, Facebook use, and exposure to alcohol-related content through various applications or features on Facebook. Meadows (2010) indicated that research designs are “the framework used to conduct research [whereas] research methods are data collection techniques” (p. 2). Johnson (2001) noted that “nonexperimental quantitative research is an important area of research for educators because there are so many important but nonmanipulable independent variables needing further study in the field of education” (p. 3).

Knupfer and McLellan (1996) revealed that “descriptive studies often yield significant results that can lead to important recommendations among researchers” (p. 1198). Isaac and Michael (1995) added that through descriptive studies, researchers are able to “systematically describe a situation or area of interest factually and accurately” (p. 46). Relationship designs describe the association between two or more variables. A correlational design involves an assessment of predictive relationships among multiple variables. This type of design is intended to assess whether variables relate to one another and, if so, to what extent. Gall, Gall and Borg (2006) indicated that correlational designs are frequently used when the variables under study cannot be manipulated. These authors added that if the purpose of the study is to understand the strength of the relationship between these variables, correlational research is appropriate.

A correlational design was used in this study to examine the relationships between students' Facebook use and self-reported alcohol consumption. This design supported the use of multiple regression design and analyses, as the emphasis was measuring the strength of the relationship between several independent or predictor variables on a single dependent or criterion

variable (Knupfer & McLellan, 1996). This design was appropriate for this project as it allowed the researcher to examine the predictive nature of several demographic (independent) variables on two separate criterion variables, students' Facebook use and alcohol consumption.

### **Study Sample**

The population for this study was college students' ages 18-24 attending a mid-size public university located in the Midwestern region of the United States. The institution was fully accredited by the Higher Learning Commission-North Central Association of Colleges and Schools. Only undergraduate students enrolled in the university at the time of data collection were eligible to participate in this study. The institution's enrollment data revealed 15,980 undergraduate students 18-24 years of age attended the university (SIUC, 2008). This institution was selected because of the researcher's affiliation with the institution as a doctoral student, geographical proximity of the researcher to the institution, and permission to solicit participants who met the study criteria.

A non-probability sampling strategy was employed for this study. Non-probability is selection based on the researcher's judgment or convenience. The sample was obtained by soliciting participation from students who met the study criteria and passed through the university student center during the timeframe that data was collected. This sampling method was deemed appropriate as the researcher only generalized results to the population covered in the survey. What is more, this type of research is useful for studies like this to generate ideas for future research.

Hill (1998) indicated that the minimal sample size for a descriptive study employing a population size of 15,000, using a confidence interval of 95% and a sampling error of +/- 5%, was 375 students. This was confirmed using Krejcie and Morgan's (1970) sample size table.

However, the study's purpose focused on correlation and prediction through multiple regression analyses, therefore additional sources were consulted for the appropriate sample size. Miles and Shevlin (2001) indicated that studies using regression analysis be comprised of more than 100 participants or 20 participants for each independent variable to be used. Following these recommendations, oversampling was used to ensure adequate data was obtained to compute the study statistics. This resulted in 502 completed surveys for inclusion in the data analysis.

### **Instrumentation**

The survey instrument used in this study was designed by the researcher, for the primary purpose of soliciting college students' self reported rates of alcohol consumption, Facebook use, exposure to alcohol-related content on Facebook and reported alcohol and Facebook use among other college students on campus (Appendix A). Several items measuring students' alcohol use were modeled (with permission, See Appendix B) after items on the Core Institute's Alcohol and Drug Survey - Long Form. This survey has been used extensively to measure students' rates of tobacco, alcohol, marijuana, cocaine, amphetamines, sedatives, hallucinogens, opiates, inhalants, designer drugs, steroids, and other illegal drugs and other drugs over various periods of time. Of these, only alcohol specific questions were pertinent to this study resulting in the modification of items and response options soliciting student's alcohol use.

The demographic questions (1-10) were the same as those used on the Core Survey – Long Form. Question 11 on the existing survey was the first item modified from the Core Survey – Long Form. The corresponding Core survey question (No. 14) originally asked students to “Think back over the last two weeks. How many times have you had five or more drinks at a setting?” with the following response options: (a) None, (b) Once, (c) Twice, (d) 3 to 5 times, (e) 6 to 9 times, and (f) 10 or more times. This question was revised for this study as follows:

“Think back over the last two weeks. How many times have you had 5 or more drinks (male) or 4 or more drinks (female) in a two hour sitting?”

The first difference was the use of the 5/4 definition of binge drinking for males and females followed by an open response option for students to enter a number on their choice. This was done to obtain students’ self-reported rates of binge drinking without the restrictions of the categories used on the Care survey. Question 12 in this study asked: “What is the average number of drinks consumed in a week?” Students entered the number of alcoholic beverages that best reflected their weekly use. This was modified from item 15 on the Core survey which stated “Average # of drinks you consume a week”. Participants reported their mean weekly drinks by filling in the corresponding number(s) on the scantron sheet that allowed responses to range from zero to 99.

Question 13 on the final instrument was developed by the researcher asking students’ to report what number best represented the average number of alcoholic drinks consumed in a day. This was added for comparison with a subsequent item requesting students’ hours on Facebook each day. Questions 14 and 15 were added by the researcher soliciting students’ average number of days they used Facebook in a week and the average number of hours they used Facebook in a day. These items were added to align with the research showing students’ time spent on Facebook has typically been measured by the number of days each week and hours per day (Ellison et al., 2007; Moreno et al., 2012; Steinfield et al., 2008).

Question 16 on this survey asked students, “During the past 30 days, on how many days did you use alcohol?” and was modeled after the Core survey question 18 soliciting students’ use of alcohol and other drugs in the last month. The original wording was, “During the past 30 days on how many days did you have: with students provided 11 different substances including *other*

*illegal drugs*. For each of the substances presented with this question response options forced students to choose, (a) 0 days, (b) 1-2 days, (c) 3-5 days, (d) 6-9 days, (e) 10-19 days, (f) 20-29 days or (g) all 30 days. The researcher revised the response option allowing students to enter the number of days. Question 17 on the final instrument also was developed by the researcher to solicit students number of days within the last 30 they used Facebook. This was done to allow for comparison of students self-reported rates of alcohol with Facebook over the same period of time.

Question 19 on the Core Survey asked students to report the behaviors of other students use of alcohol and drugs (same as question 18) with the response options, (a) Never, (b) Once a year, (c) 6 times/year, (d) Once/month, (e) Twice/month, (f) Once/week, (g) 3 times/week, (h) 5 times/week, and (i) every day. For this study, the items 18-22 solicited students' perceptions of other students' alcohol consumption and Facebook use. The open-ended response option was used for these questions to maintain consistent reporting process. Question 23 asked students to select the device most commonly used to access Facebook with response options as follows: None, Desktop computer, Laptop/Netbook, Cell phone, or Handheld device (e.g. iPod Zune). Survey question 24 asked students to report whether or not they participated in extra-curricular activities.

Additional items were developed by the researcher requesting students to report the number of times in the last month they saw the promotion of alcohol on Facebook through (a) invitations to parties, (b) alcohol advertisements, (c) Facebook groups, (d) photos, (e) fan pages, (f) applications, and (g) wall posts. For each category students wrote in the number of times that represented their rates of exposure on Facebook. The two final items on the final instrument were developed by the researcher soliciting (#31) whether they felt their use of Facebook affected

their alcohol consumption and (#32) whether students felt their use of Facebook affected other students' alcohol use.

### **Reliability and Validity**

Once Human Subjects approval was obtained from the researchers' institution to conduct the study, steps were taken to establish the reliability and validity of both the cover letter and final instrument used in this study. Establishing the instruments psychometric properties was important to confirm that the outcomes obtained were accurate and valid (Agarwal, 2011). A panel of experts was consulted to evaluate the survey items and provide support showing evidence of content validity with the final questionnaire. The panel members had expertise in survey research and design, health education (specifically alcohol use among college students) and social networking use among college students.

The panel was asked to review both the cover letter (Appendix C) and proposed survey documents for these purposes. To assist them with their review, the researcher provided each member with a document containing several questions regarding their final assessment (See Appendix D). This was accompanied by the cover letter and survey for each panel member to review and return to the researcher with their feedback regarding these documents. The results of the expert review indicated that no changes were necessary, and therefore the cover letter and instrument were deemed appropriate for use in this study.

### **Pilot Test**

Monette et al. (2002) indicated that an important aspect of data collection is the pilot study in which “. . . a small-scale trial run of all the procedures planned for use in the main study” (p. 2). The pilot study for this research project was conducted in the fall semester of 2009 to test the data collection procedures and internal consistency of the final instrument. The pilot

sample was comprised of undergraduate college students, ages 18-24, similar to the study population. Verbal permission was obtained by the department director to approach instructors of the introductory health class to conduct the pilot test using students enrolled in their classes.

The researcher set a required number of 85 surveys be completed and returned for the pilot study. Each instructor was approached by the researcher to discuss the purpose and nature of the dissertation project and request permission to conduct the pilot study in their classes for subsequent data analysis. Three instructors consented and plans were made for the researcher to collect the pilot data during the second week of the fall semester 2009. Arrangements were made for the researcher to attend the three sections and explain the nature of the study and solicit their written permission to participate. It was reinforced that participation was completely voluntary and that they would not be subjected to any negative consequences if students chose not to participate.

Students who participated were given a consent form to sign and return to the researcher (Appendix E), after which they received a copy of the cover letter to review and survey for completion. The questionnaires were collected as students finished and sealed in an envelope, with the class section number the only identifying factor written on the front. This process was followed for all three sections with a total of 85 surveys submitted, after which they were examined to ensure they were completed in their entirety. Five questionnaires were eliminated as they were missing data for survey questions 11-17 and 25-31, as these items were identified by the researcher as necessary to answer the questions under study. Each of the completed surveys was discretely numbered from 1 to 80, in order to facilitate the validation of the data entry process. A coding scheme was devised for each demographic item with the variables and response codes provided in Table 3.

Table 3

*Coding Scheme for Demographic Variables*

Item #	Response options	Coding/scale
1. Rank 0 = absent, 1 = present	Freshman (0, 1) Sophomore (0, 1) Junior (0, 1) Senior (0, 1) Non-degree seeking (0, 1)	Categorical
2. Age	Whole number	Continuous
3. Race	1 = American Indian 2 = Asian/Pacific Islander 3 = White 4 = Black 5 = Hispanic	Categorical
4. Married	1 = Single 2 = Married 3 = Separated 4 = Divorced 5 = Widowed	Categorical
5. Sex	1 = Male 2 = Female	Categorical
6. Housing	1 = On-campus 2 = Off-campus	Categorical
7. Employed	1 = Yes 2 = No	Categorical
8. Credits	1 = Part-time 2 = Fulltime	Categorical
9. GPA	4 = A 3 = B 2 = C 1 = D	Categorical
10. Citizen	1 = In-state 2 = Out of state 3 = Other country	Categorical

Dummy coding was used for the predictor variable “rank”, in order to be included in the multiple regression analysis. Power and Xie (2008) noted that “categorical independent (or

predictor) variables can be easily handled in a regression model by creating dummy variables to represent the different groups. The dummy variable takes a value of “1” when an attribute was present, and “0” otherwise” (p. 23).

The data from the pilot surveys were entered by hand by the researcher, with specific attention taken with matching the numbers on the paper copy of the questionnaire with the line in the database. The entire set of responses was entered for each survey before moving on to the next, until all of the data was entered. The information was then checked for accuracy by a second person, who assisted the researcher by reviewing the data corresponding to each numbered questionnaire. No inaccuracies were identified and dataset was uploaded into the Statistical Package for Social Scientists version 19.0 (SPSS, 2010) for analysis. Descriptive statistics were computed to evaluate the distribution of the data and establish the internal consistency of the questionnaire. The results of the reliability analysis indicated a Chronbach’s alpha of .77, which was sufficient for data collection procedures to proceed (Babbie, 1992)

### **Data Collection**

Data collection took place from January 21-31, 2010, in the participating institutions student center. School administrators indicated that this building was suitable for this study as it was visited by roughly 10,000 students each day (L. Stettler, personal communication, November 10, 2008). Prior to data collection, 575 copies of the survey were duplicated and discretely numbered from 1 to 575 to allow the researcher to track of the total number of surveys returned each day and for data entry upon completion.

A table was placed at the main entrance of the building with participants provided a place to stop and complete the survey instrument. As students entered the student center they were approached by the researcher and asked if they would be willing to participate in the study.

Those students who were interested were asked two screening questions confirming they were active enrollment status and their ages were between 18-24 years old. For those students who answered yes to both questions, copies of the cover letter and official consent form were provided for them to review. Pens were available for students to sign and return their consent form to the researcher (Appendix F). At that time, each participant was given a paper copy of the survey instrument to fill out, with directions to place their completed surveys in a large envelope on the main table that was monitored by the researcher.

An incentive was provided to all students who returned a completed survey, with the option to enter a drawing to win one of three iPod Shuffles. Students were given a raffle ticket with a unique number on two sections and told write down their contact information on the portion to submit. Students placed one-half of their ticket in a sealed box maintained by the researcher and informed that the drawing would take place as soon as data collection was completed. At the end of each day the envelope with the surveys was sealed and along with the box taken to the home of the researcher for safe keeping. For security the sealed envelopes containing the completed questionnaires were securely locked in a filing cabinet each night.

This process was followed until 550 surveys were submitted, at which time data collection was completed and the winners of the iPod Shuffles selected. Three names were randomly chosen from the tickets in the sealed box after which the researcher contacted the winners and made arrangements to claim their prizes. The winning tickets were placed back in the sealed box and were burned by the researcher to protect anyone from accessing the participant's personal information.

### **Data Entry**

Each envelope containing the questionnaires was opened stacked in numerical order, at

which time the researcher reviewed each one to ensure they were completed. Of the 550 surveys submitted 48 were discarded because they were missing information, resulting in the data from 502 students to be used in the final data analysis. The elimination process required the surveys to be renumbered, with each one identified from 1-502 for data entry.

Prior to the final data entry an Excel spreadsheet was prepared with each item on the instrument listed and set up so that each line would represent the responses from each study participant. The numbered surveys were separated into five stacks of 100, with the exception of the last which had 102 questionnaires. The researcher planned to enter the data from 100 surveys each day with a 10% verification plan deemed acceptable to validate the information entered at the end of the day (McDermott & Sarvela, 1999; Van den Broeck, Argeseanu Cunningham, Eeckels, & Herbst, 2005).

The surveys representing the data that had been entered that day were stacked in numerical order ranging from lowest to highest. To start the validation process a survey was randomly selected from the stack after which the answers on every 5th instrument was compared to the corresponding number in the database for accuracy. A 95% accuracy rate was set as the goal for data entry until completed (McDermott & Sarvela, 1999; Van den Broeck, Argeseanu Cunningham, Eeckels, & Herbst, 2005). The final data was uploaded into the Statistical Package for Social Sciences (SPSS) version 19.0 and prepared for final analyses.

### **Data Analysis**

The data on this survey was used to determine whether there was a correlation between participants Facebook Use or exposure to alcohol-related content while on Facebook and their Alcohol Use. Trochim and Donnelly (2007) indicated that the results of the analysis produced a correlation coefficient which is “a single number describing the degree of relationship between

two variables” (p. 268). The Spearman Rank Correlation Coefficient (also known as Spearman Rho or Spearman  $r$  correlation), can range in values from -1.0 to +1.0 with a coefficient of zero indicating no relationship between the two variables under study. The closer the coefficient is to 1.0, the stronger the relationship, (negative or positive) is between the two variables being examined. A significant correlation indicates that the scores on the two variables tend to change together, but does not provide the underlying reason or cause for this change (Choudhury, 2009).

Spearman’s Rho (denoted as  $r_s$ ) was computed to identify whether there were significant relationships between students exposure to alcohol through various functions or aspects of Facebook and their reported alcohol use. Separate multiple regression analyses were computed to identify whether students’ age, rank, GPA, credit hours, or employment status were significant predictors of student’s Facebook Use and Alcohol Use. Neutens and Rubinson (2002) noted “multiple regression is a technique that determines the correlation between a criterion variable and a combination of two or more predictor variables” (p. 281). Multiple regression analyses allow researchers to understand the strength of the relationship between the predictor variables and the criterion variable under study. Isaac and Michael (1995) added that multiple regression analysis was used “to determine the degree of relationship given by an index number know as the multiple correlation coefficient between a continuous criterion measure (dependent variable) and an optimally weighted combination of two or more predictor (independent) variables that are usually continuous” (p. 210). All of the variables were entered into the regression model at one time through the default “enter” method. The summary of the data analysis procedures for each research question is presented in Table 4.

Table 4

*Summary of Data Analysis by Research Question*

Research Questions	Survey Items/Factor	Analysis
1. What is the relationship between students' alcohol consumption and Facebook use?	Facebook Factor Alcohol Factor	Descriptive statistics Spearman Rank Correlation Coefficient
2. What is the relationship between students' alcohol consumption and invitation to alcohol-related parties, exposure to alcohol-related advertisements, groups, photos, fan pages, applications or wall posts on Facebook within the last 30 days?	Alcohol Factor Qs 25-31	Descriptive statistics Spearman Rank Correlation Coefficient
3. To what extent can students' sex, rank, age, employment status, enrollment, or GPA, predict their Facebook use?	Criterion: Facebook Factor Predictor: 1, 2, 7-9	Descriptive statistics Multiple Regression
4. To what extent can students' sex, rank, age, employment status, enrollment, or GPA, predict their alcohol consumption?	Criterion: Alcohol Factor Predictor: 1, 2, 7-9	Descriptive Statistics, Multiple Regression

## **CHAPTER 4**

### **RESULTS**

#### **Overview**

This chapter presents a review of the descriptive and inferential statistics including sections on the purpose of the study, demographic data of study participants, findings relevant to each research question, and a summary. This section will provide a summary of the study's data, including demographic data of all participants, data applicable to each research question, and a summary.

#### **Purpose of Study**

The purpose of this study was to investigate whether college students' use of the social networking site Facebook influenced their alcohol consumption. In particular, the relationship between students' alcohol use and exposure to alcohol-related content through various features or activities on Facebook was examined. An additional focus was to identify whether certain variables increased the chances of predicting students' alcohol and Facebook use.

#### **Participants**

The population for this study was college students ages 18-24, attending a midsized, public, 4-year degree granting institution in the Midwest region of the United States. The final sample was 502 students, 18 to 24 years old, of which 301 (60%) were males and 201 (40%) were females. The majority were 20-21 years old (41.8%,  $n = 210$ ) with approximately half of the students over the legal drinking age of 21 years old (49.3%,  $n = 250$ ). Data on the participants' race revealed that 329 (65.5%) were White/Non-Hispanic, 99 (19.7%) Black/Non-Hispanic, 31 (6.2%) Hispanic, 18 (3.6%) Asian/Pacific Islander, 6 (1.2%).

The majority of respondents were at least juniors (50.6%, n = 254) with only 89 (17.7%) students indicating they were freshman (17.7%, n = 89). Overall, students were single (92.8%, n = 466), lived off campus (63.5%, n = 319), and had a 3.0 (B) grade point average (67.3%, n = 338). Roughly half of the participants were employed (50.2%, n = 252) and enrolled either part-time (n= 255, 50.8%) or (n = 247, 49.2%) fulltime. More than 80% (n = 405) reported their permanent residence as in state.

### **Initial Results**

The descriptive statistics for items soliciting students' rates of alcohol consumption are presented and include the data comparing students' responses against that of their peers for items that are similar. This is followed by the participants reported rates of Facebook use with other students' usage reported together as well. Table 5 shows the students' self-reported rates of binge drinking (for females, males and total group) with the participants' perceived binge drinking rates for others students' on their campus.

Table 5

*Participants Reported Rates of Binge Drinking Compared to Their Perceived Rates of Binge Drinking for Other Students on Campus.*

No. Times	Students' Use (%)			Other Students' Use (%)		
	Female	Male	Total	Female	Male	Total
None	58.7	45.8	51.0	3.5	4.3	4.0
1 time	13.9	16.3	15.3	3.5	6.0	5.0
2 times	11.9	16.6	14.7	10.4	12.6	11.8
3-5 times	10.9	15.6	13.7	41.3	44.2	43.0
6-10 times	5.3	4.5	5.0	30.8	26.6	28.3
11 + times	>1.0	>1.0	>1.0	10.4	6.3	8.0

*Note.* N = 502.

The data revealed that 51% of the participants (n = 256) indicated they did not binge drink two weeks prior to completing the survey with 118 of these non-drinkers female and 138 males. One occurrence was noted by the highest number of students who binge drank (15.3%), yet the data show that the responses were spread out relatively even for up to five times in the last two weeks. An interesting finding showed that 43% of participants in this study believed that other students binge drank 3-5 times in comparison to only 13.7 of students who revealed themselves drinking at this same rate. Students were asked, "What is the average number of drinks you consume in a week?" with the results provided for both females and males in Table 6.

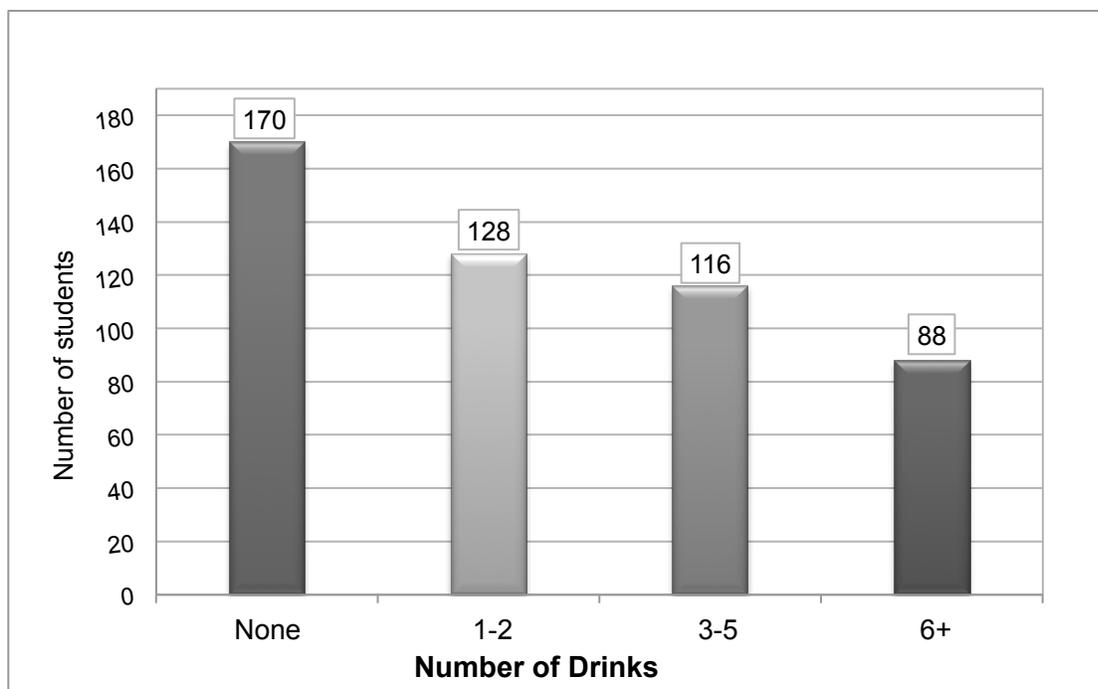
Table 6

*Number of Drinks Students Consumed a Week by Gender.*

No. Drinks	Female		Male	
	N	%	N	%
None	91	45.3	96	31.9
1-2	41	20.4	48	15.9
3-4	19	9.5	27	8.9
5-6	21	10.4	28	9.3
7-8	10	5.0	17	5.6
9-10	14	7.0	38	12.6
11+	5	2.5	47	15.6

*Note.* Sample size for females (N = 201), and males (N = 301).

The results revealed that 45.3% of females (n = 91) and 31.9% of males (n = 96) indicated that they did not drink alcohol in the week prior to data collection. However, of those who did drink, 1-2 drinks were the most common response reported by both males and females in this study. Figure 1 presents the average drinks consumed by students the last time they drank alcohol.



*Figure 1.* Students reported number of drinks if and when they consumed alcohol (N = 502).

As the data show, 170 students indicated that they did not drink alcohol. Yet of those who did drink, 25.5% (n = 128) reported drinking 1-2 alcoholic beverages the last time they partied. Roughly 23% (n = 116) indicated that the last time they drank alcohol, they consumed on average 3-5 drinks. Table 7 shows data on students reported number of days in the last month they drank alcohol with the same information they identified on their survey for their classmates during this same period.

Table 7

*Percentage of Participants and Number of Days in the Last Month They Drank Alcohol Compared to the Same Rates of Use Among Other Students on Campus.*

No. days	Students' Use (%)			Other Students' Use (%)		
	Female	Male	Total	Female	Male	Total
Did not drink	36.3	24.9	29.5	>1.0	>1.0	>1.0
1-2 days	16.0	14.6	15.1	1.0	>1.0	>1.0
3-5 days	20.9	21.6	21.3	6.5	10.3	8.8
6-9 days	13.4	17.3	15.7	16.4	17.3	16.9
10-19 days	10.9	16.6	14.3	49.8	50.8	49.0
20-29 days	2.7	4.7	3.8	20.9	19.3	19.9
Daily Use	>1.0	>1.0	>1.0	5.0	4.0	4.4

Roughly 30% (n = 148) of students indicated that they had not drank alcohol in the last 30 days, contrary to only 1% who reported the same rates of nondrinking for other students on their campus. Twenty-one percent of students indicated that they drank on average 3 to 5 days within the last month, with no significant difference in rates of use found by gender (21% females and 22% males). What is notable is that 49% of participants reported their peers' drank 10-19 days in the last month, much higher than what they revealed for themselves.

When asked what participants thought was the number of days per week other students drank alcohol, the majority (51%) remarked 3-4 days for their peers. Only 1% (n = 7) reported no alcohol use for other students on their campus, with daily alcohol use for other students noted by 10% of students surveyed. Participants were then asked to report the average number of days per week they used Facebook as well as the same rates of use for other students on their campus with the results presented in Table 8.

Table 8

*Percentage of Students and Number of Days on Facebook Each Week Compared to the Reported Use Among Other Students on Campus.*

No. days	Students' Use (%)			Other Students' Use (%)		
	Female	Male	Total	Female	Male	Total
None	7.0	7.0	7.0	>1.0	>1.0	>1.0
1 day	5.5	3.3	4.2	1.0	>1.0	1.0
2 days	3.0	4.0	3.6	>1.0	>1.0	>1.0
3 days	3.0	7.6	5.8	1.5	1.0	1.2
4 days	6.0	3.3	4.4	2.5	2.7	2.6
5 days	8.5	8.6	8.6	9.5	11.0	10.4
6 days	5.0	7.6	6.6	8.0	13.0	11.0
Daily Use	61.7	58.1	59.6	67.7	61.8	64.1

*Note.* Total sample N = 502, N = 201 for females and N = 301 for males.

As the data show, 60% of participants (N = 299) reported using Facebook on a daily basis with 62% (N = 124) of daily users females and 58% (N = 175) males. The perceived use of Facebook among other students was similar to students own; with the majority of respondents (64%) reporting others used the SNS every day. The next survey item asked students to report the average number of hours they spent each day on Facebook. The responses ranged from 0-20 hours each day on Facebook, with average rate of 1-2 hours found among both male and female participants. Students reported the number of days they used Facebook each month and what they perceived other students on campus used Facebook for the same period (see Table 9).

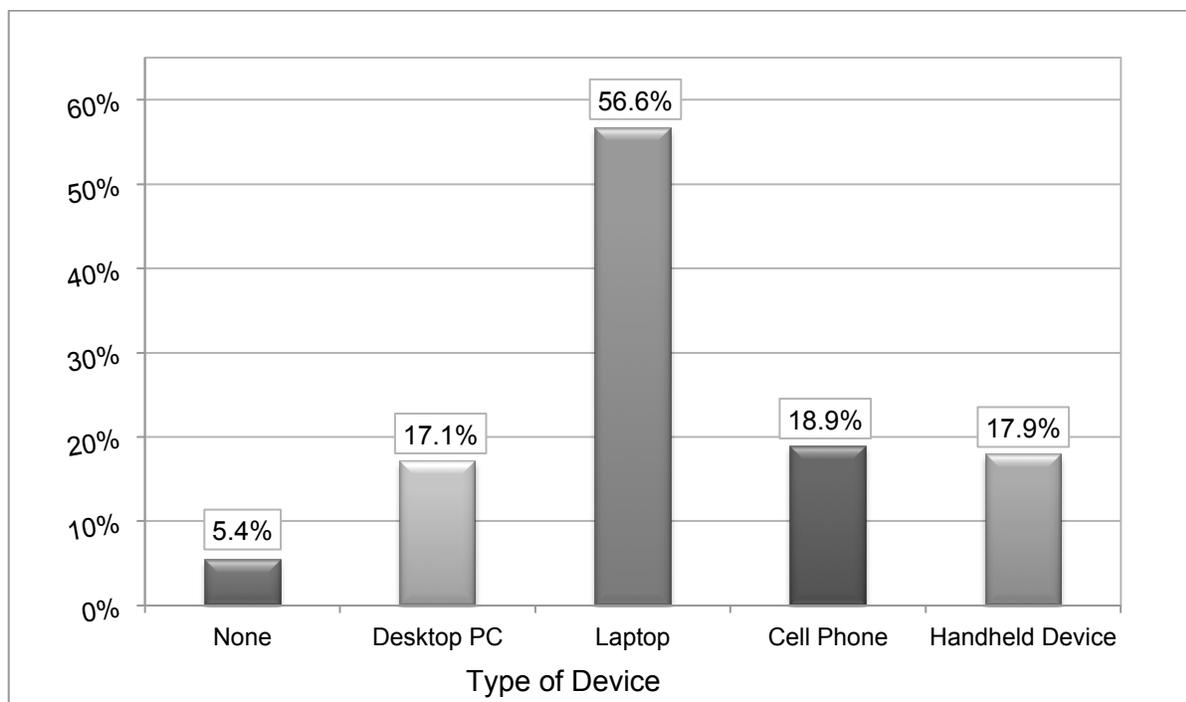
Table 9

*Percentage of Students and Number of Days Using Facebook Last Month Compared to Their Reported Rates for Other Students on Campus.*

No. days	Students' Use (%)			Other Students' Use (%)		
	Female	Male	Total	Female	Male	Total
None	7.5	7.0	7.2	>1.0	>1.0	>1.0
1-2 days	1.0	2.0	1.6	>1.0	>1.0	>1.0
3-5 days	5.5	4.8	5.0	2.5	>1.0	>1.0
6-9 days	2.0	2.3	2.2	2.5	1.0	1.6
10-19 days	10.9	16.9	14.5	1.5	3.7	2.8
20-29 days	31.8	29.6	30.5	33.3	34.2	33.9
Daily Use	41.3	37.5	39.0	62.2	60.1	60.0
Total N	201	301	502	201	301	502

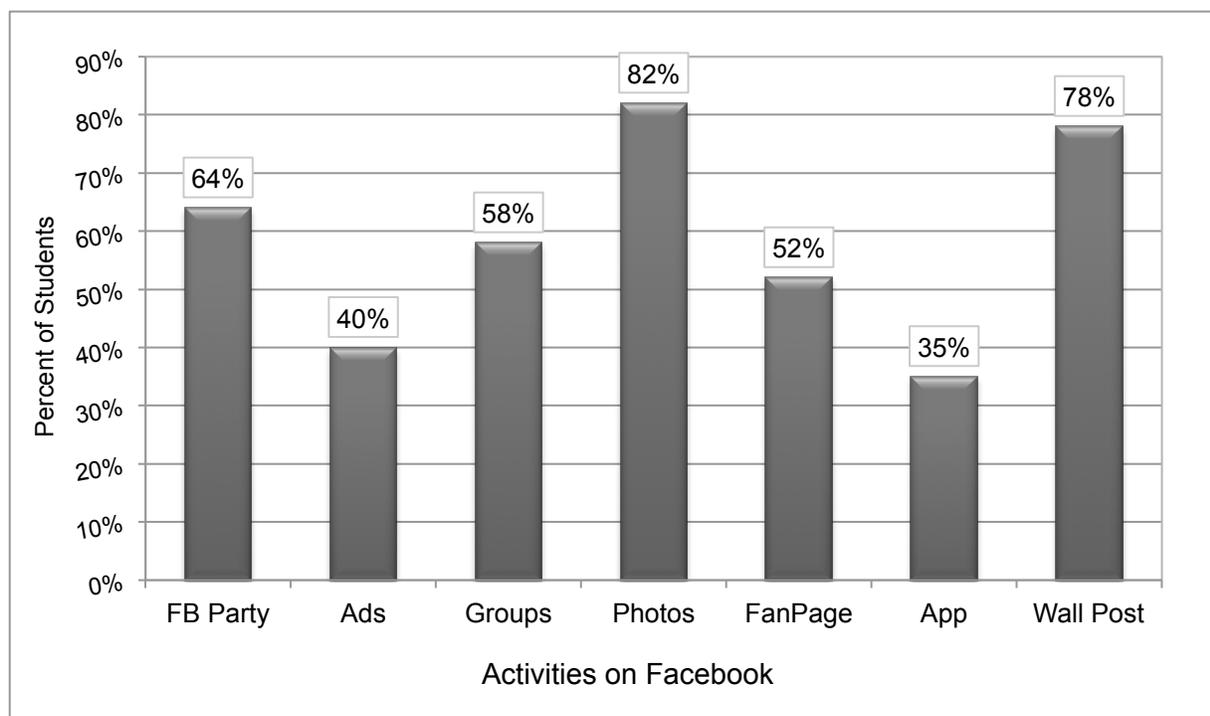
The largest number of respondents (39.0%) indicated they used Facebook everyday in the last month, with the daily use relatively equal among males and females respectively (41.3% v. 37.5%). Regarding other students Facebook use last month the numbers were higher, with the majority (60.0%) of students surveyed reporting daily use of Facebook among their peers. It is notable that 69.5% (N = 349) of students reported using Facebook 20 days or more each month, whereas 93.9% (N = 471) of students perceived other students' usage Facebook at this same rate.

Students were asked which device they most commonly accessed Facebook from with the response options including (a) none, (b) desktop computer, (c) laptop or netbook, (d) cell phone, or (e) handheld device (e.g. iPod Zune). The results for this are illustrated in Figure 2.



*Figure 2.* Percent of students and devices from which they accessed Facebook in the last month (N = 502).

Most students reported that they used a laptop to access Facebook with cell phones and desktop computers used at roughly the same rate. Twenty-seven (5.4%) of participants indicated there was no one specific device they used the most to access Facebook. Students were then asked if they were involved in any extracurricular activities (e.g. RSO, student government, intramural sports) of which 287 (57.2%) said yes and 215 (42.8%) said they did not take part in these activities. Figure 3 shows the rates of exposure to alcohol-related content by students while on Facebook.



*Figure 3.* Students' indicating they were exposed to alcohol through the various activities or features on Facebook.

As the data reflect, students reported that they were exposed to alcohol through the various Facebook features, with the highest reported rates through photos (82%), wall posts (78%), and invitations to parties (64%). The two lowest reported rates of exposure came from Facebook ads (40%) and applications related to alcohol on the SNS (35%).

The first of the final two questions on the survey asked students if they felt their use of Facebook affected their alcohol consumption. Of the 502 respondents, only 39 (7.8%) revealed it was affecting their alcohol use with the remaining 463 (92.2%) reporting their alcohol use was not affected by their Facebook use. Students were then asked to respond yes or no to the following question "Do you feel that your usage of Facebook has affected other students alcohol consumption?" of which 249 (49.6%) said yes and 253 (50.4) said it had not.

### Data Preparation

It is not uncommon when preparing a dataset for final analysis, to examine whether the underlying assumptions have been met and if not to what extent (Zuur, Ieno, & Elphick, 2010). According to Zuur et al. (2010) some violations have little impact; however, these can be avoided by exploring the data prior to conducting the final analysis. For this study the data was examined for extreme values or outliers and whether multicollinearity existed among the predictor variables. This was done as the proposed analyses included examining the relationship between the dependent variables (students' Facebook and Alcohol use) and the predictive ability of each independent/predictor variable under study. Zuur et al. confirmed that when the results of the multiple regression analyses included this aspect, it was important to explore the data in order to move forward with confidence. The output from the initial descriptive statistics is presented in Table 10, for the proposed predictor variables in this study. These were questionnaire items 11-17 soliciting students' self-reported rates of alcohol consumption and Facebook use.

Table 10

*Descriptive Statistics for Items Soliciting Students' Alcohol Consumption and Facebook Use.*

Item No.	Mean	SD	Skewness	Kurtosis	Range
11. No. times students' binge drink.	1.39	2.07	2.01	4.48	0-12
12. No. drinks per week.	4.63	6.92	3.01	14.24	0-60
13. No. drinks per incident.	2.80	3.29	1.54	2.69	0-20
14. Mean number days on Facebook per week	5.49	2.30	-1.29	.31	0-10
15. Mean number hours on Facebook per day	2.45	2.66	2.62	8.65	0-20
16. No. days per month students drink alcohol	4.83	5.65	1.68	3.16	0-30
17. Mean No. days per month using Facebook	21.43	10.31	-.93	-.58	0-30

*Note.* N = 502.

The mean and standard deviation data provided an initial picture of students' behaviors (alcohol consumption and Facebook use) however, based on the newness of the subject matter there were no expected values to compare for extreme numbers outside of the norm. Therefore the data representing the skewness and kurtosis of the sample were reviewed to more thoroughly explore the underlying nature of the sample distribution. Skewness describes the symmetry (or lack of) a particular distribution, with extreme cases showing the data grouped together at either end of a distribution. If the data is skewed it is described as being positive or negative depending on which end of the distribution the group of numbers fall. The normal distribution (or bell-shaped curve) has a skew value of zero or no deviation, with Garson (2012) reporting that acceptable values ranging may range from  $\pm 2.0$  (Garson, 2012). The range of values for these seven items was  $-0.93$  to  $3.01$ , outside the normal parameter indicating abnormalities within these items.

As part of the determination of normality the kurtosis values of these items were reviewed to identify any abnormalities and if so to what extent. This information is important as it provides a numerical description for the shape of the distribution, with variations in the data indicating extreme peaks or flatness and subsequent problems for consideration. The kurtosis values beyond  $\pm 3$  are outside the acceptable range (Garson, 2012) with the sample data revealing these seven items a ranged from  $-0.58$  to  $14.24$ . Based on these results, the dataset and histograms (see Appendix H) for each item were prepared and examined for outliers and any other indicators of a non-normal distribution.

While no significant outliers were found to influence the dataset overall, the range in values and distribution was different for items soliciting students alcohol and Facebook use. Previous research has revealed that non-normal distributions are considered typical with self-

reported alcohol data, in particular as people tend to under report their own use compared to that of others. This knowledge regarding the existing trends in the alcohol data prohibited the traditional approaches taken to transform the data for analysis (Delucchi & Bostrom, 2004). As a result the items soliciting students' self-reported alcohol and Facebook usage were separated with the underlying distribution of these data further examined.

The next step involved computing a Spearman Rank correlation to confirm whether the items were significantly related to each other (or not). The results including the test statistic and calculated level of significance are provided in the matrix for review (see Table 11).

Table 11

*Correlation Matrix for Items Measuring Students' Alcohol Consumption and Facebook Use*

Item No.	11-AL	12-AL	13-AL	14-FB	15-FB	16-AL	17-FB
11-AL	1.00	.746** .000	.625** .000	.064 .153	-.051 .255	.717** .000	.068 .131
12-AL		1.00	.768** .000	.039 .385	-.113 .011	.836** .000	.058 .194
13-AL			1.00	.033 .459	-.084 .059	.664** .000	.059 .189
14-FB				1.00	.594** .000	.055 .216	.758** .000
15-FB					1.00	.088* .049	.541** .000
16-AL						1.00	.087 .050
17-FB							1.00

Note. N = 502.

\*  $p < .05$

\*\*  $p < .01$

The four questions soliciting students' self-reported rates of alcohol consumption (11, 12,

13, and 16), are identified in the table by their number and the letters “AL”. The same identification system was used for the questions representing student’s rates of Facebook use (14, 15, and 17), with “FB” placed after the question numbers to help identify which construct was associated with the data in the table. The results revealed significant correlation coefficients *within* the Alcohol and Facebook questions indicating the presence of multicollinearity for these data. The primary concern regarding this centered on the distortion of the true effects of the predictor variables on the dependent variables under study (Garson, 2012).

The next step involved statistically transforming the data prior to analysis, so that the final results accurately represented the students’ responses. Data transformation is a common practice for manipulating data that are not normally distributed (Ferketich & Verran, 1994; Zuur, leno, & Elphick, 2010) with Tabachnik and Fidell (1989) recommending that "unless there are compelling reasons not to, it is safer to transform" (p.79). Transformation aims to normalize the distribution so that parametric statistics can be used without concern about violating assumptions of normality (Bradley, 1978). Moreover, transformation purportedly increases statistical power and minimizes the attenuation of correlations (Dunlap, Burke & Greer, 1995; Grissom, 2000).

A single solution Principal Component Analysis (PCA) was used to transform data for the alcohol items (11, 12, 13 16). According to Tabachnick and Fidell (2007) a principal components analysis (PCA) is a statistical technique used to determine whether a set of highly correlated variables are better represented by some combination of the data represented by the creation of a new factor(s) or component(s). Typical results of the analysis produce values for each question ranging from 0.0 to 1.0, with items closer to 1.0 indicating the new component was more representative of original dataset. Abdi and Williams (2010) noted that the PCA is among the most commonly used multivariate statistical techniques in all scientific disciplines. With

social science researchers using this method to validate survey items and data collected.

The PCA showed that the alcohol items were statistically similar in nature with values ranging from .82 -.85 respectively. As a result the data were collapsed and a new component was created, labeled Alcohol Use and used in all of the requisite data analysis. A PCA was computed for the items soliciting students self-reported use of Facebook (14, 15, 17) with a single solution PCA accounting for 70% of variance within these items. The data were collapsed and a new component was named Facebook Use and used with the new variable Alcohol Use to compute the final analysis.

### **Data Analysis and Results by Research Question**

*Research question 1. What is the relationship between students' alcohol consumption and Facebook use?*

A Spearman Rank correlation tested the potential relationship between students Alcohol Use and Facebook Use using the data from the two new factors. The results revealed there was no significant association between these variables ( $r_s(501) = .03, p = .488$ ).

*Research question 2. What is the relationship between students' alcohol consumption and invitation to alcohol-related parties, exposure to alcohol-related advertisements, groups, photos, fan pages, applications or wall posts on Facebook within the last 30 days?*

Students' Alcohol Use was compared to the data for each Facebook item, with a series of Spearman Rank correlations computed to identify any significance between these factors. The first correlation examined students' Alcohol Use and invitations to parties that involved alcohol on Facebook, with the results revealing no statistically significant relationship between these variables ( $r_s(501) = .04, p = .43$ ).

Students' Alcohol Use was compared to their self-reported rates of exposure to

advertisements involving alcohol while on Facebook. The findings of this analysis revealed that students' alcohol consumption was not influenced by the reported experiences to alcohol-related advertising on Facebook, ( $r_s(501) = .35, p = .43$ ). The potential relationship between students' self-reported Alcohol Use and number of times they were viewed alcohol related groups on Facebook was examined. The resulting correlation coefficient was not significant,  $r_s(501) = .051, p = .253$ , indicating students' consumption of alcohol was not related to their encounters with alcohol-related groups on Facebook.

Students' rates of exposure to photos that involved alcohol on Facebook were compared to their self-reported Alcohol Use. The correlation coefficient  $r_s(501) = .022, p = .617$ , illustrated no statistical significance relationship was present between these two variables under study. The potential relationship between students' Alcohol Use and number of times they observed fan pages with alcohol-related content on Facebook was tested. The results revealed a correlation coefficient,  $r_s(501) = .047, p = .29$ , showing no significant relationship between these variables.

Students were asked to identify the number of times in the last 30 days they had been exposed to alcohol-related applications on Facebook. This was compared to their self-reported Alcohol Use to identify whether a relationship existed between these two variables. The results revealed a correlation coefficient,  $r_s(501) = .015, p = .734$ , indicating students' alcohol consumption was not related to their exposure on Facebook to applications involving alcohol. The participants Alcohol Use was compared to their exposure to Facebook wall posts involving alcohol within the last month. The correlation coefficient  $r_s(501) = .031, p = .485$ , revealed there was no significant relationship between these two variables.

*Research question 3. To what extent can students' sex, rank, age, employment status, enrollment, or GPA predict their Facebook use?*

To answer this question a multiple regression analysis was computed to test whether the demographic variables significantly influenced the criterion variable, students' Facebook Use. The predictor variables included student's rank broken down by class, with dummy coding applied in order for this variable to be included in the analysis. Students' age, employment status, enrollment and GPA were also added for a complete estimation and testing.

The results revealed the model as a whole did not predict students' Facebook Use better than chance,  $F(9, 483) = 1.33, p = .21$ . Together students' rank, age, employment status, enrollment and GPA did not significantly predict students Facebook Use, accounting for only 3% of the total variance ( $R^2 = .03, p = .205$ ). Moreover, knowledge of students rank, age, employment status, enrollment or GPA independently, did not facilitate the prediction of students subsequent Facebook Use.

*Research question 4. To what extent can students' sex, rank, age, employment status, enrollment, or GPA predict their alcohol consumption?*

To answer this question a multiple regression analysis was computed to examine the extent to which the predictor variables, students' rank, age, employment status, enrollment or GPA contributed to students' Alcohol Use. The predictor variables included student's rank (dummy coded by class) along with age, employment status, enrollment and GPA included to test the estimated model.

The results revealed the overall model did not significantly predict students' Alcohol Use  $F(9, 483) = 1.26, p = .242$ , accounting for only 5% of the total variance ( $R^2 = .05, p = .26$ ). What is more, knowledge of students' rank, age, employment status, enrollment, or GPA did not increase the likelihood, better than chance, of predicting their Alcohol Use.



## **CHAPTER 5**

### **SUMMARY, FINDINGS, DISCUSSION, AND RECOMMENDATIONS**

#### **Overview**

This chapter provides an over and summary of the current research project. The results and discussion of related research for each question under study is presented, followed by the researcher's recommendations for future research and practice in the field of health education.

#### **Purpose of the Study**

The purpose of this study was to investigate whether college students' use of the social networking site Facebook influenced their alcohol consumption. In particular, the relationship between students' alcohol use and exposure to alcohol-related content through various features or activities on Facebook was examined. An additional focus was to identify whether certain variables increased the chances of predicting students' alcohol and Facebook use.

#### **Summary of the Study**

Researchers have over 50 years of data confirming that alcohol abuse is a major public health issue among colleges students (ACHA, 2011; Core Institute, n.d.; Hingson et al., 2009; Johnston, O'Malley, & Bachman, & Schulenberg, 2005; Perkins, 2006; Perkins, Meilman et al., 1999; Straus & Bacon, 1953; Wechsler, Davenport, Dowdall, Moeykens, & Castillo, 1994; Wechsler & Kuo, 2000; Wechsler, Lee, Kuo, & Lee, 2000) Data from recent studies revealed that approximately 85% of students drank alcohol in the last year (ACHA, 2011; Core Institute, n.d) and the 2010 Core Alcohol and Drug Survey results revealed three-fourths of students surveyed consumed alcohol in the last month (Core Institute, 2012). Data from this study (Core Institute)

revealed that roughly 55% of college students in the U.S. reported engaging in excessive or binge drinking at least once in the previous two weeks. The negative consequences these behaviors have on them is extensive, with the NIAAA 2012 report *College Drinking* noting that these problems “exact an enormous a toll on the intellectual and social lives of students on campuses across the United States” (p.1).

It was not until after this project began that empirical studies emerged, documenting college students’ excessive internet use and problems related to addiction (Christakis, 2010; Christakis, Moreno, Jelenchick, Myaing & Zhou, 2011; Echeburua & de Corral, 2010; Kuss & Griffiths, 2011; Wilson, Fornasier, & White, 2010). This is not surprising considering these students have literally grown up with the ability to access the World Wide Web, and have experienced significant advances in technology that have only simplified this process over time. But with limited research to support my hypothesis that these two behaviors were in some way connected, I elected to direct my project towards asking the students to report their activities, in particular their rates of alcohol consumption and rates of use and activities while on Facebook.

While self-reported data has inherent issues with producing unreliable results, this limitation is well documented and many noteworthy cross-sectional studies have been conducted. The remainder of this chapter will summarize the steps taken during the course of this project followed by a discussion of the outcomes and research related to the topic under study.

The research project took place in the center region of the country at a mid-size institution, with an enrollment of 15,980 undergraduate students, of which 9,079 were males and 6,901 were females. The literature review revealed that college students ages 18-24 were most likely to engage in alcohol consumption which led to my restricting participation to undergraduate students within this age range. A paper survey was designed by the researcher and

validated by experts in the appropriate fields and used to gather the self reported rates of alcohol consumption and Facebook use along with exposure to alcohol-related information online among participants.

Data was collected over the course of two-weeks, from January 21-31, 2010, with participants solicited from within the universities main student center. Students who frequented the building during this time and passed the collection table were approached and if eligible (undergraduate and enrolled) were asked to take part in the research study. Anyone who agreed submitted a signed consent form granting official approval after which they were given the cover letter and brief 33-item questionnaire to review and fill in. Over the course of two weeks 550 students submitted the survey instrument, with 502 complete and included in the final analysis. The data was hand entered and appropriate practices employed to ensure its validity after which the official analyses were computed.

Descriptive statistics, correlations and regression analyses were used to describe the study sample and supply the data necessary to answer the questions under study. The results revealed that most of the respondents of juniors or senior rank (49.5%) were 20 years of age (50%), with an overall 'B' grade point average. Over half of the respondents were males (60%) and employment and enrollment status were roughly equal, with 50 % of the students reporting they worked while attending school fulltime.

Items soliciting students rates of drinking revealed that the average rates of binge drinking among the group was 1-2 times in the two weeks prior to data collection. When asked how many drinks on average participants consumed in a weeks period, the most common response was 3-4 drinks for the total sample. Regarding gender, males drank on average 5-6 drinks each week with females reporting consuming 2-3 drinks in a seven day period. When

students did drink the group averaged 2-3 drinks per occasion, with 4-5 days the typical number students drank each month. When females drank alcohol, 27.3% reported drinking 1-2 drinks, with 24.2% of males indicating this was the most common number of drinks they consumed.

When asked about the number of days they used Facebook per week, 5-6 days was the group average with no difference between male and female activity. Two to three hours was the most common response for time spent on Facebook each day with both females and males indicating that this was how much time they spent on the social networking site. When asked what they thought was the average number of days in the last month they frequented Facebook, 21-22 days was the typical group response for use during that time. Once again no differences in the monthly rates of Facebook use were reported between male and female students.

### **Summary of Findings and Discussion of Results by Research Question**

#### **Research Question 1.**

*What is the relationship between students' alcohol consumption and Facebook use?* This question was asked as the researcher was interested in finding out if the students' rates of Facebook use were related or had an influence on their alcohol consumption

The researcher To answer this question used student data from two dependent variables (Facebook use and alcohol use) were used to to compute the required statistic to answer this research question. A Spearman Rank correlation tested the potential relationship between students' Facebook use and alcohol use, with the results indicating there was no significant association between these variables ( $r(501) = .03, p = .488$ ). The model  $R^2$  0.0009 only accounts for .03% of alcohol use. Furthermore, the  $R^2$  of 0.0009 indicates that a regression line does not fit for data very well.

In a study conducted by Yen, Ko, Yen, Chen and Chen (2009), the researchers suggested that extreme Internet use is associated with harmful drinking patterns. With this concept of an association between Internet usage drinking patterns, academic researchers have attempted to understand the relationship between Facebook and alcohol. At the present time, studying the relationship between the usages of Facebook and alcohol consumption is a new area of research, and there is very little academic research to compare findings.

Moreno et al. (2012) examined the relationship between displayed alcohol use and use of alcohol of college students. To determine the subjects' usage of Facebook and alcohol, the researchers used a content analysis and a cross-sectional survey. The researchers found that subjects who displayed alcohol on their Facebook were more likely to be categorized as at risk for problem drinking. The researchers found that, of the subjects' Facebook profiles used, 64.3% (N = 144) had not displayed or referenced alcohol on their profile, 19.6% (N = 44) of subjects displayed images and referenced alcohol on their profile, and 16.1% (N=36) of subjects displayed references to intoxication or problem drinking on their Facebook page. The study indicated that 58% of individuals displayed references to intoxication or problem drinking on their Facebook page, 37.8% of subjects displayed alcohol on their Facebook page, and 22.6% of subjects who did not display alcohol on their Facebook page met the criteria for at-risk or problem drinking. The researchers conducted a logistic regression model of those subjects that displayed references to intoxication or problem drinking on their Facebook page and determined that those subjects were more likely (odds ratio, 4.4; CI, 2.0-9.4) of scoring in the problem-drinking category. Those subjects who simply displayed alcohol were not significantly at risk (OR, 1.97; 95% CI, 0.95-4.0).

Whereas this study does not yield any statistical significance, other studies in which the

association between college students behaviors while on Facebook and consumption of alcohol are starting to emerge (Moreno , 2012, CASA Columbia, 2011). These studies, however, are unlike the present as they did not assess students' Facebook use which remains lacking in the published research and in need of further studies to determine any relationship.

### **Research Question 2.**

*What is the relationship between students' alcohol consumption and invitation to alcohol-related parties, exposure to alcohol-related advertisements, groups, photos, fan pages, applications or wall posts on Facebook within the last 30 days?*

In the current study, 64% of the students indicated that they had been invited through Facebook to a party that involved alcohol. Although there is not current research that examines the rate of Facebook invitations to events that involve alcohol, there is data on the rate of invitation to general events, and the amount of alcohol related Facebook events. Educause (2010) found that 50.4% of the users have used social networking sites to invite people to events. Furthermore, Pempek et al. (2009) found that 54.35% of the subjects reported that they responded to or reviewed events or invitations, on average, 1-2 days a week. Mart, Mergendoller, and Simon (2009) found that during the time of their study, there were approximately 2,200 events associated with the major alcohol distributors. Although there is no current research that measures invitations on Facebook to parties that involved alcohol, it is evident that Facebook is being used as a method to solicit guests to an event, and there are a number of alcohol related events present on Facebook.

Current research (Winpenny, Patil, Elliott, Villalba van Dijk, Hinrichs, Marteau & Nolte, 2012; Mart) indicates that Facebook advertisements appearing on an individual's page are based on the user's interests and likes. In the current study, 40% of the students saw advertisements for

alcohol on Facebook. This closely resembles the findings of (Winpenny, et al., 2012), in which the researchers found that 48% of the ads subjects were exposed to were alcohol related. The limited academic research and results from the current study indicated that a vast majority of individuals are exposed to alcohol advertisements while on Facebook.

Pempek et al. (2009) reported that 48% of students frequented groups on Facebook roughly 1-2 days per week. In the current study, 58% of participants indicated that within the last 30 days they saw groups on Facebook that involved alcohol. This was not surprising based on the results of Mart, Mergendoller, and Simon's (2009) search for alcohol-related groups on Facebook, in which 58,000 different groups were identified.

The use of photos on Facebook is a very common practice. As stated previously, 250 million photos are posted on Facebook daily (Facebook, 2012). Educause (2010) found that 72.1% of subjects in their study shared photos. Moreover, in a study conducted by (Pempek et al. (2009), the researchers found that 58.7% of the subjects reported viewing photos on Facebook 5-7 days a week. In the current study, 82% of the students saw photos on Facebook that involved alcohol. While there is not current research that measures students' self-reported exposure to photos that involve alcohol on Facebook, there is current research that measures the amount of students who have alcohol content on their pages, demonstrating that photos of alcohol are present and being posted by college students. In study conducted by (Moreno, Christakis, Egan, Brockman, Becker, 2012) the researchers examined the display of alcohol content of subjects' pages. To be considered "displayed alcohol content", the data had to be a photo, a researcher's description of a photo, or exact text from the subject's page. The data gathered was lumped into one category called *displayed references to alcohol*. Whereas the results are a cumulative score of photos and comments, it is the closest research to compare to current research. In Moreno et

al. (2012), the researchers reported a slightly lower rate; only 46% of their subjects displayed references to alcohol use on their Facebook page. In a study conducted by Fournier & Clarke (2011), subjects had on average four images on their page that involved alcohol. Glassman (2012) found that 29% of college students posted personal photos of themselves consuming alcohol, and 56% included pictures of their friends consuming alcohol on Facebook. Although there is no current research that measures students' exposure to photos that involve alcohol on Facebook, it is evident that students do have alcohol content on their pages, students view photos on a regular basis, and they are posting photos that involve alcohol.

In the current study, 52% of the students were exposed to Facebook fan pages that involve alcohol. There is very limited research that examines students' exposure to Facebook fan pages and alcohol consumption, but this research does not examine the rate of Facebook fan pages that involve alcohol. Mart et al. (2009) conducted a search and determined that there were 93 fan pages for the top-selling beer brands, and a total of 334 pages for the ten top-selling spirits brands. The fans for the 427 fan pages totaled more than 4.4 million. Mart et al. (2009) goes on to say that students use the fan pages to glorify alcohol-related products. Despite the fact that there is no current research measuring students' exposure to Facebook fan pages involving alcohol, it is evident that Facebook fan pages do exist in vast numbers, and they are being used by major alcohol distributors to promote their products on Facebook.

In the current study, 35% of the students were exposed to Facebook applications that involve alcohol. Currently, no research exists that measures students' exposure to applications that involve alcohol on Facebook, but there is data indicating that applications are currently in use, and do involve alcohol. Mart et al. (2009) found that there more than 500 separate applications associated with alcohol. Shultz (2011) indicated that by 2013, there will be 73.6

million app users in the United States, and this has caused companies, such as Malibu Rum, to create applications to help bolster their sales. With the growing number of individuals who use Facebook applications, and the increasing number of Facebook apps involving alcohol, it is reasonable to hypothesize that students' exposure to alcohol through applications will continue and possibly increase.

The use of posts to express opinions is a common practice on Facebook. In a study conducted by Pempek et al. (2009), researchers reported that 32.6% of subjects in their study read posts on their walls 5-7 days a week, and 44.57% subjects read posts on others' pages 5-7 days a week. In the current study, 78% of the students reported that they were exposed to Facebook wall posts involving alcohol. While there are not current studies that measure student exposure to alcohol-related posts, there is research that measures the rate of alcohol-related content found on students' pages. Egan and Moreno (2011) reported a slightly higher rate, stating that 85% of the subjects had alcohol references and/or comments on their profiles. A more recent study conducted by (Moreno et al., 2012) reported that only 46% of their subjects displayed references to alcohol use on their Facebook page, which is a much lower rate. Fournier & Clarke (2011) examined the amount of alcohol content found on students' Facebook pages and determined that, on average, subjects had 0.2 wall posts involving alcohol on their Facebook profile pages. It would appear that, through recent years, the rate of students posting alcohol-related posts on their Facebook pages has varied, and at times, closely mirrored the rate of exposure to alcohol-related posts in the current study. It remains a possible outlet for students to be exposed to alcohol-related content.

### **Research Question 3.**

*To what extent can students' rank, age, employment status, enrollment, or GPA predict*

*their Facebook use?* To answer this question a multiple regression analysis was computed to test whether the demographic variables increased the ability to predict students' Facebook Use. The predictor variables included student's rank broken down by class, with dummy coding applied in order for this variable to be included in the analysis. Students' age, employment status, enrollment and GPA were also added for a complete estimation and testing.

The results revealed the model as a whole did not predict students' Facebook Use better than chance,  $F(9, 483) = 1.33, p = .21$ . Together students' rank, age, employment status, enrollment and GPA did not significantly predict students Facebook Use, accounting for only 3% of the total variance ( $R^2 = .03, p = .21$ ). Moreover, knowledge of students rank, age, employment status, enrollment or GPA independently, did not facilitate the prediction of students subsequent Facebook Use.

In the current study, the average number of hours per day of Facebook usage was 2.25 hours for males and 2.74 for females. The most reported number of hours per day of Facebook usage for males was 1 hour (37.9%), closely followed by 2 hours (25.2%). The most reported number of hours per day of Facebook usage for females was 1 hour (36.8%), closely followed by 2 hours (20.45%). However, when examining daily usage of Facebook, more females (34.8%) than males (16.6%) used Facebook for 4 hours.

This diversity in usage can also be seen in those students that did not use Facebook. 11.3% of males and only 8% of females used Facebook for 0 hours a day. This finding mirrored the findings of (Pew, 2012; Facebook, 2012), which suggests that more females are using Facebook than males. Even though it is known that more females use Facebook than males, it has not been widely studied whether females use Facebook for more time than their male counterparts. According to McAndrew & Jeong (2012), females spend more time on Facebook

than males. The researchers found that, on average, females spend 10.16 hours on Facebook, whereas males spend an average of only 7.50 hours a week. The average number of days per week on Facebook for males was 5.46, and 5.52 days per week for female participants. The most reported number of days per week of Facebook usage was 7, males (58.1%) and females (61.7). Only 7% of males and 7% of females indicated 0 days of Facebook usage per week.

Whiles students' age and rank or year in school were not identified as a significant predictor of students' Facebook use, data are starting to show that this may in fact be a concern. For example, in Valenzuela, Park and Kee's (2008) review on SNSs and social capital, students' age and year in school were related to the likelihood that they had an active Facebook account. These authors added that younger students in particular had a higher rate of Facebook account than their older classmates. Regarding GPA, Kirschner and Kapinski (2010) found that students surveyed felt their Facebook activity did not impact their grades. With 27% of students in this study admitting their Facebook use had a negative impact on their academic performance. When asked to elaborate on what specifically contributed to their Facebook use and grades, students, "stated that they procrastinated and were distracted from school work, and that they had poor time-management skills" (p. 23).

#### **Research Question 4**

*To what extent can students' rank, age, employment status, enrollment, or GPA predict their alcohol consumption?* To answer this question, a multiple regression analysis was computed to test whether the demographic variables increased the ability to predict students' alcohol use. The predictor variables included students' rank, broken down by class, with dummy coding applied in order for this variable to be included in the analysis. Students' age, employment status, enrollment and GPA were also added for a complete estimation and testing.

The results revealed the model, as a whole, did not predict students' alcohol use better than chance,  $F(9, 483) = 1.26, p = .24$ , accounting for only 5% of the total variance ( $R^2 = .05, p = .26$ ). What is more, knowledge of students' rank, age, employment status, enrollment, or GPA did not increase the likelihood, better than chance, of predicting their alcohol use.

In the current study, sex was not found to be a predictor for students' use of alcohol. Unlike the current study, prior research conducted by (Presley, Meilman, & Lyerla, 1993; Wechsler et al., 2002; Johnston, O'Malley, Bachman, & Schulenberg, 2005; American College Health Association-National College Health Assessment II, 2009; Johnston et al., 2009; Scribner et al., 2011) found that there is a relationship between alcohol and sex, with males, on average, consuming more alcohol than their female peers.

In the current study, 5.6% of the subjects were freshmen, 17.7% were sophomores, 23.5% were juniors, 26.1% were seniors, and 27.1% were undeclared. Whereas class rank was not found to be a predictor for students' use of alcohol, research conducted by (Turrissi, R., Padilla, K.K., & Wiersma, K.A. 2000; Presley et al., 1997) has indicated that underclassmen consume a lower level of alcohol than their upperclassman peers. Moreover, (Bergen-Cico, 2000) found that as students progress through their college career, their level of alcohol consumption decreases.

In the current study, students' ages ranged from 18-24, with the largest percentage, 21.5%, being 20 years old. The current study's subjects fall within the age range found to have the highest rate of alcohol consumption (Naimi et al., 2003). Data from the current study indicates that a student's age was not found to be a predictor for his or her use of alcohol. Much like previous research conducted on class rank, as time passes and students get older, their amount of alcohol decreases. In a Presley and Meilman study (1992), the researchers broke down the subjects into two defined age groups. The first group was traditional students, 24 years and

younger, and the second group was nontraditional students, 25 years or older. Presley and Meilman found that traditional students consumed, on average, 6.9 drinks per week; nontraditional students consumed 2.27 drinks per week. Wechsler et al. (1998) found that the rate of binge drinking was reported at a consistently higher rate of 45.5% for subjects under 24 years old, whereas only 17% of subjects 24 years and older binge drank.

In the current study, a majority of the subjects (50.2%) indicated that they were employed at the time of data collection. Students' employment status was not found to be a predictor for their use of alcohol in this study. This finding is mirrored in current research conducted by (Chanvuth, 2006), which found there were no statistically significant relationships between alcohol consumption and the status of employment. These findings are also confirmed by (Presley, & Meilman, 1992; Presley et al., 1998; Presley, et al., 2004), who did not report a relationship between employment and alcohol consumption.

In the current study, the distribution of full-time students (49.2%) and part-time students (50.8%) was equally distributed, meaning that 100% of the subjects were currently enrolled at a university. Whereas enrollment was not found to be a predictor for students' use of alcohol, current research conducted by (Hingson et al., 2009; Johnston et al., 2002) found that individuals attending college had a higher rate of alcohol consumption than their peers who did not attend college. Current research conducted by (Slutske, 2005) found that 18% of college students had clinical alcohol-related problems, whereas only 15% of their non-college peers had clinical alcohol-related problems.

To graduate from a university, students are required to meet a certain level of academic achievement. To reach that achievement, students need the ability to recall information. Unfortunately, when students consume alcohol, their ability to recall declines (Hanson, Meduba,

Padual, Tapert & Brown, 2011). In the current study, GPA was not found to be a predictor for students' use of alcohol. Research conducted by (Presley et al., 1996) reported that students with an "A" average consumed approximately 3.2 drinks per week, which was less than that consumed by students with "B" (4.6), "C" (5.8), or "D/F" (8.4) averages. Furthermore, Wechsler et al. (2000) reported that students who participate in frequent heavy drinking episodes are considerably more likely to miss class and fall behind in class work than students who drink heavily only on occasion, or those who do not drink heavily at all. This previous finding is further supported by research conducted by (Pascarella, Goodman, Seifert, Tagliapietra-Nicoli, Park & Whitt, 2007), in which the researchers found that binge drinking significantly affected a student's GPA.

### **Alternate Explanations**

Studies regarding the potential relationship between an individual's alcohol consumption and internet usage are few, as this remains a relatively new subject within the field of social research. However, the use and subsequent abuse of alcohol has been well documented over time (Blankers, 2011; Perkins & Berkowitz, 1986; Presley, Meilman et al., 1993; Wechsler et al., 1995; Wechsler & Kuo, 2000). Blankers (2011) reported that "until the beginning of the nineteenth century attitudes towards drinking were characterized by a continued recognition of the positive effects of moderate consumption, without much public concern about the negative effects" (p. 8). However, with the rise of the Industrial Revolution the demands for a dependable workforce created the negative perceptions of alcohol abuse still present today (Blankers, 2011). Negative behaviors associated with alcohol abuse include lower productivity and/or absenteeism from work/school as well as withdrawal, neglect, and even abuse with significant others (Christakis et al., 2011).

More recently, social networking sites are increasingly popular among online users, with most people using these venues to keep in touch with their friends. The recent report of Facebook surpassing 1 billion users indicates the ubiquitous nature of this activity within society. While there are limited studies on the deleterious nature of internet usage, addiction specialists have begun to examine the impact of time spent online. According to Kuss and Griffiths (2011):

SNS's are a Global consumer phenomenon' with an exponential rise in usage within the last few years. Anecdotal case study evidence suggests that 'addiction' to social networks on the Internet may be a potential mental health problem for some users. However, the contemporary scientific literature addressing the addictive qualities of social networks on the Internet is scarce. (p. 2528).

## **Recommendations**

### **Recommendations for Future Research**

1. Conduct in-depth interviews to determine if students believe that Facebook has a positive or negative affect on their alcohol consumption. By conducting these interviews, future researchers may be able to a greater richer understanding of students' perceptions of Facebook and whether it impacts their alcohol consumption.
2. Conduct research studies that use alternate forms of data collection in order to reduce recall bias among college students. One reason for this is that subjects in this study were asked to recall Facebook and alcohol usage for periods extending as long as within the last 30 days. This duration may have restricted students' ability to accurately recall the precise rates of usage (both alcohol and Facebook). Using alternate methods of documenting and reporting these behaviors will allow for a more accurate representation of students' usage.

3. The final items on the questionnaire asking whether students felt their Facebook use should be revised to include either negative or positive impact on their lives.

### **Recommendations for the Field of Health Education**

1. Health education professionals may want to include internet addiction or problems with excessive use as part of their educational instruction or development of media campaigns.
2. Educate university students of the possible exposure to alcohol on Facebook. By educating incoming students on possibilities, the results from this study could be used to demonstrate the level of exposure to alcohol on Facebook.

### **Summary**

The purpose of this study was to investigate whether college students' use of the social networking site Facebook influenced their alcohol consumption. In particular, the relationship between students' alcohol use and exposure to alcohol-related content through various features or activities on Facebook was examined. An additional focus was to identify whether certain variables increased the chances of predicting students' alcohol and Facebook use. Results of this study indicate that student alcohol consumption and Facebook usage are on par with current research. No statistically significant correlations were found between Facebook usage, various features or activities on Facebook, and students' consumption of alcohol. The last section of this chapter focused on the recommendations for future research, as well as recommendations for health educators to integrate Facebook into future research and education efforts.

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APPENDICES

## APPENDIX A: CROW SURVEY

**Directions:** Please read and answer the following questions to the best of your ability by filling in one answer, or write in the correct response. The survey should take you approximately 10-15 minutes to complete.

1. What is your classification?
  - Freshman
  - Sophomore
  - Junior
  - Senior
  - Non-degree seeking
2. What is your current age? \_\_\_\_\_  
(Please specify)
3. What is your ethnic origin?
  - American Indian
  - Asian/Pacific Islander
  - White (Non-Hispanic)
  - Black (Non-Hispanic)
  - Hispanic
4. What is your marital status?
  - Single
  - Married
  - Separated
  - Divorced
  - Widowed
5. What is your gender?
  - Male
  - Female
6. Is your current resident as a student:
  - On Campus
  - Off Campus
7. Are you working?
  - Yes
  - No
8. How many credits are you taking this semester?
  - Part-time (< 15 hours)
  - Fulltime (> 15 hours)
9. What is your approximate grade point average?
  - A       D
  - B       F
  - C
10. What is your place of permanent state of residence?
  - In-state
  - Out of state
  - Other Country
11. Think back over the last two weeks. How many times have you had 5 or more drinks (male) or 4 or more drinks (female) in a two hour sitting? \_\_\_\_\_
12. What is the average number of drinks consumed in a week \_\_\_\_\_
13. When you consume alcohol, what is the average number of drinks consumed in a day? \_\_\_\_\_
14. What is the average number of days you use Facebook in a week? \_\_\_\_\_
15. What is the average number of hours you use Facebook in a day? \_\_\_\_\_
16. During the past 30 days, on how many days did you use alcohol? \_\_\_\_\_
17. During the past 30 days, on how many days did you use Facebook? \_\_\_\_\_
18. How many times do you think the average student on your campus has had 5 or more drinks (male) or 4 or more drinks (female) in a two hour sitting in the last two weeks? \_\_\_\_\_

19. How many days do you think the average student on your campus uses alcohol in a week? \_\_\_\_\_
20. How many days do you think the average student on your campus uses Facebook in a week? \_\_\_\_\_
21. How many days do you think the average student on your campus uses alcohol in a month? \_\_\_\_\_
22. How many days do you think the average student on your campus uses Facebook in a month? \_\_\_\_\_
23. Through which device do you most commonly access Facebook?
- None
  - Desktop Computer
  - Laptop or Netbook
  - Cell Phone
  - Handheld Device (iPod Zune)
24. Are you currently involved in extracurricular activities such as RSO, student government, intramural sports, fraternities, sororities, music, intercollegiate sports?
- Yes       No
25. How many times in the last 30 days have you been invited through Facebook to a party that involves alcohol consumption? \_\_\_\_\_
26. How many times in the last 30 days have you seen advertisements for alcohol on Facebook ? \_\_\_\_\_
27. How many times in the last 30 days have you seen Facebook Groups that involve alcohol? \_\_\_\_\_
28. How many times in the last 30 days have you seen photos on Facebook that involve alcohol? \_\_\_\_\_
29. How many times in the last 30 days have you seen Facebook Fan pages that involve alcohol? \_\_\_\_\_
30. How many times in the last 30 days have you seen Facebook applications that involve alcohol? \_\_\_\_\_
31. How many times in the last 30 days have you seen Facebook wall posts that involve alcohol? \_\_\_\_\_
32. Do you feel that your usage of Facebook has affected your alcohol consumption?
- Yes
  - No
33. Do you feel that your usage of Facebook has affected other students alcohol consumption?
- Yes
  - No

APPENDIX B: CORE PERMISSION LETTER

## APPENDIX C: COVER LETTER

Dear Student:

I am a health educator and a doctoral candidate in the Department of Health Education at Southern Illinois University Carbondale, requesting your voluntary participation in my dissertation research study.

The purpose of my study is to determine if there is a relationship between the use of Facebook and consumption of alcohol by students at Southern Illinois University Carbondale. To participate in this research project, you must be a current Southern Illinois University Carbondale student, age 18 or above.

Students who complete the survey will be entered to win an iPod Nano. Three winners will be randomly selected from the pool of students who complete the survey tool.

The survey will take 10 to 15 minutes to complete. All of your responses will be kept confidential within reasonable limits. Only people directly involved with this project will have access to the surveys.

Completion and return of this survey indicate voluntary consent to participate in this study. Please use the return envelope provided.

Questions about this study can be directed to me or to my supervising professor, Dr. Stephen Brown, Department of Health Education, SIUC, Carbondale, IL 62901  
Phone (618) 453-2777

Thank you for taking the time to assist me in this research.

Brent Crow  
618-364-2977  
cubmc2@aol.com

This project has been reviewed and approved by the SIUC Human Subjects Committee. Questions concerning your rights as a participant in this research may be addressed to the Committee Chairperson, Office of Sponsored Projects Administration, SIUC, Carbondale, IL 62901-4709. Phone (618) 453-4533. E-mail: [siuhsc@siu.edu](mailto:siuhsc@siu.edu)

## APPENDIX D: SURVEY REVIEW FORM

Directions: circle the answer that best represents your opinion about the survey you just completed the possible answers are as follows: “strongly disagree,” “disagree,” “agree,” or “strongly agree”

	Strongly Disagree	Disagree	Agree	Strongly Agree	Comments
1. The instructions for the survey were easy to understand and follow?	1	2	3	4	
2. The survey questions were easy to understand?	1	2	3	4	
3. The organization of the survey was logical?	1	2	3	4	
4. The time frame to complete the survey was reasonable?	1	2	3	4	

## APPENDIX E: PILOT STUDY CONSENT FORM

My name is Brent Crow and I am a graduate student at Southern Illinois University-Carbondale. I am asking you to participate in my pilot study for my dissertation research project. The purpose of my study is to determine if there is a relationship between the use of Facebook and consumption of alcohol by students at Southern Illinois University Carbondale. To participate in this pilot study you must be an undergraduate student between the ages 18-24, and enrolled at least part-time at SIUC. Participation in is voluntary and will take approximately 15 minutes of your time.

You will to the best of your ability answer the questions provide on the survey form. All your responses will be kept confidential within reasonable limits. Only those directly involved with this project will have access to the data. If you have any questions about the study, please contact Dr. Mark Kittleson at Southern Illinois University Carbondale Department of Health Education and Recreation Pulliam Hall 307 Mailcode 4632 Carbondale, IL 62901-4632, Phone: 618-453-2777, e-mail: kittle@siu.edu.

Thank you for taking the time to assist me in this research.

Print your name \_\_\_\_\_

Signature \_\_\_\_\_

Date \_\_\_\_\_

This project has been reviewed and approved by the SIUC Human Subjects Committee. Questions concerning your rights as a participant in this research may be addressed to the Committee Chairperson, Office of Research Development and Administration, SIUC, Carbondale, IL 62901-4709. Phone (618) 453-4533. E-mail: siuhsc@siu.edu

## APPENDIX F: CONSENT FORM

My name is Brent Crow and I am a graduate student at Southern Illinois University-Carbondale. I am asking you to participate in my research study. The purpose of my study is to determine if there is a relationship between the use of Facebook and consumption of alcohol by students at Southern Illinois University Carbondale. To participate in this research project you must be a current Southern Illinois University Carbondale student ages 18 and above. To examine the readability, and structure of the survey tool you are being asked to participate in a focus group. Participation in this focus group is voluntary. If you choose to participate in the focus group, it will take approximately 45 minutes of your time. You will to the best of your ability provide information on the readability, and structure of the survey tool. All reports based on this research and written by the researcher will maintain the confidentiality of individuals in the group. Only group data will be reported and no names will be used. Since a focus group involves a group process, all members of the group will be privy to the discussions that occur during the session; therefore, absolute confidentiality on the part of the participants, themselves, may be difficult to ensure. All your responses will be kept confidential within reasonable limits. Only those directly involved with this project will have access to the data. If you have any questions about the study, please contact Dr. Mark Kittleson at Southern Illinois University Carbondale Department of Health Education and Recreation Pulliam Hall 307 Mailcode 4632 Carbondale, IL 62901-4632, Phone: 618-453-2777, e-mail: [kittle@siu.edu](mailto:kittle@siu.edu).

Thank you for taking the time to assist me in this research.

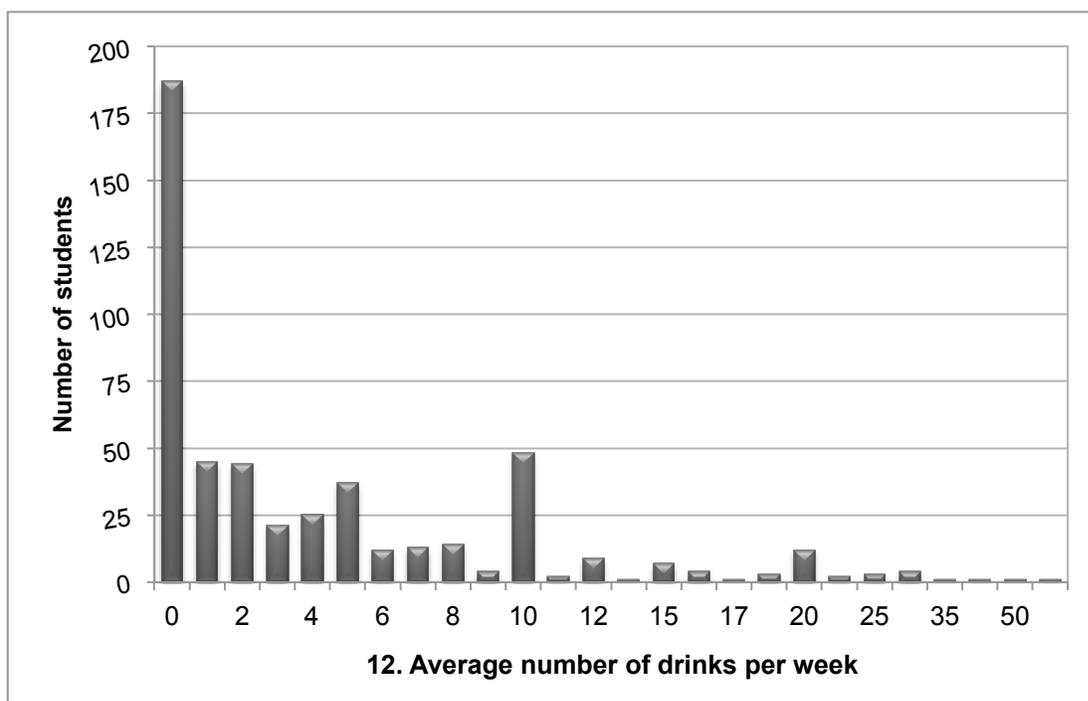
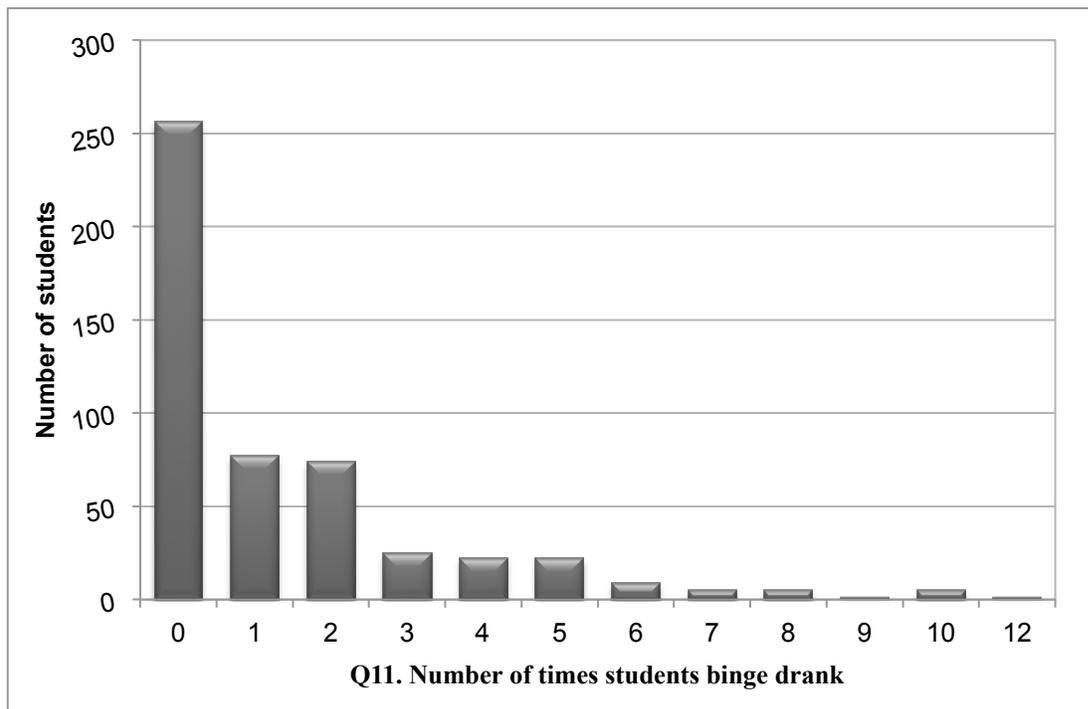
Print your name \_\_\_\_\_

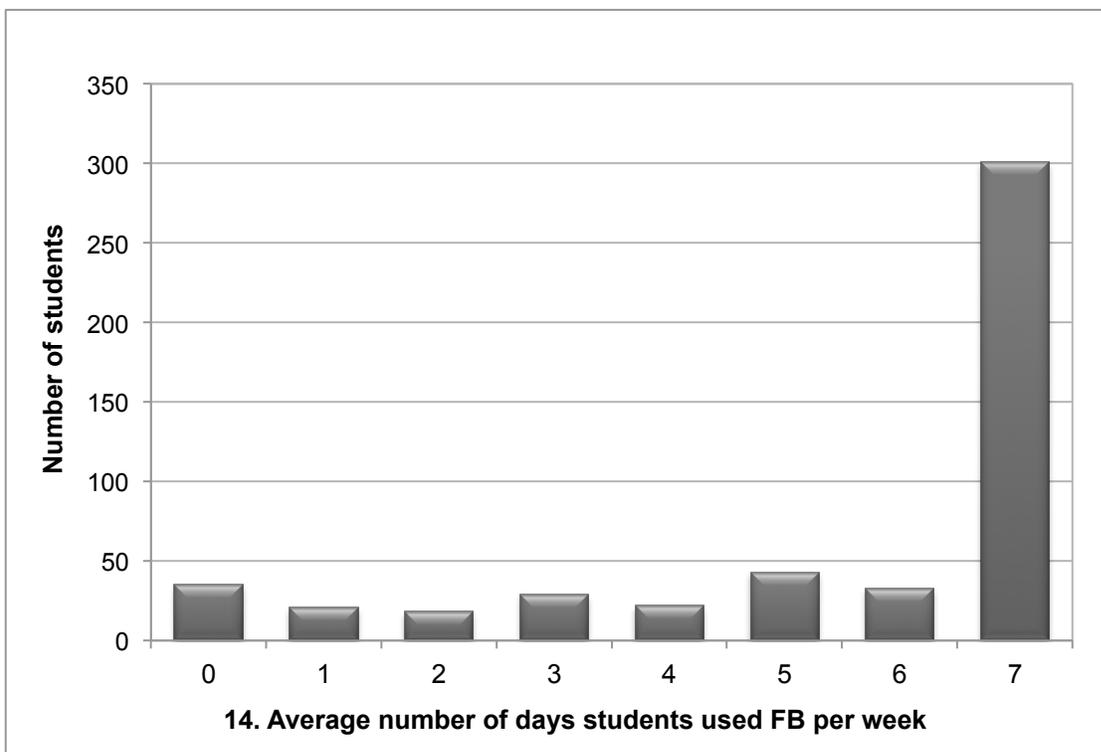
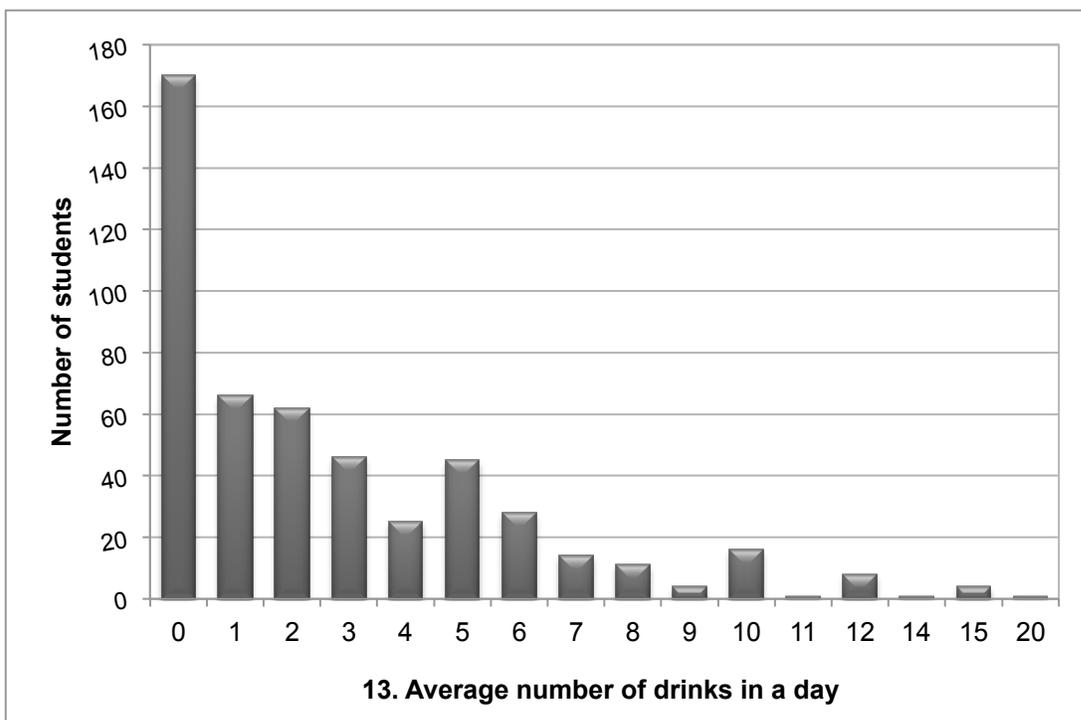
Signature \_\_\_\_\_

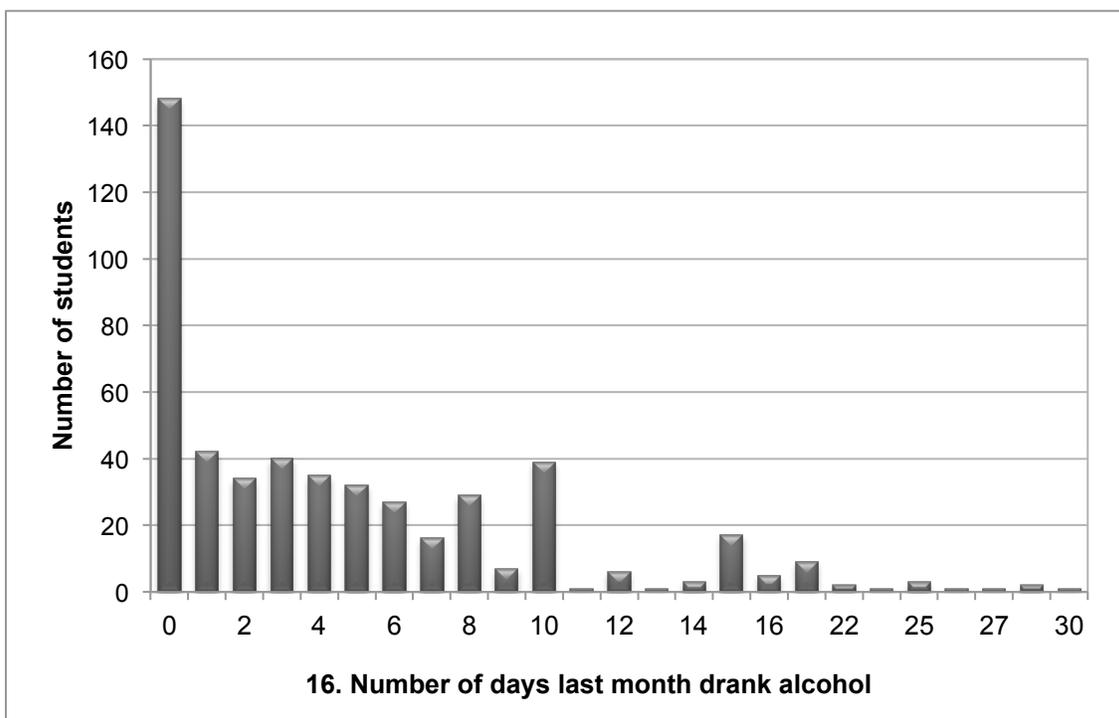
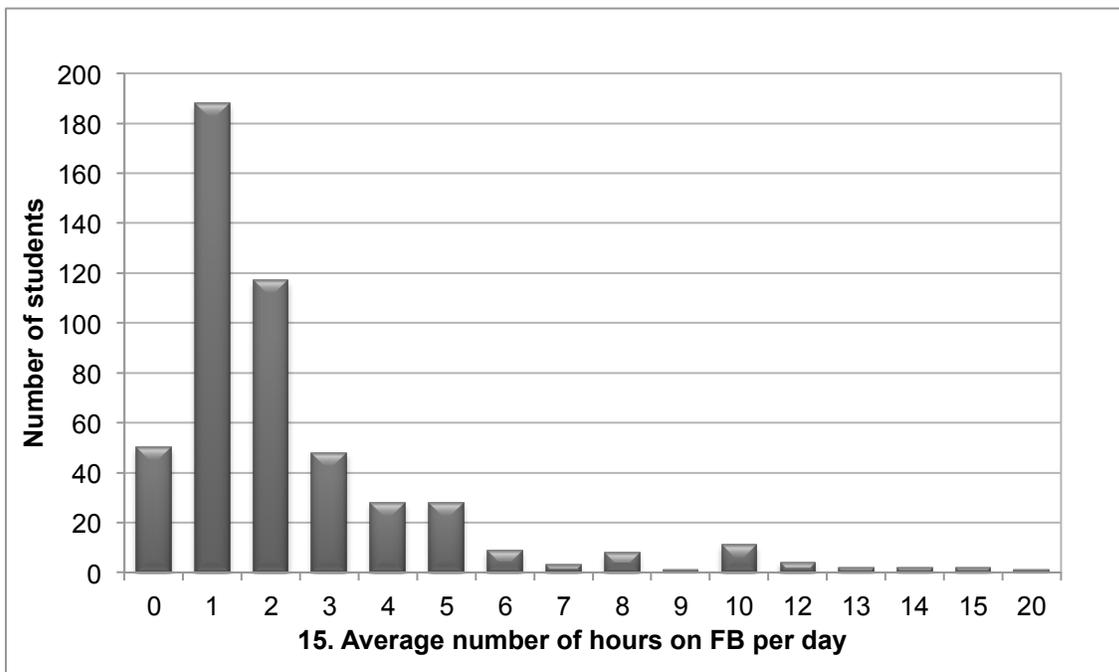
Date \_\_\_\_\_

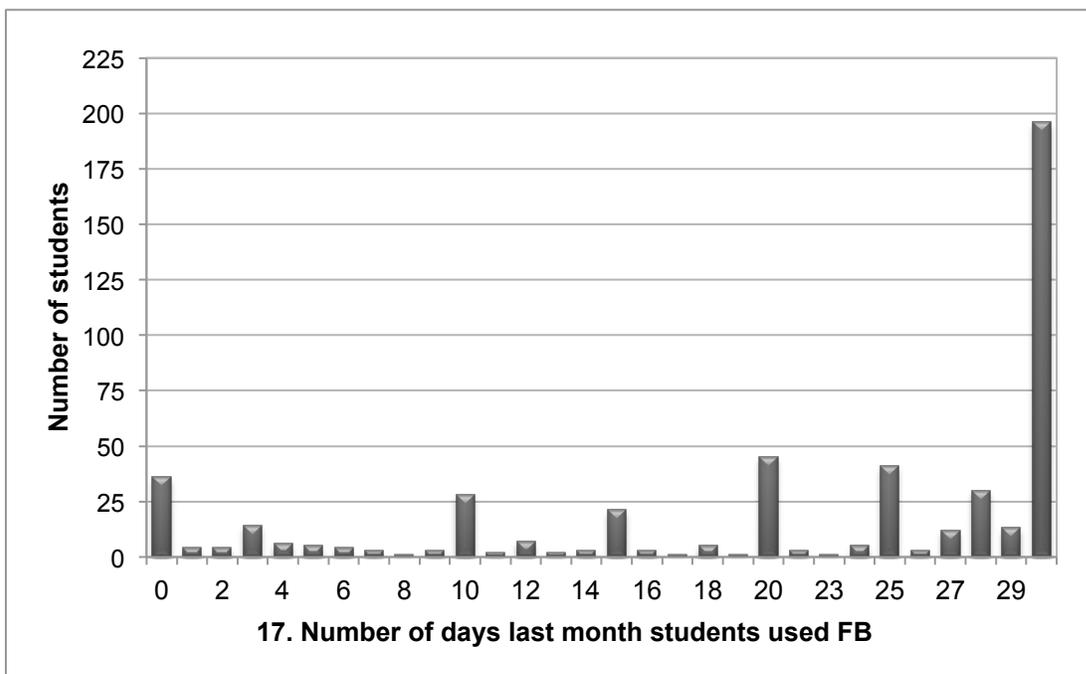
This project has been reviewed and approved by the SIUC Human Subjects Committee. Questions concerning your rights as a participant in this research may be addressed to the Committee Chairperson, Office of Research Development and Administration, SIUC, Carbondale, IL 62901-4709. Phone (618) 453-4533. E-mail: [siuhsc@siu.edu](mailto:siuhsc@siu.edu)

## Appendix G – Histograms for survey questions 11-17.









## VITA

Graduate School  
Southern Illinois University

Brent M. Crow

Email: cubmc2@aol.com

Eastern Illinois University  
Bachelor of Science, Physical Education, May 2000

Eastern Illinois University  
Master of Science, Exercise Science, August 2001

Eastern Illinois University  
Master of Arts, Gerontology, August 2003

Dissertation Title:  
Does Facebook Impact College Students' Alcohol Consumption?

Major Professor: Dr. S. Brown