

ALCOHOL AND ENERGY DRINK USE: COLLEGE STUDENT DRINKING
MOTIVES AND PERCEIVED POSITIVE REINFORCEMENT

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“The fish that keeps on swimming is the first to chill upstream”

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CHAPTER I

INTRODUCTION

The misuse and abuse of alcohol is a major concern on college campuses nationwide. Within the traditional aged college population (18-24 year olds), the trend of high risk drinking is nothing new. However, research suggests an increase in high risk drinking behaviors due to the combination of alcohol and energy drinks (O'Brien, McCoy, Rhodes, Wagoner, Wolfson, 2008; Woolsey, Waigandt, & Beck, 2010).

According to a 2002 study, O'Malley and Johnston reviewed findings from several national data sets which examined alcohol use among students including: The College Alcohol Study, The Core Institute, Monitoring the Future, and The National College Health Risk Behavior Survey. Results of these national surveys are consistent indicating that approximately 70% of college students report using alcohol in the past month and about 40% report binge drinking. In 2008, more than three-fourths of college students reported alcohol use in the past month (American College Health Association, 2008).

Despite increased prevention efforts within the past 15 years, the misuse and abuse of alcohol has not declined. Hingson, Heeren, Zakocs, Kopstein, and Wechsler (2001) found that the frequency of binge drinking among college students has remained nearly the same since 1993. In spite of increased efforts to prevent alcohol misuse among

college students, the prevalence of binge drinking remained fairly stable between 1993 and 2001, and the prevalence of frequent binge drinking (3 or more times in the past 6 weeks) increased from 19.7% to 22.8%. In 2000, 40% of all two and four year college students reported binge drinking at least one time in the past two weeks (Johnson, O'Mally, & Bachman, 2000).

Many age groups show signs of misuse and abuse of alcohol; however, the 18-24 year old age group shows the highest usage rates and the most problems associated with alcohol use (Ham & Hope, 2003). Problems from misusing alcohol have been well documented. According to the National Institute on Health (NIH) there are an estimated 1,400 deaths each year from unintentional injuries associated with unsafe drinking behaviors (NIH, 2002). Hingson et al., (2001) found that up to 500,000 college students are unintentionally injured each year as a result of being under the influence of alcohol and college students are involved in 1100 traffic and 300 unintentional non-traffic related deaths per year. Furthermore, up to 28% of college students report driving drunk in any given month (Hingson et al., 2001). Research shows that students who engage in unhealthy drinking habits are exposed to lower prospects for employment out of college as well as lower incomes throughout their lifetime (Jennison, 2004). According to Jennison (2004), "the literature indicates that college students who drink heavily are less likely than other students to have successful college careers; and if they do graduate, they are less likely to obtain white-collar employment or career advancement" (p. 662). Students who exhibit unhealthy drinking habits are more prone to lower levels of intimacy and interpersonal interactions, as well as higher levels of stress and depression (Murphy, McDevitt-Murphy, & Barnett, 2005).

Assaults, physical violence, and aggression are common problems on college campuses (NIH, 2002). Turrisi, Mallett, Mastroleo, and Larimer (2006) suggest that those who drink alcohol are more likely to be involved in verbal and physical confrontations involving pushing and hitting (Turrisi et al., 2006). Ford (2007) suggested that up to 66% of college students engage in drinking behaviors that may lead to physical violence.

Unwanted sexual contact has also been found to increase when one engages in binge drinking behavior. Students who choose to engage in heavy drinking behaviors are twice as likely to have had multiple sexual partners as those who exhibited lower drinking behaviors in the past month (NIH, 2002). It is not always the perpetrator of the sexual abuse who is under the influence of alcohol. Alcohol consumption by the victim appears to be a predisposing factor for sexual abuse to occur. Victim intoxication can lead to less forceful victim resistance and a higher risk of being raped (Ullman & Karabatsos, 1999).

The dangers of alcohol use alone are numerous and alarming. Evidence suggests that the new trend of mixing alcohol with energy drinks makes alcohol even more dangerous (O'Brien et al., 2008; Woolsey, 2007; Woolsey, Waigandt, & Beck, 2010). In 1987, Red Bull was introduced in Australia and was the first bottled energy drink released for consumption. After gaining popularity, Red Bull was canned and released in the United States in 1997. Red Bull, the drink that claims to "give you wings" has been growing in popularity ever since. In 2000, Red Bull sales alone rose from nearly 1 billion cans to over 3 billion in 2006 (Red Bull GmbH, 2008). Since the inception of Red Bull, more than 500 new brands of energy drinks have been introduced to the market with sales estimated to total \$5.4 billion world-wide in 2006 (Agriculture; Packaged Facts, 2007).

North America accounted for approximately \$3.5 billion of this total (Reissig, Strain, & Griffiths, 2009; Packaged Facts, 2007). These energy drinks are marketed towards young adult consumers (Malinauskas et al., 2007).

In the basic energy drinks such as Red Bull, the stimulant and euphoric effects are felt from the main ingredients of caffeine, glucuronolactone (i.e., glucose), taurine, B-complex vitamins, inositol, panthenol, and niacin (Oteri et al., 2007). In newer brands of energy drinks such as Redline, more exotic and powerful herbal compounds have been introduced to make drinks stronger as well as possibly more dangerous to consumers. Energy drinks now contain herbal stimulants such as guarana, yerba mate, ginseng, N-Acetyl-L-Tyrosine, and powerful stimulants such as yohimbine HCL and evodiamine. Yerba mate and guarana are natural forms of caffeine, but are not included in caffeine content calculations because they are unstandardized, meaning that the milligram strength varies by source (Woolsey et al., 2010). Energy drinks use cocktails of herbal ingredients making it difficult to judge their relative strength and potential health dangers (Woolsey, 2007).

Although the rapid increase in energy drink consumption may be alarming, new increases in the caffeine levels and unregulated herbal stimulants (e.g., yohimbine HCL) pose a more immediate health threat to consumers (Woolsey et al., 2010). For example, energy drinks such as Cocaine (280mg/8.4oz) and SPIKE Shooter (300 mg/8.4oz) contain caffeine levels roughly 3-4 times higher per ounce than a traditional 8.3 oz Red Bull at 80mg (Woolsey, 2007; Walker & Woolsey, 2009). People perceive that energy drinks are 'generally recognized as safe' because they are commonly sold and advertised,

but energy drinks and the herbal ingredients found within them are unregulated by the FDA in the United States. (Food and Drug Administration, 2003; Woolsey et al., 2010).

It is estimated that 34% of the 18-24 year old population regularly consumes energy drinks (Energy Drinks, 2007). Malinauskas et al. (2007) found that 51% of college students reported drinking at least one energy drink per month. Each year, energy drink companies more aggressively target and market their products to this population. Red Bull student managers are recruited to give away free samples and gather information about the campus culture to better tailor marketing efforts (O'Brien et al., 2008). The alcohol industry has recently been criticized for promoting the combination of alcohol and energy drinks. Drinks such as Red Bull Vodka and Las Vegas & Jager "Bombs" have become very popular in college drinking environments (Simon & Mosher, 2007). The combination of alcohol mixed with energy drinks has been shown to produce increased negative consequences. Previous studies suggested that the combination of alcohol and energy drinks produces more risk taking and negative consequences than the ingestion of alcohol alone (McCoy, Rhodes, Wagoner & Wolfson, 2008; Oteri et al., 2007; Woolsey, 2007).

In a study with 2,886 college drinkers from 10 universities in North Carolina, 24% of students who drank in the past 30 days consumed alcohol mixed with energy drinks (O'Brien et al., 2008, McCoy, Rhodes, Wagoner, Wolfson, 2008). Furthermore, in a study with 315 college student-athlete drinkers, Woolsey (2007) found that 48% had combined alcohol and energy drinks in the past year, with nearly all of these athletes reporting combining on a weekly basis. O'Brien et al., (2008) found that alcohol mixed with energy drinks leads to significant increases in alcohol related consequences such as

being taken advantage of sexually, riding with an intoxicated driver, being hurt or injured, and requiring medical treatment. Furthermore, it is alarming that participants also reported lower feelings of intoxication while mixing alcohol and energy drinks (O'Brien et al., 2008).

Research indicates that energy drink use without alcohol is also linked to an increase in risk taking behaviors (Miller, 2008a). In a survey of 602 undergraduate students, Miller (2008b) found the frequency of energy drink consumption was positively associated with marijuana use, sexual risk-taking, fighting, seatbelt omission, and taking risks on a dare. Additionally, energy drink use was positively associated with smoking, drinking, alcohol problems, and illicit prescription drug use (Miller, 2008b). It is important that researchers continue to examine energy drink use as it could potentially have a gateway effect to increased alcohol consumption and the use of more powerful stimulants, which may produce more negative effects (Woolsey et al., 2010).

Horne and Reyner, suggest that caffeinated cocktails could lead to an increase in traffic accidents (1995; 1999). When combining alcohol and energy drinks students were more at risk of being taken advantage of sexually and reported being injured twice as much as those who did not combine. The combination of alcohol and energy drinks appears to effect the users' self-judgment and perceptions of intoxication in others (O'Brien et al., 2008). Those who combine alcohol and energy drinks report higher negative consequences, but they also report feeling less tired and more pleasure. These pleasurable factors include less headaches, weakness, dry mouth, and increased motor coordination (Ferreira et al., 2006). Perhaps feeling more alert and experiencing more pleasure causes users to take more risks and make poor health decisions. It was found that

the students who reported combining alcohol and energy drinks were twice as likely to get in a car with an intoxicated driver (O'Brien et al., 2008).

Although only a few studies have looked at the effects of mixing energy drinks and alcohol, governmental organizations are beginning to recognize the dangers. In 2007, the United States Food and Drug Administration issued a warning to the makers of 'Cocaine', a brand of energy drinks, citing marketing violations and portraying its product as a street drug alternative (Cruse, 2007). Perhaps the combination of aggressive marketing towards the college population and better palatability when mixed with alcohol, could lead youth to a higher consumption of alcoholic beverages (Ferreira, 2006). It has been suggested that those who combine alcohol and energy drinks are at a higher risk for consequences; however, much more research is necessary to develop effective prevention and intervention programs. Students report more negative consequences when combining alcohol and energy drinks; therefore, why do so many continue to engage in this activity? Perhaps drinking motives and students perceptions of the associated positive consequences are two important factors in to understanding this drinking paradigm.

Motivations and reasons for drinking give important information about why students are choosing to use alcohol. By identifying the choices that students are making and why they are making them, health educators can create better alcohol education and prevention programs. According to Kuntsche, Knibbe, Gmel, & Engles, (2006) drinking motives are the final decision that one must make in regards to using alcohol or not. These decisions to drink are mediated by distal influences such as past experiences, future expectancies, and personality factors (Catanzaro & Lurnet, 2004; Cox & Klinger,

1988). According to Woolsey (2009), an important factor to consider in developing alcohol & drug education and prevention programs is how peoples' personality traits and ways of thinking influence their health behavior choices and motivations. For example, if a person has low confidence levels, and alcohol or energy drinks allow or cause them to feel more confident, then their motivation to use these substances will be positively reinforced. The Motivational Model of Drinking developed by Cox and Klinger (1988) suggests that individuals drinking motives are the most important factor for understanding why they engage in drinking. This is based on an expected reward system with four factors: positive reinforcement (positive outcomes), negative reinforcement (negative outcomes), internal (personal changes), and external (social environment changes). These factors merge with one another to influence individuals' motivations to drink or abstain (Kuntsche & Steward, 2009). These motives can be measured by determining how much an individual values the related effects and consequences of alcohol, which is what a person wishes to happen by using alcohol (Cooper, 1994). People have varying motives for drinking alcoholic beverages and experience different outcomes while drinking (Jensen et al., 2002; Klein & Pitman, 1990). Drinkers' expectations for positive outcomes from the combined-use of alcohol and energy drinks may produce more positive motives (i.e., reasons) for engaging in this drinking behavior. These motivations for drinking alcohol and using energy drinks give researchers a good idea of users' present drinking behaviors and can also help predict future drinking behavior (Miller & Carroll, 2006). In predicting alcohol and drug use, understanding peoples' motivations for using these substances is essential to developing effective prevention and treatment programs (Miller & Carroll, 2006).

Individuals self-reported motivations for using substances also predicts the behavioral outcomes of a drinking episode (Miller & Carroll, 2006). Negative outcomes from drinking alcoholic beverages have been well documented (Hingson et al., 2001; Jennison, 2004; NIH, 2002). Furthermore, combining alcohol and energy drinks has been shown to increase negative consequences (Ferreira et al., 2006; O'Brien et al., 2008; Woolsey, 2007). However, very little research has been conducted to study the perceived positive reinforcements that are derived from drinking alcohol and none have been conducted on combined use (Corbin, Morean, & Benedict, 2008; Park, 2004; Park and Grant, 2005). Examining the perceived positive reinforcements that are associated with drinking in the college population may be beneficial in determining why college students drink in the patterns which they do (Park, 2004).

In the college drinking atmosphere, positive outcomes may be more predominant than negative outcomes, especially when examining the immediate positive reinforcement of drinking behaviors. Based on B.F. Skinner's Operant Conditioning learning theory, those who experience more positive outcomes with few negative outcomes may be more likely to continue to use alcohol in an unhealthy manner (Corbin, Morean, & Benedict, 2008). In a 2004 study focused on college student drinking consequences, subjects reported more perceived positive reinforcements on a more extreme and frequent basis than negative consequences (Park, 2004). Examples of positive outcomes include such items as making others laugh, an increase in energy, feeling confident, higher intensity of a sexual experience, acting out a sexual fantasy, or a decrease in stress level (Corbin, Morean, & Benedict, 2008). Because only a small, limited, number of studies have focused on the extent of positive consequences when

drinking within a college population, the extent that these perceived positive reinforcements play in drinking behavior has not been established (Park & Grant, 2005). However, previous research has shown a link between positive expectancies and motivation (Janis & Mann, 1977; Martens, Rocha, Martin, & Serrao, 2008). It has been suggested that perceived positive reinforcements be examined as an effective tool to help drinkers move towards healthier behaviors (Corbin, Morean, & Benedict, 2008). When energy drinks are combined with alcohol, users perceive that energy drinks reduce the unwanted negative effects of alcohol, such as reduced feelings of impairment, dizziness and clumsiness (Ferreira et al., 2006; Woolsey, 2007). However, no published research has specifically examined the possibility of increased perceived positive reinforcements from the combination of alcohol and energy drinks.

Research such as this may have a valuable and long lasting effect on the future of health education. Uncovering the motives and perceived positive reinforcements related to the combined use of alcohol and energy use may help health educators in better designing and implementing a more modern day approach to drug and alcohol education health programs. One of the new approaches in health behavior change that has been shown to be particularly effective for drug and alcohol education is to use the counseling principles of Self-Determination Theory (SDT) and Motivational Interviewing. Motivational Interviewing and SDT recognize the importance of utilizing a person's past experiences and motivations to help them better foster an environment where health behavior change can be found (Dimeff, Baei, Kivlahan, & Marlatt, 1999; Ryan, Patrick, Deci, Williams, 2008). Past research has suggested that looking at motivation and perceived positive reinforcements of health behaviors combined with the use of the SDT

has had positive effects on tobacco cessation, physical activity, and dental hygiene (Fortier, Sweet, O'Sullivan, Williams, 2007; Munster & Halvari, 2006; Williams et al., 2006).

Statement of the Problem

The negative consequences of alcohol use within the college student population have been well documented. These consequences range from short term (e.g., feeling ill, hangover) to long term (e.g., poor academic performance, lower quality of life). Despite the reported increases in negative consequences with combined-use, college students continue to engage in these unhealthy drinking behaviors and it appears that energy drink use continues to increase along with more negative consequences.

With the introduction of Red Bull in the United States in 1997, energy drinks quickly gained popularity and have since then continued to grow at an exponential rate. Energy drink manufacturers have specifically targeted college students with the direct intention to take advantage of this group which has already been identified as an at-risk drinking group (Woolsey et al., 2010). More concerning than merely targeting this population, is the fact that energy drink companies give out free samples of their products to students and have provided most college bars with free energy drink machines or promotions. Studies have documented and continue to show that many college students are now combining energy drinks with alcohol (O'Brien et al., 2008; Woolsey, 2007; Woolsey, Kensinger, & Jacobson; 2009). These studies suggest when two potentially addictive substances (alcohol & stimulants found in energy drinks) were combined there was an increase in negative consequences experienced by the user.

Despite the reported increases in negative consequences and increased knowledge base the potentially adverse affects of energy drinks, college students still continue to

engage in this practice. To fully understand this paradigm and to develop effective comprehensive prevention programs, researchers have suggested that drinking motivations and perceived positive reinforcements should be studied (Corbin, Morean, & Benedict, 2008; Martens et al., 2008; Park, 2004; Park & Grant, 2005). A large body of research has examined alcohol drinking motives, but very few have investigated perceived positive reinforcements. Currently, no research on the combination of alcohol and energy drinks has specifically examined drinking motives and/or perceived positive reinforcements or the relationship of these to quantity and frequency measures.

Purpose of the Study

Increased negative consequences are associated with the combined use of alcohol and energy drinks (Ferreira et al., 2006; O'Brien et al., 2008; Woolsey, 2007). Despite this, one large study found that almost one quarter of college students engage in this behavior (O'Brien et al., 2008). Why do college students still engage in this dangerous behavior? The purpose of this study is to investigate differences in drinking motives and perceived positive reinforcements among college student populations comparing when they drink alcohol alone to when they combine alcohol and energy drinks. This study also examines gender differences in this behavior as well as correlations between drinking motives and perceived positive reinforcements.

Null Hypotheses

- Ho1: There will be no significant differences in reported Drinking Motives scores between students who consume alcohol-only and those who combine alcohol and energy drinks.
- Ho2: There will be no significant differences in reported perceived positive reinforcement scores between students who consume alcohol-only and those who combine alcohol and energy drinks.
- Ho3: Within combined users there will be no significant difference in reported Drinking Motives scores when they consume alcohol only compared to when they combine alcohol and energy drinks.
- Ho4: Within combined-users there will be no significant difference in reported Perceived Positive reinforcement scores when they consume alcohol-only compared to when they combine alcohol and energy drinks.
- Ho5: There will be no significant difference between males and females in reported Drinking Motives score within combined-users.
- Ho6: There will be no significant difference between male and females in reported Perceived Positive Reinforcement scored within combined-users.
- Ho7: There is no relationship of the reported average amount of alcoholic drinks consumed on one occasion and Perceived Positive Reinforcement scores in combined-users when they use alcohol-only.
- Ho8: There is no relationship of the reported average amount of alcohol consumed on one occasion and Perceived Positive Reinforcement scores in combined-users when they combine alcohol and energy drinks.

Significance of Study

Currently, no published research exists that specifically explores drinking motives and perceived positive reinforcements associated with combining alcohol and energy drinks. Uncovering what motivates one to engage in combined-use and their perceptions of the resultant perceived positive reinforcements they derive, will serve as valuable information to health educators in designing new effective prevention and treatment programs. Finding the differences between groups will help construct programs tailored to college students and young adults.

Assumptions

The following assumptions were made in regards to this study:

1. Participants read and fully understood the directions and items on the survey.
2. Participants answered each question honestly and to the best of their ability.

Limitations

The following limitations were made in regards to this study:

1. All subjects in this study were volunteers. These volunteers came from a convenience sample from multiple college campuses. Therefore, those who chose to participate may have answered the questions differently than those who did not decide to volunteer for this study.
2. The measures were all self-reported by the volunteers. Although informed by the investigator that all answers would be confidential, subjects may have answered questions only to the extent that they felt was socially acceptable.

Delimitations

The following delimitations were made in regards to this study:

1. Male and female participants were currently enrolled in a college or university at the time of the study.
2. Results of drinking motivations were measured using the Drinking Motives Questionnaire-Revised (Cooper, 1994).
3. Results of perceived positive reinforcements were measured using the Positive Drinking Consequences Questionnaire (Corbin, Morean, & Benedict, 2008).

Definitions

Alcohol mixed with energy drinks- The mixing of an alcoholic beverage and energy drink together to make a single drink or shot (Ferreira et al., 2006).

Binge Drinking- Binge drinking refers to the ingestion of a large amount of alcohol in a short period of time. This is five drinks for males and four drinks for females in one sitting (drinking occasion) (Wechsler, Lee, Kuo, Seibring, Nelson & Lee, 2002).

Combined-use – Energy drink use within plus or minus two hours of consuming alcohol (Woolsey, Kensinger, & Jacobson, 2009). Some studies look solely at the mixing of energy drinks with alcohol. Whereas the previous study at OSU examines combined-use in a holistic view because many consume energy drinks while drinking alcohol but do not use them as a “mixer” (e.g., Red Bull Vodka).

Drinking Motives- Motivations that propel one to either engage in drinking behavior or to abstain from drinking. These include personal past experiences, personal and situational expectancies, and reward systems (Kuntsche & Stewart, 2009).

Energy Drinks- These are drinks that claim to give the user a burst of energy by using the combination of various stimulus based ingredients such as caffeine, plant-based stimulants, sugars, glucuronolactone, amino acids, herbs, and vitamins, among others (Ferreira et al., 2006; O'Brien et al., 2008,). There are a number of energy drinks currently being marketed with varying ingredients; however for the purpose of this study any drink that that meets this criterion will be considered one standard energy drink.

Negative Drinking Consequences- Problems associated and brought on by drinking. This may include such problems as personal injuries, unplanned and unwanted sexual activity, legal problems, and struggles in academics (Park & Grant, 2005).

Perceived Positive Reinforcements- Real life positive outcomes or reinforcements experienced by the subject while drinking alcohol or the combination of alcohol and energy drinks that are perceived as being positive (Corbin, Morean, & Benedict, 2008).

CHAPTER II

REVIEW OF THE LITERATURE

College Alcohol Use

Drinking alcohol has been a part of many college students lives. As far back as the middle ages, ‘hoodigan-scholars’ have been reported to misuse and abuse alcohol (Vicary & Karshin, 2002). Although not all students’ misuse and abuse alcohol, the majority do engage in drinking behavior with almost half of college students reporting they engage in binge drinking (Haines & Spear, 1996; Wechsler, lee, Kuo, & Lee, 2004). The trends associated with college drinking behavior differ between the types, location, and size of the institution (Presley, Meilman, & Lyera, 1995; Vicary & Karshin, 2002; Wechsler, Dowdall, Davenport, & Rim, 1995). For example, in a study by Presley et al., 42% of college students reported binge drinking in the last two weeks, white students have been shown to have the highest rate of binge drinking episodes in a two week period as compared to their Native American, African American, Hispanic, and Asian counterparts (1995). Weschler et al. (1994) reported that colleges and universities in the south and west have lower rates of binge drinking than parallel institutions in the northeast and north central parts of the United States.

For many students excessive and dangerous drinking behavior in college represents a rite of passage. In the college age group, students 18-21 years old are seen to

have the highest rates of alcohol consumption, making a large amount of this behavior illegal (Vicary & Karshin, 2002). As an entirety, the college age group (18-24) shows the highest rates of alcohol consumption out of all other age groups (Fromme, Marlatt, Baer, & Kivlahan, 1994). During the school year, 85 to 93 percent of college students report drinking at least once in the previous 30-day period. Of college drinkers surveyed in 1997, 20 to 52 percent were classified as heavy or binge drinkers. These percentages vary depending on the size and location of the institution (Core Institute, 2000; Johnson et al., 1997).

Problems Associated With Alcohol Use

Numerous studies have identified problems associated with alcohol use, especially in the college age group. Bruises, bumps, falls, and cuts are examples of minor problems as a result of drinking. These are just some of the 500,000 unintentional injuries that occur annually when college students drink too much (Turrisi et al., 2006). The NIH (2002) suggests that many other college students experience internal injuries as well. Most of these are short term in nature and are the bodies' way of telling them they had too much to drink such as hangovers, nausea, and vomiting.

Other injuries are more long term in nature such as resistance to infection, an increased vulnerability to lifelong alcohol dependence and cirrhosis of the liver. More severe consequences can be blackouts where the drinker experiences memory lapses or gaps in events. In students who reported being occasional (less than three or more times in the last two weeks) binge drinkers, 27% reported in blacking out at least once in the last year while the numbers climb to 54% for frequent (three or more times in the past two weeks) binge drinkers (NIH, 2002). Among students that do remember what

happened while drinking, many report being insulted, getting in an argument, being assaulted, acting too sexually aggressive, and/or being raped (Weschler et al., 2002). A very serious problem when college students drink is drunk driving. A study by Hingson et al. (2001) found that in any given month 28% of students reported driving while intoxicated and 39% of students reported being a passenger in a car with a drunk driver.

Research by Walters & Bennet (2000) suggests that heavy drinkers underestimate both their amount of consumption as well as level of drunkenness while underestimating how much their peers drink. Because of this, they are less likely to change their behavior because they view their amount of consumption and problems associated with alcohol use as 'normal' compared to their peers (Agostinelli & Miller, 1994; Prentice & Miller, 1993). This heavy drinking as well as misuse and abuse of alcohol leads to college students being put a higher risk for experiencing problematic alcohol related consequences (Ham & Hope, 2003). Moreover, the higher frequency at which this heavy drinking occurs has been associated with a greater amount of consequences (Martens, Rocha, Martin, & Serrao, 2008; Weschler, 2000).

Alcohol Advertising

Although the legal age to drink alcohol in the United States is 21, research suggests that alcohol is marketed to a younger audience. By the end of eighth grade 41% of students report that they have tried alcohol and 20% of those report being drunk (Johnson et al., 2006). Students who start drinking before the age of 15 are significantly more likely to have future drinking problems and may drink heavily during college (Hingson, 2007). In a sample of 1080 middle school students 12% had a favorite alcohol advertisement (e.g., Animated Budweiser frog commercial) while 29% owned or wanted

a promotional alcohol item (Henriksen, Feighery, Schleicher, & Fortmann, 2007). Marketing alcohol to youth is nothing new. Before television commercials and radio advertisements, the brewing industry decided to begin to design their alcohol ads and products to appeal to youth (Jackson, Hastings, Wheeler, Eadie, & Mackintosh, 2000). Popular and social media has propelled alcohol marketing, especially to the college population. Advertising theory suggests that repeated exposure to advertisements promotes positive effect to the marketing as well as the brands of alcohol (Batra, 1986). Showing college aged people engaging in fun activities while drinking helps students to relate to the advertisement and identify with individual characteristics (Chen, Grube, Bersamin, 2005).

Research into whether or not the alcohol marketing influences the college aged population to drink is debatable. When citing research, alcohol companies cite economic studies that look at the relationship between dollars of alcohol sales and dollars of alcohol advertising suggest that advertising has little or no effect on sales (Hastings, Anderson, Cooke, & Gordon, 2005). Studies by Duffy (1989 & 1991) suggested that the effect of alcohol advertising was barely measurable while Nelson (1999 & 2003) found that there was limited significance to alcohol consumption and demand in terms of advertising.

Research into consumer studies which examine a person's knowledge, behaviors, and attitudes in relation to exposure to alcohol advertising are conflicting. Studies by Strickland (1982) found no direct linkage between exposure to alcohol advertising and consumption. A second study on 12-16 year old drinkers (N = 772) by Strickland in 1984 confirmed his previous research findings. This study found that there were meager effects on the levels of consumption in relation to alcohol advertisements. Atkin, Hocking, &

Block (1984) in their study found that there was a positive relationship between exposure to alcohol advertisements and drinking behavior. They also found that those who reported high levels of advertisement exposure, but did not drink yet, were more likely to become drinkers in the future. A longitudinal study by Casswell and Zhang (1998) on the 18-21 year old age group suggested a significant relationship between alcohol advertising and brand allegiance to beer consumption. Those students at age 18 who reported liking alcohol advertisements were more likely to drink at age 21. Liking these advertisements did not influence drinking at age 18, however having a brand allegiance did.

Further, Stacy, Zogg, Unger, & Dent (2004) found that in a sample of 2,250 seventh graders, with an increase of viewing television alcohol advertisements, 44% reported an increased risk of beer use. A study by Connolly, Casswell, Jia-Zhang, & Sylvia (1994) found that young males who drank beer were targeted by beer advertisers and more likely to be appreciative of their ads (as cited in Hastings et al., 2005).

Due to conflicting studies, it may be hard to assess if alcohol advertisements influence young people's drinking. Research by Erenberg & Hacker (2005) and Christie et al. (2001) suggest that it may be the way alcohol is marketed and priced. Specials in college towns such as 'happy hours', 'ladies nights', 'penny beers' and 'buy one get one free' encourage more consumption of alcohol (Hastings et al., 2005). These special priced drinks have shown an increase in consumption and problem drinking (Christie et al., 2001; Cooke, Hastings, Wheeler, & Eadie, 2001).

Energy Drink Use

The first energy drink was launched in 1987 in Australia under the name of Red Bull. Ten years later Red Bull arrived in the United States. Since this time energy drink

use has rose dramatically. Red Bull sales figures report selling 1 billion cans in 2000 and over 3 billion in 2006 (Red Bull GmbH, 2008). Partially attributed to the success of Red Bull, over 500 new energy drinks have been created with sales totaling \$5.4 billion worldwide in 2006, with the North America accounting for \$3.5 billion of this (Reissig, Strain, & Griffiths, 2009; Packaged Facts, 2007). These products are marketed to the 18-35 year old population, but little research has been conducted on their consumption patterns of energy drinks (Malinauskas et al., 2007).

A limited amount of studies suggest that college students are regularly consuming these energy drinks as part of their daily beverages. A study by O'Brien et al. (2008) randomly sampled 4,271 college students with an average age of 20.4 years throughout ten universities in North Carolina (8 public and 2 private). Campus size ranged from 5,375 to 44,841 students. These researchers found that 24% of college aged combined-users combined alcohol and energy drinks at least once in the past 30 days. These finds are fairly consistent with other studies.

Malinauskas et al. (2007) surveyed 496 college students from the Central Atlantic region of the United States. Results indicated that 51% ($n = 253$) of students reported drinking at least one energy drink each month in the past semester. Of energy drink consumers, a higher percentage of females drank energy drinks as compared to males (53% vs. 42%). A variety of reasons were cited for using energy drinks. Insufficient sleep, a need for energy, studying or a major project, driving for an extended period of time, to mix with alcohol, and/or to treat a hangover were all top reasons reported by both sexes.

Ingredients in Energy Drinks

Consumers perceive that energy drinks are 'generally recognized as safe' because they are commonly sold and advertised; however, energy drinks and the herbal ingredients found within them are unregulated by the FDA in the United States (Food and Drug Administration, 2003; Woolsey, 2009). These drinks contain many ingredients that have harmful side effects if taken in large amounts and in conjunction with other substances (Oteri et al., 2007). The most basic energy drinks (i.e. Red Bull) derive their stimulant effects mainly from caffeine. Besides containing addictive herbal stimulants and drugs (e.g., caffeine), research suggests that stimulants found in energy drinks cause the release of the same neurotransmitters (dopamine, norepinephrine, serotonin) as other stimulant drugs of abuse (Lubman, Yücel, & Hall, 2007; Miller & Carroll, 2006; Woolsey, 2009). Other ingredients are added such as taurine, inositol, and B-vitamins. Newer energy drinks combine these substances with substances such as guarana, yohimbine, and evodiamine (Woolsey, 2009).

Standard and Herbal Caffeine

Caffeine is a stimulant drug that is found in many popular beverages in varying amounts. Caffeine is the most commonly used psychoactive substance in the world (Babu, Church, & Luwander, 2008). Many energy drinks contain large amounts of this stimulant, up to five times more than that of regular coffees and teas. According to Finnegan (2003) caffeine ingestion among regular adult caffeine users ranges by individual from 214mg per day to 400mg per day. Dosages of approaching 500 mg and over per day can be dangerous, especially in those with lower bodyweights (Hasenfratz & Battig, 1994; Ressig, 2009). The half-life of caffeine is between 4 to 6 hours and may be

longer depending on age, sex, liver and kidney functioning (Kaplan, Greenlatt, & Ehrenberg, 1997). Due to the wide spread use of caffeine in many beverages, in 2004, caffeine was removed from most athletic banned substance lists. This occurred because research indicates that the positive performance enhancing effects of this drug are outweighed by negative side effects such as anxiety and dehydration (Childs & DeWit, 2006; Desbrow & Leveritt, 2007; Woolsey, 2009).

Guarana is an unstandardized form of caffeine. This South American herb has been popular for many years in to people in its native habitat as a source of energy. This plant is often added to energy drinks as a form of caffeine. One gram of gaurana is equivalent to 40mg of caffeine. The nature and stimulant effects of this plant are not well understood (Finnegan, 2003). The duration of time which gaurana is processed through the body is much longer than that of regular caffeine (Babu et al., 2008). Cannon, Cooke, & McCarthy (2001) report that overdosing on gaurana may be fatal. The death of an Australian woman was blamed on the stimulant effects of this plant as she drank a beverage with a guarana content assessed to be equivalent to 35 cups of coffee.

Caffeine levels in energy drinks are much higher than those found in other beverages. McCusker, Goldberger, & Cone (2007) analyzed the caffeine content in many popular beverages, including energy drinks. Analysis yielded that in popular caffeinated sodas the caffeine content was between 18.0 to 48.2 milligrams per serving. Results from the sample of energy drinks showed that the caffeine content in these drinks were between 33.3 to 141.1 milligrams per serving. The Food and Drug Administration has regulated the caffeine content of soda at 65 milligrams per 12oz. serving; however energy drinks have no such regulation.

Vitamins and herbal substances

Taurine is an abundant amino acid that is found in the central nervous system and has many physiological functions such as the formation of bile salts, modulation of calcium flux and neuronal excitability, neuroprotection, and neuromodulation (Huxtable, 1992). In the body, taurine influences eye health, heart rhythm and functioning, and biliary health (Babu et al., 2008). A person ingests taurine naturally through a diet rich in milk, seafood, and meat (Finnegan, 2003). The daily intake of taurine in humans is 40mg-400mg per day. Regular consumption of energy drinks may raise this level to 4,000mg per day (Australian New Zealand Food Authority, 2001). Only a small body of literature suggests that the intake of taurine is risky to humans (Finnegan, 2003).

B-vitamins are found in a variety of food sources and have been added to energy drinks. Energy drink companies tend to add B-6 and B-12 to their drinks as a claim that it will increase energy. According to Lawson (2007), these vitamins do not actually give the body energy. The B-vitamins are rather keys that help to unlock the users' actual energy storages, such as triglycerides. B-vitamins also play a role in helping to regulate mood by aiding in the formation of neurotransmitters such as gamma amino butyric acid GABA, dopamine, and serotonin. Another less understood vitamin within the B family added to energy drinks is inositol. Nicks (2004) found that patients with clinical depression had low levels of inositol (i.e. B-8). When given to patients suffering from depression and obsessive compulsive disorder, high levels of inositol show promising results.

Ginseng has been used as an herbal drug for centuries. The Chinese first started using this herb as it was believed to prolong life. In Western civilizations, ginseng is

believed to increase energy (Leiberman, 2001). Very few medical studies have supported these long held beliefs, although they have showed that over-ingestion of ginseng may lead to diarrhea, vaginal bleeding, and severe headache (Babu et al., 2008). A study by Engles and Wirth (2001) administered ginseng to 36 subjects split into two groups. Levels of 200 and 400 milligrams of ginseng per day were given to the groups. No significant difference was found between the levels of ginseng on either maximal or sub maximal exercise tests. Despite data suggesting no physical benefit of ginseng, energy drink companies are now including this ingredient in their beverages; however the amount of ginseng included in these beverages is not enough to show any physical or psychological effects (Clauson, Shields, McQueen, Persad. 2008).

Yohimbine hydrochloride (HCL) has recently been included as an ingredient in energy drinks. According to the NIH (2009), yohimbine is used to treat erectile dysfunction. Yohimbine is also available as a prescription for patients suffering sexual side effects from anti-depressants. Evodiamine has also recently been used as an ingredient in energy drinks. Wang et al., (2008) suggests that this poorly understood ingredient is similar to capsaicin but without the hot taste and that this may help patients to avoid diet-induced obesity.

Negative Consequences Associated with Energy Drink Use

Studies show that there are numerous problems associates with energy drink use. Many of these problems come from the over ingestion of caffeine. Newer energy drinks contain higher levels of caffeine than the original Red Bull. For example, energy drinks such as Cocaine (280mg/8.4oz) and SPIKE Shooter (300 mg/8.4oz) contain caffeine

levels roughly 3-4 times higher per ounce than a traditional 8.3 oz Red Bull at 80mg (Woolsey, 2007).

Caffeine intoxication is a clinical syndrome that is recognized by the Diagnostic and Statistical Manual of Mental Disorders as well as the World Health Organization's International Classification of Diseases (Reissig et al., 2009). Common problems with caffeine intoxication include psychomotor agitation, tachycardia, upset gastric track, anxiety, nervousness, insomnia, restlessness, flushing of the face, depression, increased urination, muscle twitching, rambling speech, and tremors (American Psychiatric Association, 1994). Caffeine intoxication and overdose has been known to occur in both habitual and non-regular users of caffeine (Reissig et al., 2009).

Continual use of energy drinks can lead to dependence in some users. In a 1998 study of 162 caffeine users, 30% showed dependence to caffeine (Hughes, Oliveto, Liguori, Carpenter, & Howard, 1998). The dependence on caffeine may lead to withdraw. Juliano and Griffiths (2004) report that caffeine withdraw includes side effects such as headache, tiredness, sleepiness, difficulty concentrating, depression, and muscle aches. The use of energy drinks have also been linked to seizures, stroke, heart problems, and even deaths from excessive stimulant use (as in Malinauskas et al., 2007).

Serious health dangers may be linked to the use of energy drinks. One case study by Worrall, Philipps, & Henderson (2005) reported a 21 year old hiker experiencing cerebral vasculopathy as well as concurrent ischemic and hemorrhagic strokes shortly after ingesting an energy drink. A 2007 study by Iyadurai and Chung reported on four individuals who had discrete seizures following the ingestion of energy drinks. The three males and one female ranged in ages of 19-28 and had no prior health problems other

than an occasional headache. Once the participants stopped drinking energy drinks the seizures ceased as well. Ingestion of Redline energy drink prompted calls to the California Poison Control Center in Sacramento. Walsh, Marquardt, & Alberson (2006) reported that between 2004 and 2006, nine (eight male and one female) persons called in reporting poisoning by this beverage. Symptoms prompting them to call included vomiting, tachycardia, chest pain, tremors, and bilateral numbness. Kapner (2003) reports that because many of the ingredients and herbal compounds in energy drinks are unregulated and not well researched, they may often times be abused by the college population.

Performance Enhancement Studies

Although caffeine has been shown to lead to harmful consequences, a growing body of literature supports the claims of energy drink companies that their products do have health benefits. However, a good deal of this research has been funded by the energy drink companies to support their claims of increased performance, endurance, concentration, reaction time, and enhanced mood (Deixelberger-Fritz et al., 2003; Scholey & Kennedy 2004a; 2004b; Seidl et al., 2000; Warburton et al., 2001; Woolsey, 2007). Researchers have noted a synergistic affect when the individual ingredients within energy drinks are mixed together (Deixelberger-Fritz et al., 2003; Scholey & Kennedy, 2004a, 2004b; Ferreira et al., 2006 as cited in Woolsey, 2007). Results of previous research indicate that the whole energy drink results in significant improvements in “secondary memory” and “speed of attention” (Scholey & Kennedy, 2004a). Additionally, studies that examined the traditional ingredients in Red Bull found improvements in aerobic and anaerobic performance (Alford et al., 2001), sustained

attention and reaction time (Deixelberger-Fritz et al., 2003; Alford et al., 2001; Warburton et al., 2001), improved mood and mental performance (Smit & Rogers, 2002; Deixelberger-Fritz et al., 2003), improved driving performance (Reyner & Horne, 2001; 2002), and alertness (Alford et al., 2001; Warburton et al., 2001; Reyner & Horne, 2001; 2002).

The most consistent result is that caffeine reduces performance decrements under conditions of fatigue or sleep deprivation (Bonnet , Gomez, Wirth, & Arand, 1995). A double blind study (N = 12) by Horne & Reyner (2001) found that when given 500 milliliters of a caffeine containing energy drink (suspected to be Red Bull), sleepy participants in a car simulator significantly decreased reaction time as well as number of adverse incidents. Results suggest that the caffeine containing energy drink may help sleepy drivers react more quickly and have less adverse incidents.

Alford, Cox, & Wescott (2001) performed three studies focusing on physical endurance, psychomotor performance (reaction time, concentration, and memory), and subjective alertness. Study one consisted of 10 subjects (5 male, 5 female), study two consisted of 14 subjects (7 male, 7 female) and study three consisted of 12 subjects (7 male, 5 female). All participants' were college students who were moderate caffeine users. Participants were tested on reaction time prior to receiving any drinks and then given water, a carbonated placebo drink, or an 8 oz. Red Bull drink. Subjects were then tested in reaction time again. Study one found significant differences at the $p < 0.05$ level in choice reaction time between those who drank Red Bull and those who drank water. In the second study significant differences were found in heart rate, choice reaction time, alertness, and aerobic endurance between the carbonated beverage and Red Bull groups.

Study three found significant differences in memory as anaerobic endurance between the carbonated beverage and Red Bull groups.

A 2009 study by Hoffman, Kang, Ratamess, Hoffman, Tranchina & Faigenbaum looked at a new energy drink, Redline, with much more caffeine than the traditional Red Bull. Researchers tested 12 college male athletes in a repeated measures attitudes questionnaire, reaction test, and a Modified Wingate Anaerobic Power Test. From the average of all three repeated measures, significant findings were found for increased energy level, increased focus, and an increase of number and percentage of hits in the reaction test. No significant difference was found in the Modified Wingate Anaerobic Power Test.

Wiklund, Karlsson, Ostrom, & Messner (2009) researched the influence of energy drinks and alcohol on post-exercise heart rate recovery and heart rate variability. Researchers tested 10 subjects (5 men and 5 women) who performed maximal bicycle ergometer test, 30 minutes after the ingestion of either alcohol mixed with energy drinks, energy drinks, or no drink. Results suggest that after the bicycle test heart rate recovery and heart rate variability were significantly slower for when they drank alcohol mixed with energy drinks as well as with energy drinks alone.

A 2009 study by Bruton et al. looked at the effects of caffeinated and uncaffeinated energy drinks on muscular strength and endurance. A sample of 15 college students was tested to assess their maximal voluntary isometric contraction strength after three trials (caffeinated energy drink, uncaffeinated energy drink, placebo drink) using both a pre and a post test. Ingestion of both forms of energy drinks showed a significant increase in

strength in the post test, however there was no difference in the post test between either of the energy drinks.

A study looking at the effect of exercise and energy drinks in sedentary men suggests that consuming energy drinks may help increase fat loss and increase V02 max. Lockwood et al. (2009) assigned 38 males to one of four groups (exercise plus energy drinks, no exercise but drink energy drinks, exercise plus placebo drink, and no exercise plus placebo drink). Participants were tested over a 10 week period. Those in the groups who drank energy drinks were instructed to drink one energy drink per day. Results suggest a significant difference between the group that exercised with an energy drink and the group that exercised with the placebo. Fat mass and percentage body fat were significantly lower and V02 max was significantly higher in the group that exercised and consumed a daily energy drink after the 10 week study.

One study by Arria et al. (2008) suggests that the use of energy drinks may be one factor that may also lead users to use alcohol and other drugs. The study tracked 1060 college students from their freshmen year through graduation on their energy drink, alcohol, and drug use. The results suggest that 24% of the sample consumed energy drinks. Those students that consumed energy drinks reported drinking alcohol more frequently as well as using more illicit drugs in the past year than those who did not drink energy drinks.

Studies looking at the effects of caffeine containing drinks on physical performance have showed mostly positive results. Studies indicate that, relative to placebo, caffeine can increase long-term exercise endurance, and improve speed and/or power output (Graham, 2001; Doherty & Smith, 2004). However, there is debate over whether caffeine has

performance enhancing effects such as mental functioning and an improvement in mood (Childs & De Wit, 2006) or if this is due to the reversal of caffeine withdraw (Reissig et al, 2008).

Energy Drink Advertising

Although new research suggests that there may be psychological and physiological benefits to consuming energy drinks, the advertising claims the manufacturers make have yet to be fully substantiated (Reissig et al., 2008). ‘Red Bull gives you wings’ the popular slogan from the makers of Red Bull is well recognized by energy drink users throughout the United States. Energy drink manufactures play on a ‘jock identity’ of extreme sport athletes (Miller, 2008). These drinks are primarily aimed at young males with names such as Spike, Rockstar, Amp, and Venom. They seem to glorify a high energy stimulant lifestyle (Reissig, 2008). These drinks aimed at young consumers are advertised for a variety of reasons, to reduce tiredness, to help study, increase focus, and most predominantly to help improve performance (Malinauskas, 2007).

Miller (2008) sampled 795 undergraduate students looking at ‘toxic jock identity’ which is defined as a sport-related identity predicated on risk taking and hyper-masculinity. The strength of this toxic jock identity was positively associated with the frequency of energy drink consumption (Miller, 2008). The advertising schemes of energy drink companies blatantly play into this identity.

Alcohol Combined With Energy Drink Use

The new trend of combining alcohol and energy drinks is prevalent in the college population. College students have begun combining these two ingredients into drinks that

are now popularly marketed at many college bars. Red Bull Vodka, Jager Bombs, Monster Bombs, and Vegas Bombs are popular mixed drinks containing alcohol and energy drinks that are heavily sold to college students (Simon & Mosher, 2007). In a study by Malinauskas et al. (2007), 496 college students from the central east coast were sampled on their use of energy drinks and alcohol. Of the total sample, 49% reported combining alcohol and energy drinks, with energy drink users combining 54% of the time. Another large study by O'Brien et al., looked at college students from 10 different universities in North Carolina. From this sample, 24% of students reported combining alcohol and energy drinks within in the past 30 days. The majority of these students were white females who played intramural athletics and/or were members of fraternities or sororities (O'Brien et al., 2008).

The trend of combining alcohol and energy drinks is not only found on the east coast. Woolsey (2007) sampled 401 college athletes at a major Division I university in the Midwest. Results indicated that 48% of these college athletes combined alcohol and energy drinks. Woolsey, Kensinger, and Jacobson (2009) surveyed 362 students throughout four campuses including the main campus of a major Midwest Division I university. The researchers found that 44% of this sample combined alcohol and energy drinks. Medical students at an Italian university were surveyed on their use of alcohol combined with energy drinks by Oteri et al. (2007). Of the approximate 2000 students at the university, 500 were surveyed. Of these 500 students, 218 or 48% of the total sample reported combining alcohol and energy drinks.

Effects Associated With Combined Use

Until recently, little scientific research has looked at the effects of the combination of alcohol and energy drinks. The first studies were conducted on mice and in recent years researchers have investigated the effects on humans. Ferreira et al. (2004) were the first to study the effects of the combination of alcohol and energy drinks. These researchers investigated whether energy drinks reduced the depressor effects of ethanol in male mice from a single colony. Mice were given either 100ml of Red Bull mixed with ethanol or a placebo drink mixed with alcohol. Results suggested significant differences in locomotor activity with the energy drink group having a much higher locomotor activity as compared to the control group. Further, the caffeine in these energy drinks may stimulate the A2a adenosine receptors which may help reduce the hypnotic effects of alcohol (El Yacoubi, Lednet, Parmentier, Costenin, & Vaufeois, 2003; Ferreira et al., 2004).

The first research on the effects of the combination of alcohol and energy drinks in humans was conducted by Ferreira et al., (2004a). Researchers tested 14 healthy male volunteers with an average age of 24 years. Subjects were tested under four conditions: 1) ingestion of water 2) ingestion of alcohol 3) ingestion of energy drinks 4) ingestion of alcohol combined with Red Bull. Subjects completed a Vo₂ maximal exertion test. No significant differences were found in the maximal oxygen consumption (Vo₂ max) in any condition. These results suggest that the combination of alcohol and energy drinks does not have a significant effect on maximum oxygen uptake as compared to the other three groups.

A study by Ferreira et al. (2006) focused on the effects of energy drink ingestion on alcohol intoxication. Twenty-six young subjects were randomly assigned to two groups. Group one received 0.6 g/kg of alcohol and group two received 1.0 g/kg of alcohol. Each group was tested under three conditions: 1) alcohol only 2) energy drink only 3) alcohol mixed with energy drinks. Compared with alcohol alone, researchers found significant differences in subjects' perceptions when they combined alcohol and energy drinks. When subjects ingested alcohol combined with energy drinks they reported less headaches, weakness, dry mouth, and impairment of motor coordination. However, in physiological testing, the combination of alcohol mixed with energy drinks did not significantly reduce alcohol's effects on motor coordination or visual reaction time, nor did it reduce blood alcohol concentration. Although subjects felt better and more coordinated, they actually were not.

Users of alcohol combined with energy drinks may feel less intoxicated, but researchers suggest that they are actually not. Additionally, those who drink this combination appear to drink more alcohol as well. In a sample of 500 students, those who used both energy-drinks-only (i.e., without alcohol) and drank the combination of alcohol and energy drinks were found to drink a higher number of cocktails on a daily and weekly basis (Oteri et al., 2007). This may be problematic as research shows combining alcohol and energy drinks leads to more negative consequences (O'Brien et al., 2008).

In a sample of 401 athletes from a major Division I university, Results indicated that 48% of college athlete drinkers ($n = 315$) combined alcohol with energy drinks (EDs) in the past year and 92% of drinkers participated in binge drinking episodes. From a total

of 401 student-athletes, 150 (37%) combined alcohol with energy drinks and 194 (48%) used energy drinks without alcohol. In this study, Woolsey (2007) found that in comparison to the use of alcohol-only the consumption of alcohol combined with energy drinks significantly increased risk taking behaviors and negative consequences among Division I college athletes on the risk taking and consequence. In this study, combined-users ($n = 150$) drank more than double the amount of alcohol than athletes who consumed alcohol-only ($n = 165$) and did not combine (Woolsey & Kensinger, unpublished manuscript).

Six-hundred-ninety-seven students in O'Brien et al. (2008) study consumed alcohol combined with energy drinks. This was 24% of the entire sample. Numerous negative consequences were found to be significantly higher in this group compared to those who only consumed alcohol. Students who combined started drinking at a younger age than those who did not combine (15.1 years vs. 16.0 years; $p < 0.001$). These students also reported consuming alcohol on more days per week than those who did not combine (1.7 days vs. 1.2 days; $p < 0.001$). Drinking behaviors in those who combined were significantly higher at the $p < 0.001$ level than those who did not in four areas: 1) typical number of drinks in a single episode (5.8 vs. 4.5) 2) Number of binge drinking days in the past 30 days (6.4 vs. 3.4) 3) Number of days drunk in a typical week (1.4 vs. 0.73) 4) most number of drinks in a single episode within the past 30 days (8.3 vs. 6.1). The higher negative drinking behaviors also resulted in five significantly higher consequences at $p < .01$ level: 1) was taken advantage of sexually 2) took advantage of another sexually 3) rode with a driver who was under the influence of alcohol 4) was hurt or injured 5) required medical treatment. Although those who combined alcohol with energy drinks

had higher negative drinking behaviors as well as negative consequences, they reported that the subjective signs of intoxication were less when they combined alcohol with energy drinks. This suggests that although those who combine alcohol and energy drinks may not feel the physical symptoms of impairment they are still impaired and the addition of energy drinks only masks the effects of the alcohol (Reissig et al., 2008).

The masking effects of energy drinks on intoxication are seen after very few energy drinks. In a sample of 362 students, Woolsey, Kensinger, & Jacobson (2009) found that the masking effects as well as euphoric effects of energy drinks begins after consuming only 1.79 energy drinks. Throughout the world countries are now requiring energy drink manufacturers to label their products with a warning to not combine alcohol with energy drinks. Countries such as France, Finland, Ireland, Sweden, and Australia have all issued statements about the dangers of consuming alcohol combined with energy drinks. So far no statement has been issued or warning label added to energy drinks in the United States (O'Brien et al., 2008).

Drinking Motivations

Despite negative consequences associated with drinking and increased prevention efforts, the level of binge drinking on college campuses has not significantly decreased (Weschler et al., 2002). There are multiple factors as to why students choose to engage in risky drinking behaviors; however, a common pathway related to the choice to engage in drinking is mediated by known or unknown motivations. These motivations are closely associated to perceived incentives in other areas of their life and to the affective changes people derive from these incentives (Cox & Klinger, 1988). The Motivational Model of Drinking developed by Cox and Klinger (1988) suggests that drinking motives are the

strongest factor for people choosing to engage in drinking. This is based on an expected reward system with four factors: positive reinforcement (positive outcomes), negative reinforcement (negative outcomes), internal (personal changes), and external (social environment changes). Thus, theoretically this model has similarities to health behavior models such as the Health Belief Model and the Social-ecological Model, but was created specifically to predict drinking motives (Shumaker, Ockene, & Riekert, 2008). These factors combine with one another to influence an individual's motivations to use or abstain (Kuntsche & Steward, 2009). These motives can be measured to predict the extent a person's values affect a person's drinking behaviors (Cooper, 1994). It has been documented that people drink alcoholic beverages for different reasons and are motivated to experience different drinking outcomes (Jensen et al., 2002; Klein & Pitman, 1990).

Cooper, Frone, Russel, & Mudar (1995) tested the Cox and Klinger (1988) Motivational Model of Drinking to identify the variance across gender and race. A sample of 2,544 adolescence and 1,933 adults were used in this study. Results suggest that on both gender and race, the hypothesized model was an excellent fit. In both samples (adolescent and adult) variance constraints were largely supported with very few relationships differing in strength in both race and gender in the adult group. Findings of this study suggest that the motivational process to engage in drinking behavior is similar across gender, race, and age.

The Drinking Motives Questionnaire-Revised (DMQR) is one of most popular drinking motive measures. This instrument measures reasons as to why students engage in drinking behavior. The DMQR is a self-report instrument comprised of 20 questions that focus on four scales (social, coping, enhancement, and conformity) with five items in

each scale measuring drinking motives. Mohr et al. (2005) used the DMQR in a study on 200 undergraduate psychology students to examine drinking motives. Students were asked to log on to a website, daily, for 21 days and report their mood, social contacts, as well as health behaviors which included drinking alcohol. Results of the study indicate that students drank an average of 3.85 days per week while drinking an average of 5.91 drinks on each of these occasions. The drinking levels varied by day of the week, $F(6,2074) = 53.44, p < 0.01$, with the highest consumption levels on Saturday ($M= 3.80, SD= 4.65$) and the lowest levels on Monday ($M= 0.46, SD= 2.30$). Mohr and colleagues found that these levels of drinking were positively associated with drinking motivation endorsements, for both men and women. Conformity motives were positively associated with a higher average negative mood. Coping motives were also positively correlated with a lower than average positive mood and higher than average negative mood. Overall, drinking for social motives was found to be four times higher for positive contacts than negative contacts. The positive social contact moods were positively associated with drinking away from home and within a social context while negative moods were positively associated with drinking at home without social interaction. Further results of this study suggest that weekday drinking is associated with tension reduction as well as greater negative consequences while weekend drinking is primarily associated with enhancement motives and is social in nature.

Adolescents appear to conform to the drinking motives of their peers. A 2009 study by Kuntsche & Stewart examined to what degree the social, enhancement, coping, and conformity motives of individuals are associated with those of their classmates as well as what degree of individual alcohol use is related to their classmates. In their

sample of 5,649 students showed a high congruency between individuals and other individuals in their class across the dimensions of drinking motives. Within alcohol use, social and enhancement motives were positively associated with drinking volume, while enhancement and coping motives were associated with higher levels of drinking (5+ drinks). These results suggest that in adolescence, individual drinking motives are closely shaped by their social environment. These adolescents may select peers who share the same drinking motivations as they do (Kuntsche & Stewart, 2009).

Kuntsche, Stewart, and Cooper (2008) examined the similarities and differences between adolescent drinking motivations from students in Switzerland, Canada, and the United States. After restriction of age (14-17 years) and removal of non-drinkers a total sample of 8,282 students was used (Switzerland $n=5,118$; Canada $n=2,557$; United States $n=607$). The DMQR was used to examine drinking motivations. Across the four factors, the three countries scored very similar with similar item loadings on each factor and similar item correlations. A positive association between conformity motives and alcohol related problems was found in both the Canadian and United States sample. This suggests that adolescents in these two countries have more problems with peer pressure in regards to alcohol use as well that their drinking is to conform to is related to school and social alcohol problems.

Heredity may be a significant factor in drinking motives. In a study of 3,788 young female twins with a mean age of 22 years, Agrawal et al. (2007) assessed similarities and differences in heredity and drinking motives. Researchers used the Drinking Motives Questionnaire Revised to uncover how heredity plays into drinking motives. Results in this sample suggest that heritable shared environmental influences

were found to be significant in three factors, social, coping, and conformity. Genetic factors contributed to the total variance of social (11%), coping (18%) and conformity motives (22%). This study suggests that the quantity and frequency of alcohol consumed and drinking to intoxication were significantly correlated ($p < 0.05$) with all motives except for conformity.

Bailly, Carman, & Forslund (2001) sampled 420 college drinkers on their drinking motivations using the Drinking Motivation Scale created by Bailly (1987). One of the original drinking motives scales, this instrument contains 40 items broken down into 4 categories of 10 questions each (Positive Social, Personal Social, Dominance Power, and Assertiveness Power). Researchers were interested in exploring gender differences in drinking motivations. Significant differences were found ($p < 0.01$) between genders in Positive Social (Males, $M=9.26$; Females, $M=8.88$) and for a total score (Males $M=25.16$, Females $M=22.84$). The dominance power category was significantly different ($p < 0.001$) with males having a higher score than females, 4.36 to 3.40 respectively. This research suggests that there are differences in the drinking motivations for males and females. Males tend to drink for 'dominance power' while women seem to consume alcohol for needs for assertiveness and self-expression.

A study by Carman and Holmgren (2001) examined gender differences in drinking motivations and drinking correlations. The sample of 393 students suggested that there were significant gender differences in regards to the relationship of drinking outcomes and drinking motivations. For males, no significant correlation was found involving drunkenness ($r = 0.05$) or involving social complications ($r = 0.10$) in regards to the percentage of personal psychological drinking motivations. In females however,

both drunkenness and social complications ($r = 0.41$; $r = 0.37$ respectively) were found to be significant at the $p < 0.001$ level.

Perceived Positive Alcohol Expectancies

Numerous studies have examined the role that alcohol expectancies have in drinking behavior. These expectancies are the beliefs that one holds about what will happen if they consume alcohol (Read, Lau-Barraco, Dunn, & Borsari, 2009). Twenty years of research suggest that beliefs about what will happen when consuming alcohol (expectancies) are reliably associated with drinking behavior (Fromme & D'Amico, 2000). The more positive alcohol expectancies that one has, the more likely it is that they will engage in drinking behavior. Positive alcohol expectancies are associated with heavy drinking, more frequent alcohol use, and associated alcohol related problems (Palfai & Wood, 2001). Read et al., (2009) surveyed 334 college aged students on both their positive and negative expectancies of alcohol use. Results of this study suggest that at higher levels of drinking, (4+ drinks for women, 6+ drinks for men) drinkers perceive more positive expectancies and are more excited while drinking.

Lee, Greely, and Oei (1999) also looked at the effect of the quantity of alcohol consumed on expectancies. This study consisted of one-hundred-eighty-seven drinkers from the general community. Subjects were grouped into high risk ($M=47.3$ drinks/week, $n=20$) and low risk ($M=4.3$ drinks/week, $n=167$) categories. Subjects were surveyed using the Drinking Expectancy Questionnaire, the Khavari Alcohol Test, and the Short-form Alcohol Dependency Data Questionnaire. Results suggest that those individuals who drink heavier amounts on an infrequent basis (high quantity, low frequency) had higher expectations for increased assertiveness and cognitive enhancement. When

subjects consumed drinking less alcohol per drinking episode, they reported more negative expectancies.

Palfai and Wood (2001) used a sample of 314 college drinkers from the Northeast United States. Participants reported consuming alcohol an average of 1.62 times per week with a mean of 5.44 drinks per occasion. Over the past year, students reported binge drinking an average of 19.65 occasions and typically drinking 10.04 drinks per binge episode. Examination of the interaction effect between alcohol frequency and quantity with expectancies was measured. Results suggest that the interaction between the frequency of alcohol use and expectations was stronger for those who associated positive outcomes with alcohol consumption.

Perceived Positive Reinforcements

Unlike drinking expectancies, perceived positive reinforcements are actual outcomes one experiences from drinking alcohol rather than what one believes will happen. Perceived positive reinforcements were previously termed 'positive consequences' by Park (2004). This term suggests that users can receive or derive positive outcomes from drinking large amounts of alcohol. For the purpose of this study, the researcher examined perceived positive reinforcements from a health and psychological standpoint. In other words, even though alcohol users can and do perceive heavy alcohol use as a positive, alcohol use in this manner does cause damage to the body and is an unhealthy behavior. Positive beliefs about the effects of alcohol are typically found to be less related to negative consequences and more related to perceived positive reinforcements. Perceived positive reinforcements are also a good predictor of one's likelihood of becoming psychologically and even physically dependent on alcohol.

When a person believes that they need alcohol to enhance who they are (e.g., to be more social) or give them positive outcomes (e.g., better chance with opposite sex) they are more likely to become psychologically and physically dependent. According to addiction experts, this type of thinking typifies the thinking patterns of those who are psychologically addicted to substances (Miller & Carroll, 2006). Very little research has been conducted on college students (Park & Grant, 2005). Currently, only two studies have examined perceived positive reinforcements. The original study focusing on perceived positive reinforcements was conducted by Park (2004). Her study of 263 undergraduates (104 men & 159 women) looked at the relationship of alcohol consumption to positive and negative consequences. Overall, students reported more positive than negative experiences with drinking [$M = 2.70$ vs. 1.81 , $t(241) = 18.02$, $p < 0.001$]. The frequency of experiencing these positive and negative consequences were significantly correlated ($r = 0.47$). Further, men reported experiencing both more positive and negative experiences than women [Positive: $M = 2.83$ vs. 2.50 , $t(239) = 2.29$, $p < 0.001$; Negative: $M = 1.97$ vs. 1.69 , $t(239) = 3.39$, $p < 0.001$]. On future drinking intentions, both men and women reported that they were more strongly influenced by their most positive drinking experience than their most negative experience. There was no difference between men and women to what extent their most positive experience would dictate their future drinking intentions, but women did cite that their most negative experience would be more influential to them than men in their future drinking behaviors.

A follow up study by Park and Grant (2005) used 160 of 181 volunteers as 21 reported that they did not drink alcohol. Results suggest that both men and women significantly reported experiencing more perceived positive reinforcements than negative

consequences. Overall, men reported experiencing more negative consequences, but not more perceived positive reinforcements than women. The most predominately cited negative consequences were having a hangover and missing class. The most cited perceived positive reinforcements were feeling relaxed and forgetting school problems.

Prevention and Intervention Techniques

Research indicates that health educators should not only focus on the negative consequences associated with alcohol and energy drink use but also the perceived positive reinforcements (Shumaker et al., 2009; Park & Grant, 2004). Understanding students' motivations for using alcohol has become increasingly important in the role of developing prevention and intervention strategies (Jones, Corbin, & Fromme, 2001). In the field of counseling psychology, numerous studies indicate that positive reinforcers are more predictive for effective health behavior change (The use of Self-Determination-Theory has had successful results in a variety of health interventions (Ryan, Patrick, Deci, & Williams, 2008). Self-Determination-Theory is based on change in intrinsic motivations in which the person is actively involved in the decision making process. Health behavior change research indicates that change is more effective and longer lasting when people choose to change for positive reasons versus avoiding negative outcomes (Fortier, Sweet, O'Sullivan, & Williams, 2007; Shumaker et al., 2009).

An experimental study of 120 individuals involving a treatment group (received Self-Determination-Theory training) and a control group (no Self-Determination-Theory training) was conducted by Fortier et al., (2007). Researchers looked for increases in physical activity level based between groups. No significant differences were found between groups at the baseline, however, autonomous motivation, perceived confidence,

were significantly greater at six weeks for the treatment group and physical activity level was significantly increased at week 13. Results suggest that the use of Self-Determination-Theory may be beneficial in increasing physical activity.

Munster-Halvari and Halvari (2006) conducted an experimental test focusing on the use of Self-Determination-Theory and dental hygiene. Experimental and control groups were split evenly among 86 participants. Each group received dental hygiene cleanings with the experimental group also receiving Self-Determination-Theory based training. Surveys were distributed to each group on a variety of health topics. Baseline scores for each group were similar with no significant differences. After the seven month trial, the experimental group significantly differed in perceived competence, autonomous motivation, health behavior, health attitudes, plaque levels, and gingivitis levels.

Williams et al., (2006) investigated the effects of a Self-Determination-Theory based treatment on tobacco cessation. The 1006 participants in the study were divided into either a control group which received only community care or a experimental group which received intensive treatment including Self-Determination-Theory based autonomous support and autonomous & competence motivation. Results from this study suggest that the use of Self-Determination-Theory based treatment significantly resulted in an increased use of cessation medications as well as a six-month prolonged absence from the use of tobacco.

As a brief alcohol intervention, Motivational Interviewing, is known as the most effective health behavior change technique available to those who have not undergone extensive counseling training (Burke, Arkowitz, & Menchola, 2003; Shumaker, Ockene, & Riekert, 2009). Motivational Interviewing is based on four skills: 1) expressing

empathy 2) developing discrepancy 3) rolling with resistance 4) supporting self-efficacy (Miller & Rollnick, 2002; Shumaker, Ockene, & Riekert, 2009).

Motivational Interviewing follows four guiding principles. First is to resist the rightening reflex. This means that the practitioner does not say stop or don't do that, they let the client come to that decision on their own. Second is to understand and explore the clients own motivations, Finding what truly motivates the client is necessary and the practitioner strives to be concerned with the patient's own values, concerns and motivations. The third principal is to listen with empathy. The practitioner should do as much listening to the client as giving advice. The fourth principal is to empower the client with hope and optimism. Supporting and helping to create a behavior change plan is key. Throughout these principals the practitioner listens for certain types of change talk. These include the patient eliciting a desire to change, showing ability to change, citing reasons to change, and a need to change (Rollnick, Miller, & Butler, 2008).

The practitioners goal in Motivational Interviewing is to apply these principals and not explicitly advocate for change, but rather let the client present the ideas of change themselves. If the client resists change, which is expected, the counselors' goal is then to roll with this resistance and continue to actively listen to the client. Once the idea of change is present, the counselor guides the clients to help them focus on why and how they can change. This helps to increase their self-efficacy and confidence in their ability to successfully change (Burke, Arkowitz, & Menchola, 2003). If a total behavior change is not feasible, the goal then becomes reducing or changing the clients way of thinking about the behavior (Rollnick, Miller & Buttler, 2008). Motivational Interviewing focuses on helping clients understand their own thoughts about their behavior and helps

students move away from resistance and ambivalence about changing in the pre-contemplative and contemplative stages to a readiness for change. The client cites personal motivations for using the substance along with perceived positive reinforcements which they derive from alcohol use. By understanding students motivations for drinking, counselors and health practitioners can help clients learn natural methods and techniques to achieve the desired outcome of using the substances (Dimeff, Baei, Kivlahan, & Marlatt, 1999). Motivational Interviewing may be particularly beneficial in prevention programs with adolescents, due to their resistance and adverse actions towards adults trying to control their behavior (Masterman & Kelly, 2003). Numerous studies have been conducted validating the efficacy of Motivational Interviewing as a successful brief intervention.

A 2006 study conducted by Carroll et al. focused on 423 substance abusers entering an outpatient treatment program. Participants were divided into two groups during their intake session. Group one received the basic intake evaluation only while group two received the basic intake evaluation as well as motivational interviewing techniques. At the 28 day follow up interview those participants who received the basic intake evaluation plus Motivational Interviewing techniques showed significantly better retention of the information than those who received only the basic intake evaluation. There was no significant difference however in either the 28 or 84 day follow up regarding substance use. This suggests that incorporating Motivational Interviewing into the early parts of treatment programs may help with retention during the early course of treatment.

Stein et al. (2006) examined 130 incarcerated adolescents and the effect of Motivational Interviewing on substance treatment. Participants were divided into two groups, group one received motivational interviewing techniques throughout their treatment while the second group did not. Following the treatment program the group that received Motivational Interviewing techniques showed that Motivational Interviewing significantly alleviated substance abuse treatment engagement.

Motivational Interviewing has been shown to be a successful technique in college based alcohol education treatment programs. A 2005 study by Borsari and Cary examined the effects of brief Motivational Interviewing techniques in 64 college students in a mandated substance use prevention program. Of the participants, 34 received the brief Motivational Interviewing techniques in their treatment program while remaining 30 participants did not. Results showed that at both three and six month follow ups, both groups had decreased their alcohol use. Further, a significant reduction in negative alcohol related problems was seen at three and six months in the Motivational Interviewing group only.

Because Motivational Interviewing has shown promising results, alcohol intervention programs have begun to incorporate it into the curriculum. One such program is the Brief Alcohol Screening and Intervention for College Students (BASICS). This program focuses on achieving specific goals in the reduction of drinking. Students make the change along a continuum and choose the path that best suits them. Practitioners in this program help students develop coping skills and assess peer norms. This in turn helps students to make a choice for themselves about their drinking behavior and solidify a clear plan on how to achieve it (Dimeff, Baer, Kivlahan, & Marlatt, 1999).

Summary

There are many negative consequences due to the abuse and misuse of alcohol on college campuses. Students are now combining alcohol with energy drinks which increases negative consequences. Students are not informed of how the interaction of these two substances will affect them, nor are they knowledgeable on the ingredients within energy drinks.

Two factors that play a role in the decision to combine alcohol and energy drinks are drinking motives and perceived positive consequences. Researchers must be aware of these factors to better design health education programs that are targeted to this group.

CHAPTER III

METHODOLOGY

Participants

During the fall semester of 2009, a convenience sample of 18-26 year old college students was used in this multi-campus study. Participants came from two different institutions, Oklahoma State University and Northern Oklahoma College. The sample was collected from wide variety of academic courses throughout the universities. The researcher contacted professors and teaching assistants for help with subject recruitment and provided a script to read to their students. The professors and teaching assistants informed their students of this research opportunity as well as many professors sent a follow up reminder e-mail each week until the study was complete. If students chose to participate they had an opportunity to enter in a lottery drawing for two \$50 cash prize incentives. Approval was obtained from the Institutional Review Board [IRB] prior to the beginning of this voluntary study; see Appendix E on page 121.

Instruments

Demographic Questions

Demographic analyses were used to measure differences in: age, sex, ethnicity, year in school and extracurricular activities. The quantity-frequency of energy drink and alcohol use was measured by the Quantity-frequency index. This index is based off of the

European School Survey Project on Alcohol and Drugs, and has been used as a measure by many prominent alcohol researchers. Factors that previous research has identified that could potentially influence students to combine alcohol and energy drinks were also examined, such as availability of alcohol and energy drinks, greek life, and athletics. For complete instrument see Appendix A on page 97 and Appendix B on page 108.

Drinking Motives Questionnaire-Revised (DMQR)

The Drinking Motives Questionnaire-Revised (DMQR) (Cooper, 1994) has been used to assess individuals drinking motives. Drinking motives play into the final decision one makes when choosing whether or not to engage in drinking behavior. Motivations for drinking are an important consideration when looking at risky drinking behaviors and patterns. These motivations are the regarded as the final decision that one must before choosing to engage in drinking behavior. The DMQR asks participants to report how frequently their drinking is motivated by social, coping, enhancement, and conformity factors.

The DMQR is one of the most popular and widely used scales for measuring drinking motivations. There are two underlying dimensions within this scale. The first reflects valance, which is positive or negative motivation and the second reflects source, which is internal or external motivation (Kuntsche et al., 2006). The DMQR scale was based on a previous drinking motives conceptual model by Cox and Kinger (1988), which was developed for 13-19 year olds in North America. Martins, Rocha, Martin, and Serrao (2008), further validated this instrument in a study of 441 college undergraduates and found the DMQR scale to be reliable among college students with internal coefficient α levels of 0.82 – 0.88 dependent upon subscale.

The DMQR is a self-report instrument comprised of 20 questions that focus on four scales (social, coping, enhancement, and conformity) with five items in each scale measuring drinking motives. Sample items (reasons) include: to forget your worries, because your friends pressure you to drink, to cheer up when you are in a bad mood, because it improves parties and celebrations, and, because you feel more self-confident and sure of yourself.

The DMQR is scored on a five point Likert scale with intervals of 1) Never/almost never 2) Some of the time 3) Half of the time 4) Most of the time 5) Almost always/always. Overall scores can range from 20 to 100 as well as between 5 to 25 per subscale. No items are reverse scored and higher scores suggest a higher motivation to drink.

All factors within the DMQR have a high internal consistency and have been shown to be psychometrically sound (Grant, Stewart, O'Connor, Blackwell, & Conrod, 2007). The four factors are as follows: 1) Social – The social scale includes five items (3, 5, 11, 14, 16) and was validated with an internal consistency of coefficient $\alpha = .82$. These items reflect social motives for using alcohol such as to enjoy a party, to be more sociable, and it makes gatherings more fun. 2) Coping – The coping scale includes five items (1, 4, 6, 15, 17) and was validated at an internal consistency of coefficient $\alpha = .88$. These items reflect coping motives for using alcohol (e.g., forget your worries, it helps you when you feel nervous, and to cheer you up). 3) Enhancement – The Enhancement scale includes five items (7, 9, 10, 13, 18) and was validated at an internal consistency of coefficient $\alpha = .85$. These reflect enhancement motives for using alcohol such as because you like the feeling, because it is exciting, and to get high. 4) Conformity– The conformity scale

includes five items (2, 8, 12, 19, 20) and was validated at an internal consistency of coefficient $\alpha = .86$. These reflect external social pressures that lead an individual to conform and use alcohol such as peer pressure to drink, so you do not get harassed about not drinking, and to fit in. For the complete instrument see Appendix C on page 113.

Positive Drinking Consequences Questionnaire (PDCQ)

Drinking alcohol produces numerous negative consequences and most researchers have focused their investigations on these negative consequences. However, a new line of research focusing on the perceived positive reinforcements of alcohol use is beginning to emerge. Researchers suggest that perceived positive reinforcements are important in assessing drinking behavior (Corbin et al., 2008; Park, 2004; Park & Grant, 2005). Currently, the PDCQ is the only validated instrument to specifically measure perceived positive.

The PDCQ was developed by Corbin, Moraen, and Benedict and tested in a 2005 sample of 423 undergraduate students (2008). This instrument was based on previous measures of alcohol expectancies including the Alcohol Expectancy Questionnaire (Brown, Christiansen, & Goldman, 1987), Effects of Alcohol Questionnaire (Rohsenow, 1983), Comprehensive Effects of Alcohol (Fromme, Stroot, & Kaplin, 1993), and the Brief Comprehensive Effects of Alcohol (Ham, Stewart, Norton, & Hope, 2005). The PDCQ is different from the previous measures because questions were adapted and written to better reflect event-specific consequences of drinking. Thus, the PDCQ uses actual past perceived positive reinforcements that have happened rather than focusing on participants beliefs of what would happen when consuming alcohol (Corbin et al., 2008).

Authors of the PCDQ instrument noted that during scale development, participants reported perceived positive reinforcements twice as much as negative consequences (Corbin et al., 2008). Perhaps perceived positive reinforcements play a large role in drinking behavior and motivations.

The PDCQ is comprised of 14 questions with a high internal reliability coefficient of $\alpha = .88$ and the reliability coefficient was also calculated at $\alpha = .88$ when separated by sex. The instrument asks participants to indicate the number of times they have experienced the following consequences in the last three months, stressing that they only report what actually occurred, not what they had thought to occur. Sample items from the instrument include: I told a funny joke and made others laugh, the intensity of a sexual experience was enhanced, I stood up for a friend or confronted someone who was in the wrong, and, I felt especially confident that other people found me attractive.

The original measure was scored in a five point interval scale based on the number of times subjects had experienced the consequence (1, 1-2, 3-5, 6-10, >10). These classifications of responses may be problematic for the purposes of this investigation. For example, based on the number of drinking occasions in the past three months, the participants may be forced into one of these categories (i.e., if they only drank twice, they would be forced to answer within the first two categories).

For the purpose of the current investigation, the response categories were modified to reflect more practical and perhaps more accurate responses. The five point categorical interval scale was kept: however, the classifications were changed to 1) Almost never/never 2) Some of the time 3) Half of the time 4) Most of the time 5) Almost always/always. Furthermore, these response classifications are consistent with the

DMQR which makes the entire survey more consistent and user friendly. The possible range of scores within this instrument goes from a low score of 14 to a high score of 70. Higher scores represent more positive consequences due to drinking. For the complete instrument see Appendix D on page 117.

Data Collection Procedures

The principal investigator asked professors and teaching assistants to help recruit volunteers. Volunteers who wished to participate in this study were directed by their professors and teaching assistants to a webpage link where they anonymously completed an online survey after agreeing to the participant rights and informed consent page. This survey was constructed using Microsoft 2007 FrontPage software. This program allowed the investigator to build a unique survey. The survey was hosted by the Oklahoma State College of Education.

The survey consisted of four sections (See Appendix A, B, C, D). First, participants were asked to complete a quantity/frequency questionnaire. Second, participants were asked to complete the DMQR instrument, which examined student motives for engaging in drinking behaviors. Third, students completed the PDCQ, which asks questions about positive drinking outcomes. Fourth, demographic questions were asked as to help better define various groups. All of these instruments were originally created to measure alcohol use only. Therefore, slight modifications were made to these instruments to appropriately measure both alcohol and the combined use of alcohol and energy drinks.

Once participants completed the survey, they clicked the 'submit' button on the webpage. This sent their data from the survey page to an Excel data file where all data

was collected and stored. All storage and management of data was handled by a trained professional on a secure web server. At the completion of the research project, the primary investigator gathered data from the Excel file and transferred it to a Statistical Package for Social Sciences [SPSS] data file to be analyzed.

Data Analysis

Descriptive statistics were used to analyze the quantity-frequency information of this study. SPSS version 16.0 was used to analyze all data in this study. The investigator set the alpha level at $p \leq 0.05$ for both t and F ratios to test for the statistical significance. Independent samples t -tests were used to measure differences in drinking motives and positive consequences between alcohol-only users and combined-users. Paired samples t -tests were used to measure differences in drinking motives and positive consequences within the combined-user group. Pearson product-moment correlations were used to determine the relationship between the amount of alcohol consumed and positive consequences among combined-users.

Ho1: There will be no significant differences in reported Drinking Motives scores between students who consume alcohol-only and those who combine alcohol and energy drinks. Hypothesis one was analyzed with an independent samples t -test.

Ho2: There will be no significant differences in reported Perceived Positive Reinforcement scores between students who consume alcohol-only and those who combine alcohol and energy drinks. Hypothesis two was analyzed with an independent samples t -test.

Ho3: Within combined users there will be no significant difference in reported Drinking Motives scores when they consume alcohol only compared to when they combine

alcohol and energy drinks. Hypothesis three was analyzed with a paired samples *t*-test.

Ho4: Within combined-users there will be no significant difference in reported Perceived Positive Reinforcement scores when they consume alcohol-only compared to when they combine alcohol and energy drinks. Hypothesis four was completed using a paired samples *t*-test.

Ho5: There will be no significant difference between males and females in reported Drinking Motives score within combined-users. Analysis of hypothesis five was completed using an independent samples *t*-test.

Ho6: There will be no significant difference between male and females in reported Perceived Positive Reinforcement scores within combined-users. Analysis of hypothesis six was completed using an independent samples *t*-test.

Ho7: There is no relationship of the average amount of alcoholic drinks consumed on one occasion and Perceived Positive Reinforcement scores in combined-users when they use alcohol-only. Analysis of hypothesis seven was completed using a Pearson product-moment correlation.

Ho8: There is no relationship of the average amount of alcohol consumed on one occasion and Perceived Positive Reinforcement scores in combined-users when they combine alcohol and energy drinks. Analysis of hypothesis eight was completed using a Pearson product-moment correlation.

CHAPTER IV

RESULTS AND DISCUSSION

The purpose of this study was to investigate differences in drinking motives and perceived positive reinforcements among college student populations comparing when they drink alcohol-only to when they combine alcohol and energy drinks. Data was collected from a convenience sample of students at a large Division-I Midwestern University during the fall semester of 2009 via online administration. This chapter reports on the data collected and analyzed for this study and then discusses the results for each hypothesis, followed by a brief summary of the findings.

Descriptive Data Results

A total of 540 students completed the online survey. This number was then reduced according to the age restriction (18-24 years old) set forth by the researcher and then further reduced to only those students who drank alcohol. The final number of participants for data analysis in this sample was 371. Although the participants filled out the majority of the survey, in some cases they did not supply an answer for a variable. In these instances, cases (participants) were excluded pairwise. That is, they were excluded for the analysis only if the data was missing for the specific analysis. The cases were still included in all other analysis for which they met the criteria.

In the sample of 371 drinkers between the ages of 18 and 24, 129 were male and 237 were female (34.8% male and 63.9% female). This was not representative of the university population. Descriptive statistics for the participants are presented in Table 1. The mean age for the population was 20.14 (\pm 1.59) years old. For males the mean age was 20.82 (\pm 1.70) and for females was 20.10 (\pm 1.53) years old.

Table 1
Descriptive Statistics for Age and Sex

	N	Age (y \pm SD)
Males	129	20.82 \pm 1.70
Females	237	20.10 \pm 1.53
Group	366	20.14 \pm 1.59

The frequency distribution of the age of all subjects showed that 20.5% of participants were 18, 15.9% of participants were 19, 19.1% of participants were 20, 21.8% of participants were 21, 12.9% of participants were 22, 4.9% of participants were 23, and 2.2% of participants were 24. As demonstrated in Table 2, the participants' ages ranged from 18-24.

Table 2
Age Frequency of all Subjects

Age	Number	Percent
18	76	20.5
19	59	15.9
20	71	19.1
21	81	21.8
22	48	12.9
23	18	4.9
24	8	2.2

Analysis of the data showed that college seniors represented the largest amount of participants with 28.6 % of the population, followed by freshmen at 26.4%, with 22.1% classified as sophomores and 20.8% classified as juniors. A small number, 1.9%, reported being graduate students as evidenced in Table 3.

Table 3
Academic Classification of all Subjects

Classification	Number	Percent
Freshman	98	26.4
Sophomore	82	22.1
Junior	77	20.8
Senior	106	28.6
Graduate	7	1.9

The overwhelming majority of the sample reported being Caucasian at 84.1%. Of the sample 4.6% were Hispanic, 4.3% American Indian, 4.0% Black, 0.8% Asian/Pacific Islander, and 1.6% reporting Other (Table 4).

**Table 4
Ethnicity for all Subjects**

Ethnicity	Number	Percent
Caucasian	312	84.1
Hispanic	17	4.6
American Indian	16	4.3
Black	15	4.0
Asian/Pacific Islander	3	0.8
Other	6	1.6

Survey results yielded that 34.8% of students resided on campus while 63.6% resided off campus (Table 5). Further 22.6% were affiliated with Greek life, while 70.1% were Independent (Table 6).

**Table 5
Campus Residence**

Residence	Number	Percent
On Campus	129	34.8
Off Campus	236	63.6

**Table 6
Greek Affiliation**

Greek Affiliation	Number	Percent
Greek	84	22.6
Independent	260	70.1

Within this sample 53.9% of students reported being a combined-user while 44.5% of students drank alcohol-only. Within those reporting combined use, 36.2% were male and 61.8% were female. Within those reporting using alcohol only, 32.7% were males and 66.7% were females (Table 7).

**Table 7
Alcohol-Only and Combined-Use by Sex**

	Males	Females	Total
Combined-User	72	123	195
Alcohol-Only	56	114	170

Results

Hypothesis 1

Hypothesis one stated, there will be no significant difference in drinking motives between students who consume alcohol-only and those who combine alcohol and energy drinks.

The participants were split into two groups based on their reported drinking habits. Those participants who drank only alcohol and did not combine alcohol with

energy drinks were grouped into the alcohol-only group. Those participants who combined alcohol with energy drinks were grouped into the combined group. An independent *t*-test was used to test this hypothesis. One dependent variable (Total Drinking Motives Questionnaire Score for Alcohol) was used, and one independent variable (Combined-Use) was used in the analysis. The independent *t*-test analysis suggests that there was a statistically significant difference in drinking motives between the combined ($M = 48.90$, $SD = 12.89$) and alcohol-only groups ($M = 43.36$, $SD = 12.08$); $t(334) = 4.03$, $p < 0.000$ (two-tailed). Combined-users scored higher on the Drinking Motives Questionnaire than the alcohol-only users. This suggests that combined-users have higher amounts of motives to drink alcohol than those that drink alcohol-only. See Table 8 for details.

Table 8
Drinking Motives Scores in Combined-Users and Alcohol-Only Users

Group	N	Mean	Std. Dev.
Combined-Users	184	48.90	12.89
Alcohol-Only	152	43.36	12.08

Variable	t-value	Sig. (2 tailed)
Drinking Motives Score	4.03	0.000

Hypothesis 2

Hypothesis two stated there will be no significant differences in perceived positive reinforcements between students who consume alcohol-only and those who combine alcohol and energy drinks.

The participants were split into two groups based on their reported drinking habits. Those participants who drank only alcohol and did not combine alcohol with energy drinks were grouped into the alcohol-only group. Those participants who combined alcohol with energy drinks were grouped into the combined group. An independent *t*-test was used to test this hypothesis. One dependent variable (Total Positive Drinking Consequences Score for Alcohol) was used, and one independent variable (Combined-User) was used in the analysis. The independent *t*-test analysis suggests that there was a statistically significant difference in drinking motives between combine- users ($M = 32.91$, $SD = 10.13$) and alcohol-only ($M = 29.35$, $SD = 10.00$); $t(352) = 3.30$, $p < 0.001$ (two-tailed). Combined-users scored higher on the Positive Drinking Consequences Questionnaire than the alcohol-only users did. This suggests that combined-users derive more perceived positive reinforcements than those who drink alcohol-only (Table 9).

Table 9
Positive Drinking Consequences Scores in Combined-Users and Alcohol-Only Users

Group	N	Mean	Std. Dev.
Combined-Users	191	32.91	10.13
Alcohol-Only	163	29.35	10.00

Variable	t-value	Sig. (2 tailed)
Positive Drinking Consequences Score	3.30	0.001

Hypothesis 3

Hypothesis three stated that within combined users there will be no significant difference in Drinking Motives scores when they consume alcohol only compared to when they combine alcohol and energy drinks.

Participants in this analysis were limited to only those students who reported combining alcohol and energy drinks. Those students who reported drinking alcohol only were excluded from the analysis. A paired-samples *t*-test was used to test this hypothesis. The total scores of the Drinking Motives Questionnaire for alcohol-only and Drinking Motives Questionnaire for combined-use were paired for the analysis. The paired-samples *t*-test suggests that there was a statistically significant difference in the Drinking Motives scores between alcohol-only and combined-use. Scores for the alcohol-only questionnaire ($M = 49.29$, $SD = 13.03$) were significantly higher than scores for combined use ($M = 34.26$, $SD = 17.29$); $t(167) = 10.65$, $p < 0.000$ (two-tailed). Combined-users scored higher on the alcohol-only Drinking Motives scale than they did on the combined-use Drinking Motives scale. This suggests that combined-users have higher amounts of motives to drink alcohol-only than combine alcohol and energy drinks, as seen in Table 10.

Table 10
Drinking Motives Scores for Alcohol-Only and Combined-Use in Combined-Users

Scale	N	Mean	Std. Dev.
Alcohol-Only	168	49.29	13.03
Combined-Use	168	34.26	17.29

Pair	t-value	Sig. (2 tailed)
Drinking Motives Alcohol-Only Total - Drinking Motives Combined-Use	10.65	0.000

Hypothesis 4

Hypothesis four stated that within combined-users there will be no significant difference in Positive Drinking Consequences scores when they consume alcohol-only compared to when they combine alcohol and energy drinks.

Participants in this analysis were limited to only those students who reported combining alcohol and energy drinks. Those students who reported drinking alcohol only were excluded from the analysis. A paired-samples *t*-test was used to test this hypothesis. The total scores of the Positive Drinking Consequences Questionnaire for alcohol-only and Positive Drinking Consequences Questionnaire for combined-use were paired for this analysis. The paired-samples *t*-test suggests that there was a statistically significant difference in the Positive Drinking Consequences scores between alcohol-only and combined-use. Scores for the alcohol-only questionnaire ($M = 32.91$, $SD = 10.29$) were significantly higher than scores for combined use ($M = 25.00$, $SD = 13.12$); $t(180) =$

8.24, $p < 0.000$ (two-tailed). Table 11 displays that combined-users scored higher on the alcohol-only Positive Drinking Consequences scale than they did on the combined-use Positive Drinking Consequences scale. This suggests that combined-users derive more perceived positive reinforcements when drinking alcohol-only compared to combining alcohol with energy drinks.

Table 11
Positive Drinking Consequences Scores for Alcohol-Only and Combined-Use in Combined-Users

Scale	N	Mean	Std. Dev.
Alcohol-Only	181	32.91	10.29
Combined-Use	181	25.00	13.12

Pair	t-value	Sig. (2 tailed)
Positive Drinking Consequences Alcohol-Only Total – Positive Drinking Consequences Combined-Use	8.24	0.000

Hypothesis 5

Hypothesis five states there will be no significant difference between males and females in drinking motives within combined-users.

Participants in this analysis were limited to only those students who reported combining alcohol and energy drinks. Those students who reported drinking alcohol only were excluded from the analysis. An independent *t*-test was used to test this hypothesis. One dependent variable (Total Drinking Motives Questionnaire Score for Combined-Use) was used, and one independent variable (Sex) was used in the analysis. The independent *t*-test analysis suggests that there was not a significant difference in drinking motives between males ($M = 36.84, SD = 18.79$) and females ($M = 32.60, SD = 15.77$); $t(175) = 1.60, p < 0.111$ (two-tailed). This suggests that there is no statistically significant difference between males and females who combine alcohol and energy drinks within drinking motives (Table 12).

Table 12
Drinking Motives Scores for Males and Females in Combined-Users

Sex	N	Mean	Std. Dev.
Males	64	36.84	18.79
Females	113	32.60	15.77

Variable	t-value	Sig. (2 tailed)
Drinking Motives Score	1.60	0.111

Hypothesis 6

Hypothesis six states there will be no significant difference between male and females in perceived positive reinforcements within combined-users.

Participants in this analysis were limited to only those students who reported combining alcohol and energy drinks. Those students who reported drinking alcohol only

were excluded from the analysis. An independent *t*-test was used to test this hypothesis. One dependent variable (Total Positive Drinking Consequences Questionnaire Score for Combined-Use) was used, and one independent variable (Sex) was used in the analysis. The independent *t*-test analysis suggests that there is not a significant difference in positive drinking consequences between males ($M = 26.53$, $SD = 14.49$) and females ($M = 24.09$, $SD = 12.12$); $t(182) = 1.22$, $p < 0.223$ (two-tailed). This suggests that there was no difference between males and females who combine alcohol and energy drinks within perceived positive reinforcements, see Table 13.

Table 13
Positive Drinking Consequences Scores for Males and Females in Combined-Users

Sex	N	Mean	Std. Dev.
Males	67	26.53	14.49
Females	117	24.09	12.12

Variable	t-value	Sig. (2 tailed)
Drinking Motives Score	1.22	0.223

Hypothesis 7

Hypothesis seven states there is no relationship of the average amount of alcoholic drinks consumed on one occasion and perceived positive reinforcement in combined-users when they use alcohol-only.

Participants in this analysis were limited to only those students who reported combining alcohol and energy drinks. Those students who reported drinking alcohol only

were excluded from the analysis. The relationship between the average amount of alcoholic drinks consumed one occasion (as reported by participants) and positive consequences (as measured by the Positive Drinking Consequences Questionnaire for Alcohol-Only) was investigated using a Pearson product-moment correlation coefficient. Preliminary analyses were used to ensure there were no violations of the assumptions of normality, linearity, and/or homoscedasticity. There was a positive correlation between the two variables $r = .326$, $n = 191$, $p < 0.000$, with high levels of drinks consumed on one occasion and higher levels of perceived positive reinforcement. Average amount of drinks per occasion helps to explain only 10% of the variance in the respondents' scores on the Positive Drinking Consequences Questionnaire for Alcohol-Only. This suggests that as combined-users drink more alcoholic beverages they derive more perceived positive reinforcements (Table 14).

Table 14
Correlation of Average Drinks on One Occasion and Positive Drinking Consequences Questionnaire for Alcohol-Only Scores

Variables	N	r	Coe. Of Determination	Sig. (2 tailed)
Average Alcoholic Drinks Per Occasion and Positive Drinking Consequences Questionnaire for Alcohol-Only Scores	191	.326	.10	0.000

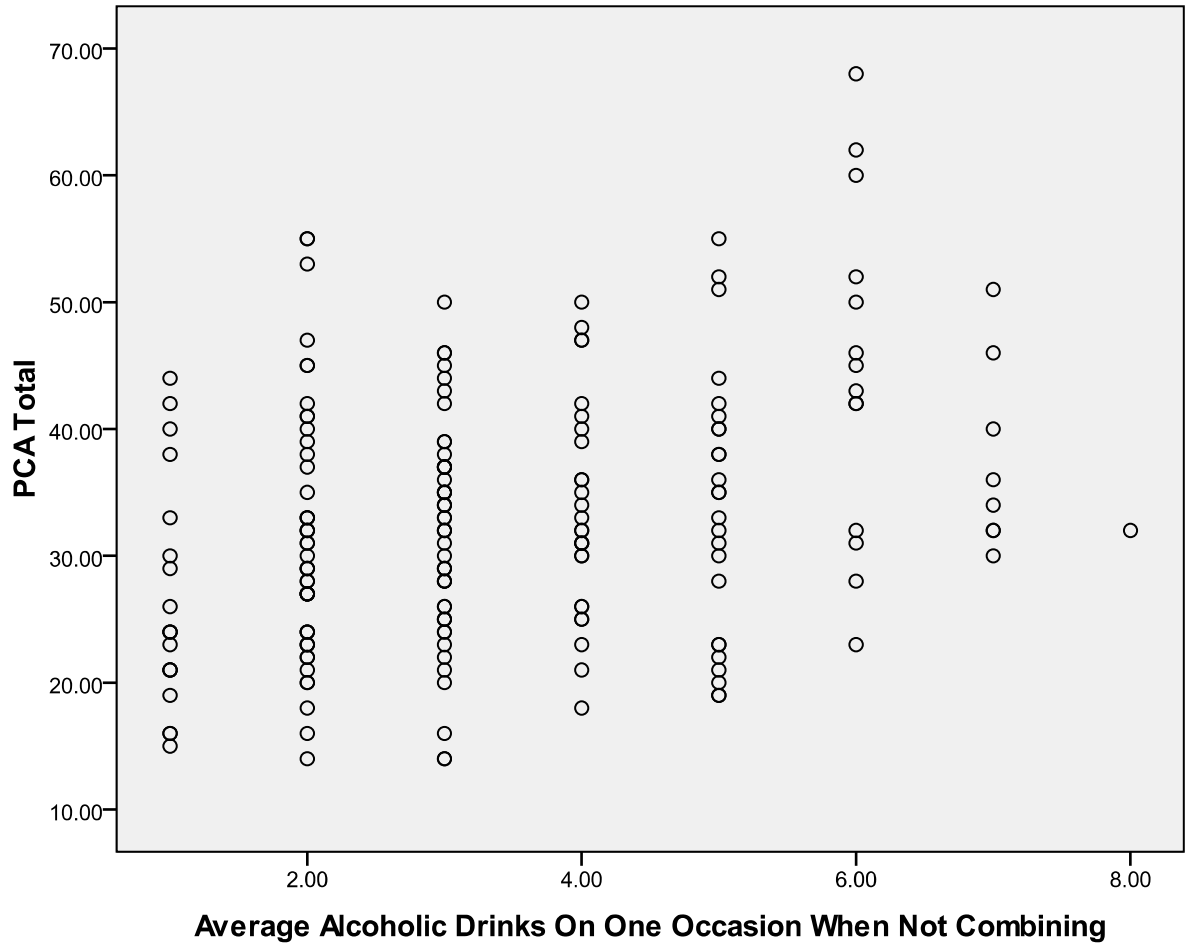


Figure 1
Average Amount of Alcoholic Drinks and Perceived Positive Reinforcements

Hypothesis 8

Hypothesis eight states there is no relationship of the average amount of alcohol consumed on one occasion and positive consequences in combined-users when they combine alcohol and energy drinks.

Participants in this analysis were limited to only those students who reported combining alcohol and energy drinks. Those students who reported drinking alcohol only were excluded from the analysis. The relationship between the average amount of alcoholic drinks consumed one occasion (as reported by participants) and positive

consequences (as measured by the Positive Drinking Consequences Questionnaire for Combined-Use) was investigated using a Pearson product-moment correlation coefficient. Preliminary analyses were used to ensure there were no violations of the assumptions of normality, linearity, and/or homoscedasticity. There was a positive correlation between the two variables $r = .3367$, $n = 183$, $p < 0.000$, with high levels of drinks consumed on one occasion and higher levels of perceived positive reinforcement. Average amount of drinks per occasion helps to explain only 13% of the variance in the respondents' scores on the Positive Drinking Consequences Questionnaire for Combined-Use. This suggests that as combined-users drink more combined drinks they derive more perceived positive reinforcements (Table 15).

Table 15
Correlation of Average Drinks on One Occasion and Positive Drinking Consequences Questionnaire for Alcohol-Only Scores

Variables	N	r	Coe. Of Determination	Sig. (2 tailed)
Average Alcoholic Drinks Per Occasion and Positive Drinking Consequences Questionnaire for Combined-Use Scores	183	.367	.13	0.000

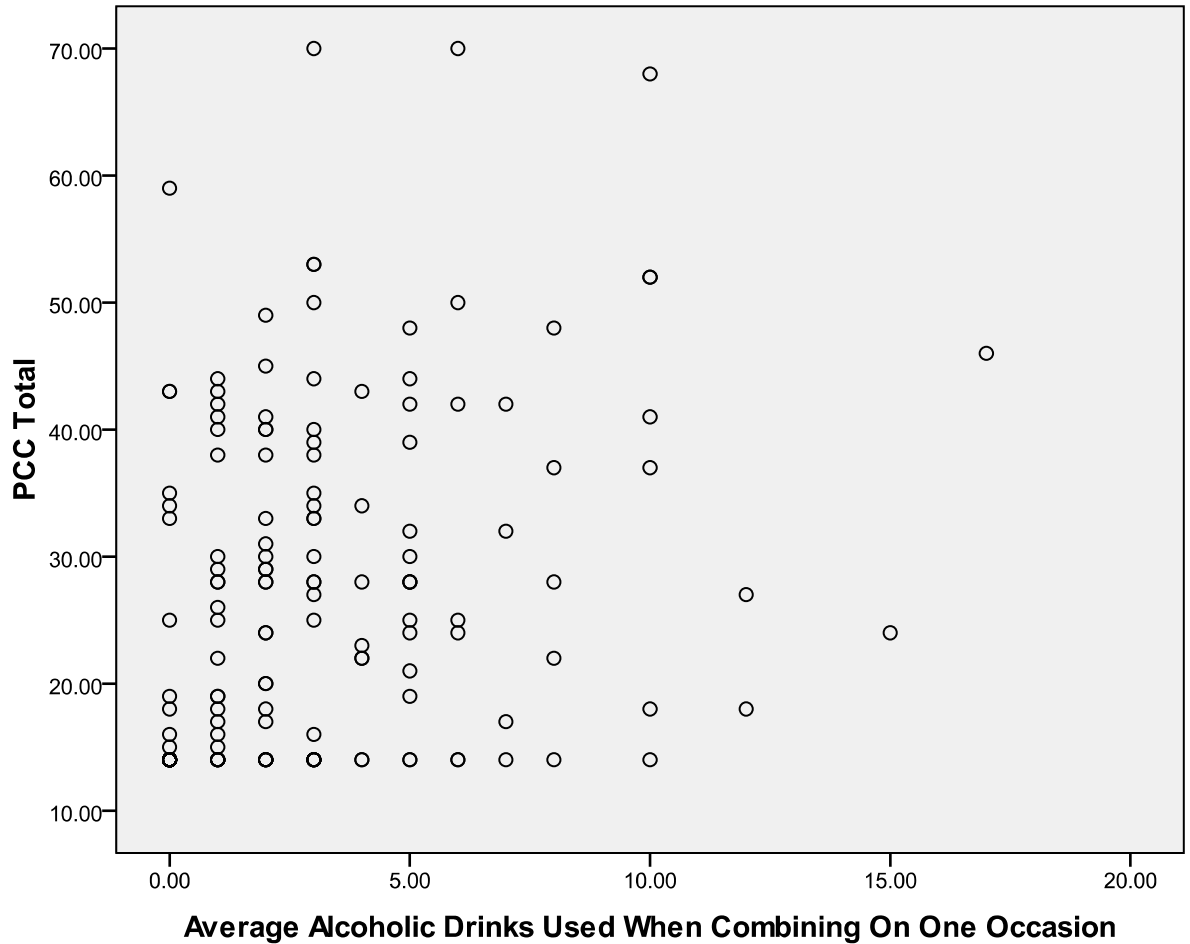


Figure 2
Average Amount of Combined Drinks and Perceived Positive Reinforcements

Discussion

Consistent with the literature, drinkers are motivated to drink and do experience perceived positive reinforcements. Findings from this research first suggest that combined-users differ in both their drinking motives and perceived positive reinforcements from their alcohol-only counterparts. This finding is a critical first step towards conceptualizing why these two groups engage in drinking behaviors. Health educators should use this evidence to improve the design of educational programs by matching them accordingly to the motives and experiences of each group.

The subset of combined-users is unique with their drinking motives and experiences. Unlike previous research, there appears to be no significant difference between the sexes in regards to drinking motives and perceived positive consequences. This finding suggests that in the future, education programs may want to look at this group as a whole while not being sex specific in regards to motives and perceived positive reinforcements; however more studies should be conducted to find if there are no sex differences. Combined-users are more motivated to drink alcohol-only and derive more perceived positive reinforcements from it, rather than combining. Educational programs in the future should first address the use of alcohol-only within this group and then look at their combined-use. Further, when combining or drinking alcohol-only, as combined-users drink more beverages, they perceive more positive reinforcements. This may lead to more episodes of binge drinking as well as more negative consequences. Combined-users could benefit from being taught alternative ways to experience true positive reinforcements at lower levels of drinking rather than attempting to drink larger amounts of alcohol to merely perceive that the reinforcements are positive.

CHAPTER V

CONCLUSION

Summary

The purpose of this study was to investigate differences in drinking motives and perceived positive reinforcements among a college student population comparing when they drank alcohol alone to when they combined alcohol and energy drinks. As a first step, it is important to understand if those who combine alcohol and energy drinks differ in their drinking motives and perceived positive reinforcements than those who only consume alcohol.

Subjects for this survey were recruited via e-mail as well as in person by professors from a wide array of disciplines throughout a Division-1 Midwestern University. Those who choose to participate were directed to an online survey which asked students to report their drinking motivations (as measured by the DMQR) and their perceived positive reinforcements (as measured by the PDCQ). Subjects were asked to report their motivations and perceived positive reinforcements for when they drank alcohol-only as well as when they combined alcohol and energy drinks. Demographic data collected in this study included information about participants such as sex, age, combined use, ethnicity, campus residence, Greek life, and educational classification. Select demographic variables were used to analyze differences and correlations in scores

on drinking motives and perceived positive reinforcements. There were 540 students who participated in this study; a final number of 371 subjects were used in data analysis. This study was conducted as a first step to investigate whether or not students who drink alcohol-only and students who combine alcohol and energy drinks differ in both motives and perceived positive reinforcements.

Findings

Overall, the findings from this study indicate that participants differ in regards to drinking motives and perceived positive reinforcements depending on if they combine alcohol and energy drinks or not. The amount of students who engaged in combined-use in this study (53%) coincides with previous research conducted on combined-use (Malinauskas et al., 2007; O'Brien et al., 2008; Woolsey, 2007; Woolsey, Kensinger, and Jacobson, 2009). Inconsistent with university enrolment, the sample in this study was skewed to Caucasian females. Within the largely female sample, 61.8% reported combining alcohol and energy drinks, while only 36.2% of males reported engaging in combined-use. This finding contrasts what has previously been reported by O'Brien et al., 2008 as well as Miller, 2008, where more males than females combined alcohol and energy drinks. This finding may be skewed due to the large female population in the sample.

Findings of the total scores of the DMQR for alcohol-only were consistent with prior research conducted by Kuntsche and Stewart (2009), however no previous research has examined differences in drinking motives between alcohol-only users and combined-users. Hypothesis one stated: There will be no significant difference in drinking motives between students who consume alcohol-only and those who combine alcohol and energy

drinks. Statistically significant differences were seen between these two groups, thus we are able to reject this hypothesis. Combined-users seem to have a higher motivation to drink alcohol than those who drink alcohol-only. Hypothesis two can also be rejected. This hypothesis stated: There will be no significant differences in perceived positive reinforcements between students who consume alcohol-only and those who combine alcohol and energy drinks. Combined-users were found to derive more perceived positive reinforcements when drinking alcohol compared to the alcohol-only group.

Although statistically significant, the difference between the mean scores of the two groups in both drinking motives and perceived positive reinforcements was quite small. Researchers must be careful in claiming real world significance with such a small variation in scores.

No prior research found has looked specifically at combined-users and differences between drinking motives and perceived positive reinforcements when they consume only alcohol compared to when they consume alcohol mixed with energy drinks. Findings from this study suggest that participants statistically differed in their scores between the two variables. Hypothesis three examined if there was a difference in drinking motives, within combined-users, when they drank only alcohol compared to when they combined alcohol and energy drinks. A significant difference was found depending if they combined alcohol and energy drinks or not. The researcher is able to reject this hypothesis, combined-users do have higher motives when they drink alcohol-only compared to when they combine alcohol and energy drinks. The same can be said in regards to perceived positive consequences. Hypothesis four stated: Within combined-users there will be no significant difference in Positive Drinking Consequences scores

when they consume alcohol-only compared to when they combine alcohol and energy drinks. Again, a significant difference was found and we are able to reject this hypothesis.

For both drinking motives and perceived positive reinforcements combined-users scored higher when using alcohol-only as compared to when they combined. This suggests that although participants chose to combine, they still had higher motives to drink only alcohol and derived more perceived positive reinforcements. This finding is interesting because it suggests that motives and perceived positive reinforcements may not fully lead them to combine alcohol and energy drinks. Scoring higher than their the alcohol-only group in both drinking motives and perceived positive reinforcements when drinking alcohol-only but having lower scores within their own group when looking at combined-use suggests that other factors may influence the practice of combining alcohol and energy drinks.

Hypothesis five examined differences in gender, within combined-users, on drinking motives scores. Hypothesis five stated: There will be no significant difference between males and females in drinking motives within combined-users. There were no significant differences found between genders in combined-users on the drinking motives score, thus we cannot reject this hypothesis. This study found that within combined-users, there was no difference in drinking motives scores between the genders. Studies by Baily et al., (2001) and Carman & Holmgren (2001) suggest that males and females have differing motives to drinking. Although the actual motives between the genders may be different, no significant difference was found in the overall score between sexes. This may suggest that combined-users, regardless of gender, derive the same amount of

motives, however they may be motivated to drink for different reasons. More research is needed to uncover if this is a special case within this sample, or if when looking at gender within combined-users, the two genders share the same drinking motives when combining.

Hypothesis six stated: There will be no significant difference between male and females in perceived positive reinforcements within combined-users. Results yielded no significant differences between genders within combined-users in over all perceived positive reinforcements, thus we cannot reject this hypothesis. Perceived positive reinforcements are specific outcomes that have been experienced by the participant while drinking. Park (2004) and Park & Grant (2005) have looked at perceived positive reinforcements when subjects consume alcohol only. In Parks (2004) first study men significantly reported more perceived positive reinforcements than women. The follow up study in 2005 showed no difference. In the current research study, the sample of combined users showed no significant difference was found between males and females in perceived positive reinforcements. Again, more research is needed to uncover if this is a special case within this sample, or if when looking at gender within combined-users, the two genders experience the same perceived positive reinforcements when combining.

Hypothesis seven and eight looked at the correlation of average amount of drinks per week and perceived positive reinforcements within combined users. Hypothesis seven stated: There is no relationship of the average amount of alcoholic drinks consumed on one occasion and perceived positive reinforcement in combined-users when they use alcohol-only. A correlation of .326 was found between these two variables, thus we can reject this hypothesis. The same can be said for hypothesis eight. Hypothesis eight stated:

There is no relationship of the average amount of alcohol consumed on one occasion and perceived positive reinforcements in combined-users when they combine alcohol and energy drinks. A correlation of .367 was found between the two variables, we can reject this hypothesis.

The average amount of drinks per week while combining showed a positive correlation with perceived positive reinforcements when drinking alcohol-only and while combining in this study. Although for this analysis the sample was limited to combined-users only, this current research supports previous findings on alcohol-only consumption in perceived positive reinforcements (Park, 2004; Park & Grant, 2005) that as average drinks per week increase, so do perceived positive reinforcements. The average amount of drinks per week is responsible for 10% of the shared variance in drinking alcohol only and 13% of the shared variance when combining in perceived positive reinforcements. The current research suggests that combined-users show a slightly stronger relationship with average amount drank and perceived positive reinforcements when they combine, rather than when they drink alcohol-only. Researchers must be aware that this is only a slight correlation between only the two variables of average drinks consumed per week and perceived positive reinforcements and that there are many other possible variables that influence this relationship.

Conclusions

From the analysis of the data collected from 371 participants it can be concluded that:

- (1) Statistically significant differences in both drinking motives as well as perceived positive reinforcements between those that drink only alcohol and those that combine alcohol and energy drinks.
- (2) Within participants who combined alcohol and energy drinks, there was a statistically significant difference in both drinking motives and perceived positive reinforcements both when they drank only alcohol and when they combined alcohol and energy drinks. Participants reported higher scores on both drinking motives as well as perceived positive reinforcements when they drank alcohol only as compared to when they drank alcohol mixed with energy drinks. However, when separated by gender no statistical significance was found in combined users between males and females in either drinking motives or perceived positive reinforcement scores when they combined alcohol and energy drinks.
- (3) A positive correlation was found with the average amount of alcohol drank per occasion and perceived positive reinforcements in combined users when only drinking alcohol. A positive correlation was also found in combined users when examining the average amount of alcohol drank per occasion when combining and perceived positive reinforcements. Although there were medium correlations found, the shared variance of each of these correlations was relatively small (10% for alcohol only and 13% for alcohol combined with energy drinks).
- (4) Drinking motives and perceived positive reinforcements still must be investigated further. Many studies have been conducted on alcohol use,

however very little research has been conducted on the combination of alcohol and energy drinks. This study is one of the first to suggest that combined-users are different than alcohol-only users on a variety of levels. Health educators must recognize these differences and begin to construct programs to better educate combined-users on the consequences of their actions.

Recommendations

Although the current study found many significant differences, the results may have somewhat limited generalizability. The sample tended to be very homogenous, with participants coming from a single university system. Most participants were Caucasian and a great majority of the population were female. Future research should include a much more diverse sample. For example, participants should be taken from more equal ethnic backgrounds, universities in different geographical areas, as well as a better balance of gender. Further, random sampling was not used; rather all responses came from a convenience sample.

The results from this study statistically suggest that combined-users are a special population of drinkers, with higher motives and perceived positive reinforcements than those who drink alcohol-only. This difference may be due to a large sample and power size. More research should be conducted to examine if the differences in scores has real world meaning. Future research should look at differences in the scores of sub scales within the DMQR to investigate where the differences lay as well as if one or more sub scales is skewing the total results in a certain direction. Research should also be conducted to see if certain populations may be skewing this data, by looking specifically

at certain populations and then comparing them to other populations as well as a well represented overall sample.

There is currently no instrument developed specifically for looking at combined-use in any capacity. Both the DMQR and PDCQ were designed for use looking at alcohol-only. Continued investigation into instrumentation should be conducted that focuses on the specific characteristics of combined-users. This will provide more accurate and sensitive results within this population.

This study did not look at the social environment or peer groups of either group. Kuntsche & Stewart (2009) and Kuntsche et al. (2008) found that many times drinkers conform to the standards and peer pressure of those around them. Participants may be inclined to choose one beverage over another or to drink for different reasons based upon their peer group or environment. More research is needed to investigate the impact that this plays in combine-use drinking behavior.

Findings in this study suggest that combined-users have higher drinking motivations and experience more perceived positive reinforcements than alcohol-only drinkers. However, when looking only at the combined-users, this group reports higher drinking motivations and experiencing more perceived positive reinforcements when drinking alcohol-only, compared to when combining. Future research should focus on other factors that may influence students to combine if they have less motivation and derive less perceived positive reinforcements when they combine rather than when they use alcohol-only.

Only small amount of shared variance accounted for the positive relationship between average amount of drinks per week and perceived positive reinforcements. In the

future, researchers should begin to look at other variables that may influence the extent of perceived positive reinforcements.

Assuming that the combined-users in this sample have received the same educational programs as their alcohol-only counter parts, this research suggests that they experience different outcomes and motivations. Future educational programs should be developed using intervention strategies such as Self-Determination-Theory and Motivational Interviewing which recognizes the importance of utilizing a person's past experiences and motivations to help them better foster an environment where health behavior change can be found. These strategies should be tailored to the unique needs of combined-users.

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APPENDICES

APPENDIX A

DEMOGRAPHIC QUESTIONS

Demographic Information

Year in school:

Freshman__

Sophomore__

Junior__

Graduate__

Age (must be 18 or older to participate) __

Reported Bodyweight:

< 100 lbs__

101-120 lbs__

121-140 lbs__

141-160 lbs__

161-180 lbs__

181-200 lbs__

201-220 lbs__

221-240 lbs__

>241 lbs__

Sex:

Male__

Female__

Race:

White/Non-Hispanic__

African American__

Hispanic__

Asian/Pacific Islander__

American Indian__

Other__

Campus Residence:

On Campus__

Off Campus__

Are you a member of:

Fraternity/Sorority: Yes__ No__

Intramural Athletics: Yes__ No__

Intercollegiate Athletics: Yes__ No__

Do you have access to:

Alcohol: Yes__ No__

Energy Drinks: Yes__ No__

Do you drink alcohol?: Yes__ No__

Have you combined alcohol and energy drinks?: Yes__ No__

At what age did you first drink an energy drink? ____

APENDIX B

QUNAITY/FREQUENCY INSTURNMENTS

INSTRUMENTS

All responses will be kept confidential

ALCOHOL-ONLY Quantity-Frequency Index

**A standard 'drink' of alcohol is defined as
1.5 oz. of 80 proof liquor (a 'shot'), 12 oz of beer, or 4-5 oz of wine**

One 750ml bottle of 80 proof liquor = 17 drinks



ALCOHOL-ONLY USE

In the last 30 days, how many occasions have you drank alcohol?

0__

1__

2__

3-4__

5-6__

7-8__

9-10__

11-12__

13-16__

17-19__

20-25__

26 or more__

On average, how many standard alcoholic drinks do you consume on a drinking occasion?
(**1.5 oz. of 80 proof liquor, 12 oz of beer, or 4-5 oz of wine**)

1-2 drinks__

3-4 drinks__

5-6 drinks__

7-8 drinks__

9-10 drinks__

11-12 drinks__

13-16 drinks__

17 or more drinks__

Over the last 30 days, how many times (if any) have you had five or more drinks in a row?

1__

2__

3-5__

6-9__

10 -12__

13-16__

17 or more__




In the past 30 days, what was the greatest number of alcoholic drinks you consumed in a row?

Alcoholic drinks_____

Over how many hours did you consume alcohol on this occasion? _____

COMBINED-USE Quantity-Frequency Index

Combined-use is either mixing energy drinks with alcohol or using an energy drink (ED) **within plus or minus 2 hours** of using alcohol. For example, if you consume energy drinks before going out to the bar, and then start drinking alcohol, this is still considered combined-use.

Not all energy drinks are the same. Please use the following serving sizes when answering the questions.	
	8 oz of standard energy drinks (Red Bull) = 1 Energy Drink
	2 oz Energy Shot = 1 Energy Drink
	16 oz Standard Energy Drinks (Monster, Full Throttle, Rockstar, etc) = 2 Energy Drinks



16 oz (NOS) = 3 Energy Drinks

8 oz (Spike, Redline) = 3 Energy Drinks

In the last 30 days, how many occasions have you combined alcohol and energy drinks?

0__

1__

2__

3-4__

5-6__

7-8__

9-10__

11-12__

13-16__

17-19__

20-25__

26 or more__

On average, how many standard alcoholic drinks do you consume on a combined-use drinking occasion?

Alcoholic Drinks _____

On average, how many standard energy drinks (8oz. ED or 2oz. energy shot) do you consume on a combined-use drinking occasion?

Energy drinks _____

In the last 30 days, how many times have you consumed had 3 or more combined drinks in a row?

1__

2__

3-5__

6-9__

10 -12__

13-16__

17 or more__

While combining in the last 30 days, what was the greatest number of alcoholic drinks you consumed in a row?

Alcoholic Drinks _____

Over how many hours did you combine on this occasion? _____

While combining in the last 30 days, what is the greatest number of energy drinks you consumed in a row?

Energy Drinks _____

Over how many hours did you combine on this occasion? _____

APPENDIX C

DRINKING MOTIVES QUESTIONNAIRE-REVISED

Alcohol Only DMQ-R

INSTRUCTIONS: Listed below are 20 reasons people might be inclined to drink **ALCOHOL ONLY**. Using the five-point scale below, decide how frequently your own drinking is motivated by each of the reasons listed.

	YOU DRINK ALCOHOL ONLY...	Almost Never/Never	Some of the time	Half of the time	Most of the time	Always
1.	To forget your worries.	1	2	3	4	
2.	Because your friends pressure you to drink.	1	2	3	4	
3.	Because it helps you enjoy a party.	1	2	3	4	
4.	Because it helps you when you feel depressed or nervous.	1	2	3	4	
5.	To be sociable.	1	2	3	4	
6.	To cheer up when you are in a bad mood.	1	2	3	4	
7.	Because you like the feeling.	1	2	3	4	
8.	So that others won't kid you about <i>not</i> drinking	1	2	3	4	

9.	Because it's exciting.	1	2	3	4
10.	To get high.	1	2	3	4
11.	Because it makes social gatherings more fun.	1	2	3	4
12.	To fit in with a group you like.	1	2	3	4
13.	Because it gives you a pleasant feeling.	1	2	3	4
14.	Because it improves parties and celebrations.	1	2	3	4
15.	Because you feel more self-confident and sure of yourself.	1	2	3	4
16.	To celebrate a special occasion with friends.	1	2	3	4
17.	To forget about your problems.	1	2	3	4
18.	Because it's fun.	1	2	3	4
19.	To be liked.	1	2	3	4
20.	So you won't feel left out.	1	2	3	4

COMBINED-USE DMQ-R

INSTRUCTIONS: Listed below are 20 reasons people might be inclined to COMBINE ALCOHOL AND ENERGY DRINKS. Using the five-point scale below, decide how frequently your own drinking is motivated by each of the reasons listed.

YOU COMBINE ALCOHOL AND ENERGY DRINK...		Almost Never/Never	Some of the time	Half of the time	Most of the time	Alr Always
1.	To forget your worries.	1	2	3	4	
2.	Because your friends pressure you to drink.	1	2	3	4	
3.	Because it helps you enjoy a party.	1	2	3	4	
4.	Because it helps you when you feel depressed or nervous.	1	2	3	4	
5.	To be sociable.	1	2	3	4	
6.	To cheer up when you are in a bad mood.	1	2	3	4	
7.	Because you like the feeling.	1	2	3	4	
8.	So that others won't kid you about <i>not</i> drinking	1	2	3	4	
9.	Because it's exciting.	1	2	3	4	
10.	To get high.	1	2	3	4	

11.	Because it makes social gatherings more fun.	1	2	3	4
12.	To fit in with a group you like.	1	2	3	4
13.	Because it gives you a pleasant feeling.	1	2	3	4
14.	Because it improves parties and celebrations.	1	2	3	4
15.	Because you feel more self-confident and sure of yourself.	1	2	3	4
16.	To celebrate a special occasion with friends.	1	2	3	4
17.	To forget about your problems.	1	2	3	4
18.	Because it's fun.	1	2	3	4
19.	To be liked.	1	2	3	4
20.	So you won't feel left out.	1	2	3	4

APPENDIX D

POSITIVE DRINKING CONSEQUENCES QUESTIONNAIRE

Alcohol Only PDCQ

INSTRUCTIONS: Please indicate how often you experience each of the following consequences of drinking **ALCOHOL ONLY**. Please do not report experiencing consequences simply because you believe that they ordinarily occur when you drink. Think about actual drinking occasions and report the consequences experienced on these occasions.

	YOU DRINK ALCOHOL ONLY...	Almost Never/Never	Some of the time	Half of the time	Most of the time	Always
1.	I approached a person that I probably wouldn't have spoken to otherwise.	1	2	3	4	
2.	I told a funny story or joke and make others laugh.	1	2	3	4	
3.	I revealed a personal feeling or emotion that I had previously kept secret.	1	2	3	4	
4.	I felt like I had enough energy to stay out all night partying or dancing.	1	2	3	4	
5.	In a situation in which I would usually have stayed quiet, I found it easy to make conversation.	1	2	3	4	
6.	I stood up for a friend or confronted someone who was in the wrong.	1	2	3	4	

7.	I found myself in a frightening situation and I felt surprisingly fearless.	1	2	3	4
8.	I found a creative solution to a problem I might otherwise have had difficulty solving.	1	2	3	4
9.	I felt especially confident that other people found me attractive.	1	2	3	4
10.	The intensity of a sexual experience was enhanced.	1	2	3	4
11.	I acted out a sexual fantasy that I might ordinarily be embarrassed to reveal or attempt.	1	2	3	4
12.	On a particularly stressful, I noticed a release of tension from my muscles and nerves.	1	2	3	4
13.	Something that would have ordinarily made me upset or emotional didn't really get me down.	1	2	3	4
14.	Things that I had been worrying about all day no longer seemed important.	1	2	3	4

Combined-Use PDCQ

INSTRUCTIONS: Please indicate how often you experience each of the following consequences of **COMBINING ALCOHOL AND ENERGY DRINKS**. Please do not report experiencing consequences simply because you believe that they ordinarily occur when you drink. Think about actual drinking occasions and report the consequences experienced on these occasions.

YOU COMBINE ALCOHOL AND ENERGY DRINKS...	Almost Never/Never	Some of the time	Half of the time	Most of the time	Alr Always
1. I approached a person that I probably wouldn't have spoken to otherwise.	1	2	3	4	
2. I told a funny story or joke and make others laugh.	1	2	3	4	
3. I revealed a personal feeling or emotion that I had previously kept secret.	1	2	3	4	
4. I felt like I had enough energy to stay out all night partying or dancing.	1	2	3	4	
5. In a situation in which I would usually have stayed quiet, I found it easy to make conversation.	1	2	3	4	
6. I stood up for a friend or confronted someone who was in the wrong.	1	2	3	4	
7. I found myself in a frightening situation and I felt surprisingly fearless.	1	2	3	4	

8.	I found a creative solution to a problem I might otherwise have had difficulty solving.	1	2	3	4
9.	I felt especially confident that other people found me attractive.	1	2	3	4
10.	The intensity of a sexual experience was enhanced.	1	2	3	4
11.	I acted out a sexual fantasy that I might ordinarily be embarrassed to reveal or attempt.	1	2	3	4
12.	On a particularly stressful, I noticed a release of tension from my muscles and nerves.	1	2	3	4
13.	Something that would have ordinarily made me upset or emotional didn't really get me down.	1	2	3	4
14.	Things that I had been worrying about all day no longer seemed important.	1	2	3	4

APPENDIX E

IRB FORM

Oklahoma State University Institutional Review Board

Date: Monday, September 14, 2009
IRB Application No ED09120
Proposal Title: Alcohol & Energy Drinks: College Students Drinking Motives and perceived Positive Reinforcement

Reviewed and Processed as: Exempt

Status Recommended by Reviewer(s): Approved Protocol Expires: 9/13/2010

Principal Investigator(s):

Weston Kensinger ✓
428 Willard
Stillwater, OK 74078

Conrad Woolsey
MH 2107, 700 N. Greenwood
Tulsa, OK 74106

Steven Edwards
325U Willard
Stillwater, OK 74078

The IRB application referenced above has been approved. It is the judgment of the reviewers that the rights and welfare of individuals who may be asked to participate in this study will be respected, and that the research will be conducted in a manner consistent with the IRB requirements as outlined in section 45 CFR 46.

The final versions of any printed recruitment, consent and assent documents bearing the IRB approval stamp are attached to this letter. These are the versions that must be used during the study.

As Principal Investigator, it is your responsibility to do the following:

1. Conduct this study exactly as it has been approved. Any modifications to the research protocol must be submitted with the appropriate signatures for IRB approval.
2. Submit a request for continuation if the study extends beyond the approval period of one calendar year. This continuation must receive IRB review and approval before the research can continue.
3. Report any adverse events to the IRB Chair promptly. Adverse events are those which are unanticipated and impact the subjects during the course of this research; and
4. Notify the IRB office in writing when your research project is complete.

Please note that approved protocols are subject to monitoring by the IRB and that the IRB office has the authority to inspect research records associated with this protocol at any time. If you have questions about the IRB procedures or need any assistance from the Board, please contact Beth McTernan in 219 Cordell North (phone: 405-744-5700, beth.mcternan@okstate.edu).

Sincerely,



Sheila Kennison, Chair
Institutional Review Board

APPENDIX F

COVER SHEET/INFORMED CONSENT

Cover Sheet/Informed Consent

- Project Title:** Alcohol & Energy Drink Use: College Student Drinking Motives and Perceived Positive Reinforcement
- Investigator:** Weston Kensinger, M.Ed
- Purpose:** The purpose of this study is to measure the use, motivations, and perceived positive reinforcements of drinking alcohol and energy drinks.
- Procedures:** If you choose to participate, you will be answering a series of questions about using alcohol and energy drinks. Participants will also be asked to answer a series of questions about the effects of alcohol and the combined use of alcohol and energy drinks. The survey will take about 20-30 minutes to complete
- Risks:** Participants will be asked to anonymously provide information about their alcohol use, which is an illegal behavior for those under the age of 21. However, this research is strictly confidential and the researchers have no personal identifiers to contact or personally identify participants. There are no other known risks associated with this project which are greater than those ordinarily encountered in daily life.
- Benefits:** Very few instruments exist and have been used to measure the use and effects of energy drinks and combined use. The information gathered from this study will help researchers develop future education and prevention programs.
- Confidentiality:** All information about you will be kept confidential and will not be released. Questionnaires and record forms will have identification numbers, rather than names, on them. The records of this study will be kept private. Any written results will discuss group findings and will not

include information that will identify you. Research records will be stored securely and only researchers and individuals responsible for research oversight will have access to them. It is possible that the consent process and data collection will be observed by research oversight staff responsible for safeguarding the rights and wellbeing of people who participate in research. This information will be saved as long as it is scientifically useful; typically, such information is kept for five years after publication of the results. Results of this study may be presented at professional meetings or in publications.

Compensation: Subjects who volunteer for this project and complete the survey may choose to be entered in a \$50 cash prize drawing. Students may choose to either complete the survey or not. This choice will not negatively affect on your grade in the class where you were recruited from.

Contact: Should you have any questions regarding this study, please contact:

Weston Kensinger, M.Ed
428 Willard Hall
Oklahoma State University
Stillwater, OK 74078
405-744-9334
weston.kensinger@okstate.edu

If you have questions about the research and your rights as a research volunteer, you may contact Dr. Shelia Kennison, IRB Chair, 219 Cordell North, Stillwater, OK 74078, 405-744-1676 or irb@okstate.edu.

Participant Rights: Participation in this project is voluntary. If at any time you wish to discontinue the activity, you may do so without any reprisal. By participating in this study, I indicate that I accept the aforementioned terms:

I understand the following:

1. I am free to discontinue participation during data collection at any time

2. ALL INFORMATION I PROVIDE IS STRICTLY CONFIDENTIAL and will be used for study purposes only.

3. I WILL REMAIN ANONYMOUS throughout the course of this study.

My agreement to take part in this study is signified by my participation.

APPENDIX G

SCRIPT

The purpose of this study is to measure the drinking motivations and perceived positive reinforcement of alcohol and energy drinks. The project will consist of participants filling out demographic information and answering questions about their quantity-frequency of use, motivations, and positive consequences of using energy drinks and alcohol. The entire study should take approximately 15 minutes to complete, with each section taking about 4 minutes. Subjects who volunteer for this project and complete the survey may choose to be entered in a \$50 cash prize drawing. Students may choose to either complete the survey or not. This choice will not negatively affect on your grade in the class where you were recruited from.

You may access the survey at: <http://frontpage.okstate.edu/coe/drinking>

As a participant in this study, I understand that:

1. This research is being conducted by Weston Kensinger
2. My participation in this study is completely voluntary. I am free to stop participating at any time by closing the survey webpage. If I do not volunteer or if my participation is ended for any reason by the researcher or me, it will have no effect on any other benefits to which I am normally entitled. In addition, I do not have to answer any item I do not wish to answer.
3. All of my responses are strictly confidential. In no way will my responses be linked back to me. To further protect my identity, my signature will not be included on this informed consent letter. The data from this study will be kept locked in a secure file which will only be accessible by the researchers.
4. The results of this research may be published or presented, and I will not be identified in any such publication.
5. This research is primarily aimed at helping present and future college students by better understanding the interaction between alcohol and energy drinks. The risk inherent in completing the questionnaires is no more than encountered in ordinary daily life. The researcher has provided an environment that allows for the privacy of my answers.
6. My questions about this study have been answered. I may address further questions to Weston Kensinger at weston.kensinger@okstate.edu

VITA

Weston S. Kensinger

Candidate for the Degree of Doctor of Philosophy

Dissertation: ALCOHOL & ENERGY DRINK USE: COLLEGE STUDENT DRINKING MOTIVES AND PERCEIVED POSITIVE REINFORCEMENT

Major Field: Health, Leisure, and Human Performance

Biographical:

Education: Graduated from Lower Dauphin High School, Hummelstown, Pennsylvania in June of 2000; received a Bachelor of Science degree in Allied Health Science from Bridgewater College, Bridgewater, Virginia in May of 2004; received a Master of Education in Health Education from The Pennsylvania State University, Harrisburg, Pennsylvania, in December 2006; completed requirements for the Doctorate of Philosophy with a major in Health, Leisure, and Human Performance in July, 2010.

Experience: Teaching assistant, Oklahoma State University, Department of Health Education, 3 years.

Professional Memberships: American College of Sports Medicine, American Psychological Association, American College Health Association, American Alliance for Health, Physical Education, Recreation and Dance, and American Association for Health Education.

Name: Weston S. Kensinger

Date of Degree: July, 2010

Institution: Oklahoma State University

Location: Stillwater, Oklahoma

Title of Study: ALCOHOL AND ENERGY DRINK USE: COLLEGE STUDENT DRINKING MOTIVES AND PERCEIVED POSITIVE REINFORCEMENT

Pages in Study: 125

Candidate for the Degree of Doctor of Philosophy

Major Field: Health, Leisure, and Human Performance

Scope and Method of Study: The purpose of this study was to uncover differences in drinking motives and perceived positive reinforcements between students who drink only alcohol and those who combine alcohol and energy drinks. A convenience sample of 540 college students from four campuses at a Division-1 Midwestern University were used in this study. Participants were recruited by professors with knowledge of the study and were directed to a web-based survey where they answered questions on drinking quantity and frequency, drinking motives, perceived positive reinforcements, and demographic information. Independent and dependent *t*-tests were used to analyze differences between alcohol only and combined users as well as to uncover differences within the combined user group. Pearson product-moment correlations were also used to assess the relationship of quantity of drinks to perceived positive reinforcements within combined users when they drank alcohol only and when they combined.

Findings and Conclusions: The findings of this study suggest that there are differences in both drinking motives and perceived positive reinforcements between college students who drink alcohol only and those who combine alcohol and energy drinks. Combined users scored higher on both drinking motives and perceived positive reinforcements than their alcohol only peers. Further analysis suggests that within combined users, they are more motivated and have more perceived positive reinforcements when they drink alcohol only compared to when they combine. No significant differences in gender were found. The amount of drinks a combined user drank was positively correlated with an increase in perceived positive consequences. These findings suggest that future alcohol education programs take these differences into account to become more effective.

ADVISORS APPROVAL: Dr. Steve Edwards