

USING THE THEORY OF PLANNED BEHAVIOR TO PREDICT
EXTREME RITUALISTIC ALCOHOL CONSUMPTION ON GAME DAY

By

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Dedicated to the Gator Nation

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TABLE OF CONTENTS

	<u>Page</u>
ACKNOWLEDGMENTS	4
LIST OF TABLES	9
LIST OF FIGURES	11
ABSTRACT	12
CHAPTER	
1 INTRODUCTION	14
Research Problem	16
Purpose of the Study	18
Significance of the Study	19
Research Questions	21
Delimitations	21
Limitations	22
Assumptions	22
Definition of Terms	23
Summary	25
2 REVIEW OF THE LITERATURE	26
Factors Associated with 5+4+ Drinking	26
Personal Risk Factors	27
Environmental Risk Factors	29
Consequences Associated With 5+4+ Drinking	31
Game Day Drinking Behaviors	34
Social Marketing and Alcohol Use	38
Social Norm Campaigns	40
Theory of Reasoned Action (TRA) and Theory of Planned Behavior (TPB)	43
Theory of Planned Behavior and Alcohol Use	48
Alcohol Consumption Measures	52
Summary	55
3 METHODS	58
Research Design	58
Research Variables	60
Attitude Toward the Behavior	61
Behavioral Beliefs	61
Evaluation of Behavioral Outcomes	61

	Subjective Norm.....	61
	Normative Beliefs.....	62
	Motivation to Comply	62
	Perceived Behavioral Control.....	62
	Control Beliefs.....	62
	Perceived Power	63
	Behavioral Intention.....	63
	Behavior	63
	Study Population.....	65
	Instrumentation.....	66
	Internal Consistency	71
	Data Collection	72
	Data Analysis.....	75
	Research Question 1:.....	76
	Research Question 2:.....	76
	Research Question 3:.....	78
	Research Question 4:.....	78
	Research Question 5:.....	78
	Research Question 6:.....	79
	Summary.....	80
4	RESULTS	95
	Participant Characteristics	96
	Research Questions.....	97
	What is the Prevalence of Extreme Ritualistic Alcohol Consumption on a Typical Game Day for Fall 2006?.....	97
	How Much Variance Does the Combination of Constructs in the Theory of Planned Behavior Explain When Predicting Extreme Ritualistic Alcohol Consumption on Game Day?.....	99
	Which Constructs within the Theory of Planned Behavior Account for the Largest Proportion of Variance when Predicting Extreme Ritualistic Alcohol Consumption Behavior among College Students on Game Day?.....	100
	Do the Constructs within the Theory of Planned Behavior Differ by Gender When Predicting Extreme Ritualistic Alcohol Consumption among College Students on Game Day?.....	101
	Do the Constructs within the Theory of Planned Behavior Differ by Grade Classification When Predicting Extreme Ritualistic Alcohol Consumption among College Students on Game Day?.....	103
	What Are the Causal Effects in Predicting Alcohol Consumption Rates Using the Constructs from the TPB?.....	106
	Summary.....	108
5	SUMMARY, DISCUSSION, IMPLICATIONS, CONCLUSIONS.....	116
	Summary.....	116
	Limitations.....	119

Discussion.....	123
Implications	131
Recommendations.....	132
Future Research	132
Practice	133
Conclusion.....	134

APPENDIX

A UF GAME DAY SURVEY.....	137
B GAME DAY SURVEY IRB	148
C GAME DAY SURVEY E-MAIL INSTRUCTIONS	150
LIST OF REFERENCES.....	151
BIOGRAPHICAL SKETCH	165

LIST OF TABLES

<u>Table</u>	<u>page</u>
2-1 Summary of the TPB alcohol related articles.....	57
3-1 Game day TPB Attitude Toward Behavior direct and indirect measures	81
3-2 Game day TPB Subjective Norm direct and indirect measures	82
3-3 Game day TPB Perceived Behavioral Control direct and indirect measures.....	83
3-4 TPB Attitude Toward Behavior items and reliability values from the literature	84
3-5 TPB Subjective Norm items and reliability values from the literature	85
3-6 TPB Perceived Behavioral Control items and reliability values from the literature.....	86
3-7 Game day test-retest demographic items.....	87
3-8 Game day test-retest prevention items	87
3-9 Game day test-retest drinking items.....	88
3-10 Game day test-retest alcohol consequence items	88
3-11 Game day test-retest social norm items.....	889
3-12 Game day test-retest Attitude Toward the Behavior indirect and direct items	889
3-13 Game day test-retest Subjective Norm indirect and direct items	90
3-14 Game day test-retest Perceived Behavioral Control indirect and direct items.....	91
3-15 Game day test-retest Behavioral Intention items	91
3-16 Game day scale reliability	92
4-1 Participant demographics compared to UF student population fall 2006	109
4-2 Chi-square analysis of ERAC rates by gender	109
4-3 Chi-square analysis of ERAC rates by classification.....	109
4-4 Chi-square analysis of ERAC rates by ethnicity	110
4-5 Chi-square analysis of ERAC rates by greek status	110
4-6 Chi-square analysis of ERAC rates by legal drinking age	110

4-7	5+4+ drinking and ERAC rates by demographic	111
4-8	Correlation analysis of direct TPB composite measures and behavioral intention.....	111
4-9	Logistic regression analysis TPB composite measures—ERAC	111
4-10	Logistic regression analysis TPB composite measures—ERAC women	112
4-11	Logistic regression analysis TPB composite measures—ERAC men	112
4-12	Logistic regression analysis TPB composite measures—ERAC juniors	112
4-13	Logistic regression analysis TPB composite measures—ERAC seniors.....	112
4-14	Logistic regression analysis TPB composite measures—ERAC graduate and professional students	113
4-15	Logistic regression analysis TPB composite measures—ERAC underage drinkers	113
4-16	Logistic regression analysis TPB composite measures—ERAC legal drinking age	113
4-17	Goodness of fit measures for TPB composite measures model tests	113
4-18	Standardized effects on Behavioral Intention and number of drinks consumed on game day.....	113
4-19	Goodness of fit measures for TRA composite measures model tests	113

LIST OF FIGURES

<u>Figure</u>	<u>page</u>
2-1 TPB constructs.....	57
4-1 Path analysis from TPB composite measures.....	115
4-2 Path analysis from TRA composite measures	115

Abstract of Dissertation Presented to the Graduate School
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By

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Alcohol abuse remains a serious health issue for colleges and universities across the country. A particular area of concern involves the drinking that takes place before, during, and after college football games. This study examined this specific type of drinking behavior, termed “Extreme Ritualistic Alcohol Consumption” (ERAC), and whether the Theory of Planned Behavior (TPB) explains drinking patterns on game day among college students at a large university in the southeastern United States. The definition of ERAC, based on a previously validated measure, consists of consuming 10 or more drinks on game day for a male and eight or more drinks for a female.

The purposes of this study were to determine the prevalence of ERAC on game day, assess the extent to which the TPB predicted ERAC, and determine the causal relationships among the TPB variables. Data were collected from a random sample of 740 college students who completed an anonymous online survey. Survey items assessed participants’ motivations for consuming alcohol and the total number of drinks consumed on game day.

Sixteen percent of the respondents engaged in ERAC on game day. Male, Caucasian, Greek, and students of legal drinking age consumed alcohol at disproportionately high rates.

With the exception of Perceived Behavioral Control (PBC), each of the TPB constructs was statistically significant in predicting ERAC. Behavioral Intentions to drink alcohol on game day predicted behavior. Intentions, in turn, were predicted by Attitude Toward the Behavior and Subjective Norm constructs. The TPB was useful in explaining alcohol use on game day with college students. However, the applicability of the PBC construct within the TPB model remains in question. Additional research with more effective PBC measures is needed before more definitive statements can be made concerning the TPB's efficacy in predicting college student alcohol consumption on game day.

Alcohol use is common on game day, with a significant percentage of students placing themselves at risk by drinking large amounts of alcohol. To reduce alcohol abuse on college campuses, university officials need to implement and rigorously evaluate specific game day interventions.

CHAPTER 1 INTRODUCTION

Alcohol misuse represents a serious health issue for colleges and universities across the country (Walters & Bennett, 2000). Surveys indicate that the majority of college students drink regardless of their age and that approximately two out of every five college students consume five or more drinks, four or more for a female, at least once in the last two weeks (Hingson, Heeren, Zakocs, Kopstein, & Wechsler, 2002). This type of drinking, commonly referred to as heavy episodic drinking (Wechsler, Lee, Kuo, Seibring, Nelson, & Lee, 2002), from this point forward will be referred to simply as “5+ 4+” drinking. Consuming 5+4+ alcoholic drinks is associated with unintentional injury (e.g., motor vehicle crashes, falls, and drownings), sexually transmitted diseases, unintended pregnancy, sexual assault, violence, and poor academic performance (Kuo, Wechsler, Greenber, & Lee, 2003; Naimi, Brewer, Mokdad, Denny, Serdula, & Marks, 2003). The National Institute on Alcohol Abuse and Alcoholism (NIAAA) estimated that over 1,700 student deaths, 599,000 injuries, and 696,000 assaults annually are associated with consuming 5+4+ drinks (Hingson, Heeren, Winter, & Wechsler, 2005).

Those who consume 5+4+ drinks not only place themselves at increased risk for health consequences, they also affect others with their drinking. Wechsler and colleagues (2002) describe this phenomenon as “secondhand” drinking effects. They found in a national survey that a substantial percentage of students experienced the following negative effects from their peers’ drinking: 60% of students surveyed had their study or sleep interrupted, 48% reported having to take care of a drunken student, and 29% reported being insulted or humiliated. In addition, 55% indicated that they experienced at least two secondhand effects. These patterns have remained consistent over the last decade (Wechsler et al., 2002).

According to the Carnegie Foundation for the Advancement of Teaching, 5+4+ drinking represents the greatest single problem that America's universities must address (NIAAA, 2002a). Student death, injury, poor academic performance, property damage, vandalism, strained campus-community relations, and negative publicity are all issues that university presidents and other senior administration officials must manage because of alcohol abuse (Higher Education Center for Alcohol and Other Drug Prevention, 1997). Further, based on the Diagnostic and Statistical Manual of Mental Disorders, 4th Edition, nearly one-third of college students meet the criteria for a formal diagnosis of alcohol abuse, and one in 17 can be classified as alcohol dependent (Wechsler et al., 2002). Ironically, epidemiological studies show that college-bound high school students drank less than their non-college-bound peers. However, upon arriving at institutions of higher education, college students drank more than their same age counterparts who did not attend college (Johnston, O'Malley, & Bachman, 2001).

National data indicate that certain groups of college students are at more risk than others. Overall, men are more likely to consume five or more drinks than women are to consume four or more drinks, 49% vs. 41% respectively. Caucasians engaged in this behavior (50%) at higher rates than Hispanics (34%), Native American Indians (34%), Asians/Pacific Islanders (26%), and Blacks/African-Americans (22%). Students under the age of 21 engaged in 5+4+ drinking slightly less (44%) than students ages 21-23 (50%); similar patterns exist between underclassmen and upperclassmen. Finally, students who live onsite at a fraternity or sorority (75%), or who are members of a nonresidential fraternity or sorority (64%) report the highest rates of 5+4+ drinking (Wechsler et al., 2002).

Research Problem

The University of Florida, which annually ranks as a “Top Party School” (The Associated Press, August 23, 2005), has experienced a number of alcohol-related tragedies in recent years. According to the *Gainesville Sun*, from 2003-2005, there were six alcohol-related deaths among UF students, including incidents on and off campus (Arndorfer, 2005; Word, 2005). In two separate events, UF students died as a result of falling from a height. Causes of the other four fatalities include a car crash, hit and run crash, suffocation, and another where a student was brutally beaten to death. In addition, the high-risk drinking rate, defined as consuming five or more drinks on a single occasion during the past two weeks (Johnston, O’Malley, Bachman, & Schulenberg, 2005), among UF students increased to an all time high of 57% in 2004. (Hereafter the term high-risk drinking will be referred to as 5+ drinks, with no gender distinction.) This marker represents a considerable difference from the *Healthy Campus 2010* goal of reducing the 5+4+ drinking rate to 20% or lower by the year 2010 (American College Health Association, 2002).

The following statistics provided additional indicators of problem drinking behaviors and consequences among UF students. In the fall of 2004, 473 UF students completed the Core Alcohol and Drug Survey Long Form (a standardized instrument specifically designed for college students). While most students drink in moderation or not at all, a significant percentage experienced alcohol related consequences in the past year: 38% reported driving a car while under the influence, 44% reported missing a class, 25% performed poorly on a test or project, 42% had a blackout, 66% vomited, and 70% reported experiencing a hangover. Approximately, two-thirds (64%) of UF students believe that alcohol facilitates sexual opportunities. Despite the national minimum legal drinking age of 21, nearly 75% of students reported engaging in

underage drinking. In addition, approximately 209 students received treatment in the campus mental health department for alcohol or other drug counseling. During the 2003-2004 school year, 179 students were found responsible for alcohol violations. Finally, in 2003 there were 56 DUI (Driving Under the Influence) arrests made on the University of Florida campus (UF Biennial Review, 2004).

One of the most prominent, if not symbolic, challenges surrounding college prevention efforts involves game day (football) (Glassman, Werch, Jobli, & Bian, 2007). A substantial number of alumni, students, and other football fans engage in 5+ drinking activities on game day. Most fans who consume alcohol will simply experience a minor consequence (such as a hangover), if any at all; however, for a select few, the results can be devastating. For example, when UF hosted the Tennessee Volunteers in the fall of 1999, an alcohol-related fight resulted in the death of two young adults (Swirko, 2000). In the fall of 2004 at the Florida/Georgia game held in Jacksonville (also known as the “Worlds Largest Cocktail Party”) (Arndorfer, 2005), a UF student fell to his death from a parking garage. A year later at the same location, another UF student was brutally beaten to death after the football game (Arndorfer, 2005).

Other Game Day Survey results substantiate the public health concern. Data from the UF Game Day Survey conducted in 2004 indicate that among those students who drank, 73% typically engage in 5+ alcohol consumption on game day. Further, over 70% of the students who drank reported experiencing a hangover due to drinking on game day, 29% vomited, 30% drove after drinking, 15% drove after having five or more drinks, 33% blacked out, and 21% got into a fight or an argument. Males reported drinking more than females, and students drank more than nonstudents such as alumni and other fans (Glassman et al., 2007). These game day drinking patterns may increase the school’s 5+ drinking rate for the fall semester. Cross sectional data

collected annually at UF indicated that students engaged in 5+ drinking at higher rates in the fall than they did in the spring (GatorWell Health Promotion Services, 2006). While there are a variety of possible explanations for this phenomenon, the fact that there are no college football games in the spring has to be considered as a variable for this discrepancy.

Game day represents a unique social event where, alcohol is consumed with greater intensity and for a longer time than at other social events (Glassman et al., 2007). However, White, Kraus, and Swartzweider (2006) suggest that the standard 5+4+ drinking measure does not adequately capture how heavily people actually drink and consequently may not accurately indicate their risk. Instead they recommend doubling the 5+4+ drinking threshold to identify more dangerous drinking patterns. While implementing this recommendation, a customized term with previously identified measure (White et al., 2006) were developed for this investigation: Extreme Ritualistic Alcohol Consumption (ERAC), defined as consuming 10 or more drinks on game day for a male and eight or more drinks for a female. This study focuses on this term and measure, which are used to discuss the research questions and related analyses.

Purpose of the Study

The aim of this investigation was to examine alcohol consumption patterns among college students on game day. Specifically, the purposes were to (a) assess the prevalence of “Extreme Ritualistic Alcohol Consumption” among University of Florida male and female students ages 18-24 on college football Saturday; (b) determine the extent to which the Theory of Planned Behavior (TPB) can be used to predict ERAC rates among college students; and (c) assess the causal path among the TPB variables related to alcohol consumption on game day.

Significance of the Study

The national 5+4+ drinking rate has remained remarkably stable over the last decade despite increased attention and resources directed toward the issue (Wechsler et al., 2002). While there is considerable research on college students and 5+4+ drinking, little research exists on effective, non-policy, population-based interventions. Dejong and colleagues (1998) contend that the key to reducing 5+4+ drinking centers on *environmental management*. One of the hallmarks of environmental management involves the creation of a health-promoting normative environment. A number of schools have addressed this need by implementing a social norms campaign (Perkins, 2003).

Social norm interventions rest on the assumption that the behaviors of people are influenced by their peers or at least their perceptions of their peers. This concept is sometimes referred to as *imaginary peers*. Because it is difficult to know the actual behaviors of peer group(s), people make generalizations and form perceptions about the group's behavior. Research indicates that college students grossly overestimate the amount of alcohol their peers consume. Leading scholars in the field maintain that if those misperceptions can be corrected, the corresponding drinking rates will fall. The finding that students who overestimate the 5+ drinking rate are more likely to engage in this behavior themselves has been well documented (Haines, 1998; Perkins, 2003; Thombs, et al., 2005).

Social norm campaigns have become widely disseminated intervention strategies employed by universities throughout the country (Wechsler, Toben, Lee, Seibring, Lewis, & Keeling, 2003), although research assessing the effectiveness of these interventions is scarce and the results are inconsistent. While the NIAAA's (2002b) *Call to Action: Changing the Culture of Drinking at U.S. Colleges* lists the use of a social norms approach to alcohol consumption as a

promising practice, other prominent alcohol researchers such as Wechsler (2002) are more skeptical. Thombs and colleagues' (2005) study on social norms found that traditional social norms campaigns, which highlight the fact that "Most Students Have Zero to Four Drinks When They Party," failed to reduce the 5+ drinking rate and may not even have corrected the misperceptions regarding alcohol use. Thombs and colleagues cautioned that while the conceptual underpinnings of the social norms theory may still have potential, there is a need to develop more effective applications of the model.

The Theory of Planned Behavior (TPB) represents a comprehensive theory that includes multiple factors to explain health behavior, whereas social norm interventions simply attempt to correct the misperceptions people evoke concerning the perceived prevalence of a behavior. Further, unlike social norm interventions, the Subjective Norm construct within TPB addresses the Motivation to Comply with normative beliefs, which is extremely useful in shaping normative behavior. Another fundamental construct incorporated into the Theory of Planned Behavior is the Attitude Toward the Behavior. Youth tend to have very favorable attitudes concerning alcohol, in part due to marketing efforts by alcohol producers and retailers (Chen, Grube, Bersamin, Waiters, & Keefe, 2005). Thus, simply correcting misperceptions concerning the 5+ drinking rate is likely to yield limited behavior change.

The Theory of Reasoned Action and its extension the Theory of Planned Behavior, which includes perceived control, are useful when designing interventions. To date, few alcohol messages targeting college students address perceived control. Further, very little information exists on specific game day drinking patterns, especially from a theoretical framework. Thus identifying which of the TPB constructs influence game day drinking among college students can produce more effective communication methods.

Reducing the number of alcohol related incidents associated with excessive alcohol consumption remains a public health priority. This is particularly important for game day, which represents a high-risk event, as well as a neglected prevention venue. The findings from this study will be used to create health promotion messages which can be implemented and later evaluated for their effectiveness.

Research Questions

The research questions for this study include:

- What is the prevalence of Extreme Ritualistic Alcohol Consumption on a typical game day for fall 2006?
- How much variance does the combination of constructs in the Theory of Planned Behavior explain when predicting Extreme Ritualistic Alcohol Consumption on game day?
- Which constructs within the Theory of Planned Behavior (Subjective Norm, Attitude Toward the Behavior, Perceived Behavioral Control, and Behavioral Intention) account for the largest proportion of variance when predicting Extreme Ritualistic Alcohol Consumption behavior among college students on game day?
- Do the constructs within the Theory of Planned Behavior differ by gender when predicting Extreme Ritualistic Alcohol Consumption among college students on game day?
- Do the constructs within the Theory of Planned Behavior differ by grade classification when predicting Extreme Ritualistic Alcohol Consumption among college students on game day?
- What are the causal effects in predicting alcohol consumption rates using the constructs from the Theory of Planned Behavior?

Delimitations

The following delimitations should be considered when interpreting the results of this inquiry:

- Cross-sectional data were collected for this investigation utilizing a web-based survey.
- Participants in this study included college students, aged 18 to 24, enrolled at UF during the fall 2006 semester.

- A list of survey participants was randomly selected by the UF Registrar.
- Participants included students from the study population who agreed voluntarily to participate in the study.
- Findings from this study were based on self-report data collected by using the Game Day Survey.
- The collection of data occurred at a single point in time after the last home football game of the season.

Limitations

The following limitations should be considered when interpreting the results from this investigation:

- Data collected from this cross-sectional survey design reflect responses from participants at a specific time; thus, causation cannot be established.
- Findings from this investigation cannot be generalized to other populations of college students.
- Students who did not voluntarily agree to participate were excluded from the study.
- Variations in student participation may have influenced the results of this study.
- The self-reported data collected for this investigation limits the ability to determine the extent of over-reporting or under-reporting data.

Assumptions

For the purposes of this investigation, the following assumptions were made:

- The registrar provided current and accurate student e-mail addresses. Students are assigned a UF e-mail account; however, select students may have dropped out of school or changed their e-mail addresses, thus potentially influencing the response rate.
- Every participant had access to the internet. The University of Florida provides internet access to currently enrolled students at various venues throughout campus.
- The invitation to participate in the survey reached the intended audience. E-mail software programs may automatically send mass e-mail solicitations to a “junk” e-mail folder. As a result, students may not have been aware of their invitation to participate in the study.

- The students who participated in the study were representative of the overall student population unless otherwise noted. The registrar provided a random list of students to participate in the study.
- The students who agreed to participate in the study answered survey questions honestly. In the survey description, students were assured of their anonymity and were encouraged to answer questions honestly.

Definition of Terms

- **Attitude:** Overall evaluation of a behavior determined by individuals' beliefs concerning the outcomes or attributes of performing the behavior (Glanz, Rimer, & Lewis, 2002).
- **Behavioral Belief:** An indirect measure of attitude where individuals assess whether their actions or potential actions are associated with certain attributes or outcomes (Glanz et al., 2002).
- **Behavioral Intention:** Perceived likelihood of performing the behavior of interest (Glanz et al., 2002).
- **Heavy episodic drinking:** Consumption of five or more drinks in a row for men and four or more drinks for women, at least once in the previous 2 weeks (Wechsler et al., 2002).
- **College student:** Random selection of individuals ages 18-24 years old who are registered to attend the University of Florida.
- **Control Beliefs:** An indirect measure of Perceived Behavioral Control, where individuals assess the presence or absence of facilitators and barriers to behavioral performance (Glanz et al., 2002).
- **Drink:** A standard drink equal to 12 ounces (oz) of beer, 12 oz of wine cooler, 5 oz of wine, or 1.25 oz of liquor either straight or in a mixed drink (White, Kraus, & Swartzwelder, 2006; Wechsler et al., 2002).
- **Drunk:** Consumption of alcohol to the point of impairing one's mental and physical abilities. In the state of Florida a person with a blood alcohol level equal to or exceeding 0.08 mg/dl (milligrams per deciliter of blood) is considered legally intoxicated or drunk.
- **Evaluation of Behavioral Outcomes:** An indirect measure of attitude, where individuals assess the value attached to a belief or associated with an activity or attribute (Glanz et al., 2002).
- **Extreme Ritualistic Alcohol Consumption (ERAC):** Consumption of eight or more drinks for females and 10 or more drinks for males, in relation to a specific event such as

game day, an event that is culturally associated with drinking patterns higher than those of typical social occasions.

- **Game day:** A typical home football game including tailgating activities on or off campus, before, during, and after the game.
- **High-risk drinking:** Consumption of five or more drinks on a single occasion during the previous two weeks (Johnston et al., 2005).
- **Motivation to Comply:** An indirect measure of the Subjective Norm where individuals assess their intrinsic drive to act in accordance with what they perceive their key referents deem appropriate concerning the behavior of interest (Glanz et al., 2002).
- **Normative Belief:** An indirect measure of the Subjective Norm where individuals assess the extent to which each referent approves or disapproves of the behavior of interest (Glanz et al., 2002).
- **Perceived Behavioral Control:** The degree to which individuals believe they have control over their actions (Glanz et al., 2002).
- **Perceived Power:** An indirect measure of Perceived Behavioral Control, where individuals assess the impact of each factor in facilitating or inhibiting the behavior of interest (Glanz et al., 2002).
- **Place:** Location and time at which the target audience will perform the desired behavior, acquire any related tangible objects, and receive any related service. Conversely, place may represent the location used to make competing behaviors seem less convenient i.e., reducing accessibility (Kotler, Roberto, & Lee, 2002).
- **Price:** The cost that the target audience associates with adopting the new behavior (Kotler et al., 2002).
- **Product:** The desired behavior and the associated benefits of that behavior or a “complex bundle of benefits” (Kotler et al., 2002).
- **Promotion:** Persuasive communication designed to ensure that the target audience knows about the stated benefits of the price, product, and place. Promotion includes two major components: message and media (Kotler et al., 2002).
- **Referent:** Salient or influential person in the individual’s life (Glanz et al., 2002).
- **Social marketing:** The use of messages intended to influence the target audience to voluntarily accept, reject, modify, or abandon a behavior for the benefit of the individual, the larger group, or society as a whole (Kotler et al., 2002).

- **Social norms marketing:** A mass marketing campaign designed to correct misperceptions regarding the perceived prevalence of a behavior (Perkins, 2003).
- **Subjective Norm:** Belief about whether most people approve or disapprove of the behavior (Glanz et al., 2002).

Summary

This chapter provided the foundation for this investigation including a description of the research problem, purpose of the study, significance, research questions, delimitations, limitations, assumptions, and definition of terms. College student drinking represents a serious public health problem. Every year, college students experience severe alcohol related consequences, including death, sexual assault, fights, unplanned pregnancy, sexually transmitted infections, and poor academic performance. The purpose of this study was to identify which of the TPB constructs to utilize when designing health promotion messages to discourage excessive alcohol use among college students on game day. This research may assist practitioners in reaching their goals of reducing alcohol consumption and the associated consequences on game day.

CHAPTER 2 REVIEW OF THE LITERATURE

The purpose of this study was to determine the efficacy of the Theory of Planned Behavior in predicting alcohol use among college students on game day. The information contained in this chapter provides a review of the research that is relevant to this study. The initial section of this chapter provides an overview of the personal and environmental risk factors associated with 5+4+ drinking and the related health consequences. The next section presents a brief account of research related to game day drinking behavior. Finally, a theoretical description of social norms, social marketing, and the Theory of Planned Behavior will be presented.

While considered a rite of passage by some, drinking in college is more pervasive and destructive than many people recognize. Too often today's headlines bring news of yet another alcohol related tragedy involving a college student, whether it is a drinking and driving accident, homicide, sexual assault, or other misfortune. The traditions and the beliefs concerning alcohol are handed down from one generation to the next, perpetuating the culture of alcohol abuse on college campuses. The issue is not simply that college students drink rather it is the way they drink that places them at high-risk for alcohol related problems (NIAAA, 2006). Drinking games, dares, contests, and high volume drinking are common practices among college students who drink. Research indicates that 5+4+ drinking patterns are most prevalent during the late teens and early-to-mid-twenties (Naimi, Brewer, Mokdad, Denny, Serdula, & Marks, 2003).

Factors Associated with 5+4+ Drinking

Young adulthood represents a stage in life marked by change and self-discovery, especially from those entering a college away from home. Students move out of the homes of their parents and join their peers, and often live in residence halls or in an off-campus

arrangement. In addition to managing course work, many students are employed and begin to form serious relationships. Typically, students explore who they want to be, what they want to do, and how they will fit into the world. Concurrently, parental authority weakens while peer influence increases. For the first time, many college students are free to make their own choices, including the decision to drink alcohol (NIAAA, 2006).

Many people fail to recognize or appreciate these complexities. Indeed, the judgment of a young adult is influenced by a combination of personal and environmental factors. Key personal factors may include past alcohol use, family influences, genetics, and personality (Sher, Trull, Bartholow, & Vieth, 1999; Zucker, Fitzgerald, & Moses, 1995). In fact, a significant percentage of students arrive on campus with previously established drinking patterns.

According to the data from 2005 Youth Risk Behavior Surveillance System (YRBSS), nearly half of high school students (43%) reported consuming one or more drinks of alcohol in the last 30 days, and approximately one-fourth (26%) reported consuming five or more drinks on one or more occasions in the previous 30 days (Center for Disease Control and Prevention [CDC], 2006).

Personal Risk Factors

With regard to family influences, during young adulthood parents' influence on their children's behavior wanes. Nevertheless, the example parents set with their own drinking patterns has been shown to make a lifelong impression on their children. Young people tend to model their own drinking patterns, including quantity, frequency, attitudes, and contexts of use, on the alcohol consumption practices of their parents. Parenting style, attachment, nurturing, bonding, abuse, neglect, conflict, discipline, and monitoring also influence alcohol use of young adults (White, Johnson, & Buyske, 2000). Parents, who do not actively monitor their children's

behavior or do not remain consistently involved in their lives, place their children at increased risk for substance abuse (National Center on Addiction and Substance Abuse at Columbia University, 1999). Even while at college, parental influence on alcohol issues may serve as a protective factor for some students (NIAAA, 2002b).

Behavioral cues are not the only alcohol-related indicators parents pass along to their children. Alcoholism or alcohol problems seem to “run” in certain families (White et al., 2000). This family connection to alcohol abuse may be the result of genetics. However, the social influences of the family must also be considered. Not only might children model their drinking behavior after their parents, they may also emulate an older brother or sister’s drinking behavior. Also complicating the epidemiological trends are older siblings who may provide alcohol to younger siblings, because accessibility also represents a major influence in the decision to use and/or abuse alcohol. Nevertheless, genetics should not be underestimated as a key contributing factor associated with alcohol abuse. Research indicates that people with a family history of alcoholism are less likely to mature out of heavy alcohol use than those with no family history of alcoholism (Jackson, Sher, Gotham, & Wood, 2001).

Personality also plays a major role in 5+4+ drinking and alcohol abuse. Studies document that people who are risk-takers, rebellious, impulsive, or sensation-seeking tend to consume larger amounts of alcohol and drink more often than others (Arnett, 2005). Impulsivity and sensation-seeking behavior are associated with deviant conduct and nonconformity, both of which are linked to heavy drinking and the associated consequences (Baer, 2002). College students as a whole are also more likely to feel invincible. This lack of vulnerability or optimistic bias may also result in increased drinking, because students do not fear or expect negative consequences (Arnett, 2005). Finally, because college can be such a stressful time, some

students drink to cope with negative moods, feelings of depression, or to relieve anxiety (Jackson, Sher, & Park, 2005).

Environmental Risk Factors

A variety of environmental factors influence drinking patterns among college students. Rates of 5+ drinking tend to be highest at colleges and universities with large Greek systems and/or prominent athletic programs, as well as at schools located in the Northeast (Presley, Meilman, & Leichter, 2002). In addition, local communities that tolerate underage drinking and provide only minimal law enforcement efforts reinforce the culture of alcohol use and abuse (Toomey & Wagenaar, 2002). Other key environmental factors include outlet density, alcohol pricing, and promotional practices. Environmental interventions restructure the circumstances that lead to 5+4+ drinking occasions (Dejong, Vince-Whitman, Colthurst, Cretella, Gilbreath, Rosati, & Zweig, 1998). These strategies preclude the need to identify which individuals are most at risk or likely to benefit from a program. Rather than screening individuals, population-based interventions, such as creating new policies or increasing enforcement efforts, are the focus of environmental management strategies. For example, changing the minimum drinking age or drunken driving laws is arguably easier than targeting potential youthful drinkers or drunk drivers individually. Researchers do not necessarily know which young persons' behaviors changed due to the intervention, but they observed overall that drinking patterns and alcohol related fatalities decreased after states raised their minimum drinking age laws (Wagenaar, 1983). Several leading public health experts assert that communities should focus their time and energies on environmental management strategies rather than on traditional individual based education programs (Dejong et al., 1998; Wechsler & Wuethrich, 2002; Toomey & Wagenaar, 2002).

Another method to reduce alcohol access involves restricting the number of outlets that make alcohol available. In 2002 the NIAAA Task Force on College Drinking concluded that restricting outlet density is an effective approach for reducing alcohol-related problems among the general population (Holder et al., 2000; Gruenewald, Ponicki, & Holder, 1993; Gruenewald, Millar, & Roeper, 1996). Its effectiveness with a college population, however, has yet to be determined. Thus the strategy has been categorized as a Tier 2 intervention by the NIAAA, meaning that it may be promising but additional research is needed to determine its efficacy. Yet, Chaloupka and Wechsler (1996) reported that the density of alcohol outlets, especially those near campus, was related to 5+4+ drinking. In a subsequent investigation among eight diverse campuses, Weitzman, Folkman, Folkman, and Wechsler (2002) found that outlet density was associated with heavy drinking, frequent drinking, and drinking-related problems among college students but to varying degrees. For example, males with a long history of 5+4+ drinking are less likely to be affected by outlet density. Environmental management may be most effective for those students whose drinking patterns are less well-established.

The role of low alcohol prices and special promotions or drink specials represents another environmental risk factor for 5+4+ drinking. A number of studies have shown a relationship between the price of alcohol and consumption. Overall, as the price of alcohol decreases, the consumption rates increase (Kuo, Wechsler, Greenberg, & Lee, 2003). College students are more influenced by the cost of alcohol than other demographic groups (Chaloupka & Wechsler, 1996). Research by Gruenewald and colleagues (2006) indicates that the most effective pricing strategy may be to place minimum prices on each type of alcoholic beverage. The most promising price intervention to reduce 5+ drinking appears to be increasing the cost of inexpensive alcohol. People who can afford expensive types of alcohol are probably less

sensitive to incremental price increases (Gruenewald, Ponicki, Holder, & Romelsjö, 2006). Conversely, price-conscious individuals such as college students appear to be the most influenced by such economic policies.

One of the limitations with environmental management strategies involves the difficulties in implementing them. The lobbying efforts of the alcohol industry and others make it difficult to pass legislation at the local and state levels (Mosher, 1999). Elected authorities with a strong pro-business philosophy are often reluctant to implement policy proposals as well. According to Wagenaar and colleagues (2000), policy makers have a disappointing record of passing and implementing policies which are introduced into the legislatures. Even when laws do pass, oftentimes they are weakened due to a series of compromises and/or the various loopholes to avoid them. From a conceptual point of view, environmental interventions represent perhaps the most effective prevention strategies. Nevertheless, because of the limitations listed, it is important to balance policy efforts with complementary prevention initiatives.

Consequences Associated With 5+4+ Drinking

The need for effective alcohol interventions remains a top public health priority to curb the severe consequences caused by 5+4+ drinking. Sexual assault represents one of the most severe outcomes associated with 5+4+ drinking. Research indicates that a woman has between a one in four and a one in five chance of being sexually assaulted while attending college (Fisher, Cullen, & Turner, 2000). Estimates of sexual assault and other related violence vary widely due to definitions, the underreporting of incidents, and the data collection methods used when conducting surveys. Nevertheless, data indicate that alcohol use is involved in at least 50% of all sexual assaults involving college women (Abbey, 2002). According to Presley (1997), after alcohol consumption, males feel more powerful, sexual, and aggressive, leading to intensified

sexual expectations. Additionally, students often blame alcohol use as justification for engaging in inappropriate behaviors (Abbey, 2002). Some feminists and social activists believe that the social climate tends to excuse males for their behaviors when they drink, whereas females are often blamed and victimized for their choices when they consume alcohol (Katz & Kilbourne, 2004). Overall, women who attend colleges with high rates of 5+4+ drinking are at an increased risk of sexual assault (Kuo, Dowdall, Koss, & Wechsler, 2004).

Other alcohol-related violent acts include interpersonal violence, physical assault, homicide, and suicide. Violence includes behaviors that are threatening, hostile, or damaging (NIAAA, 1997). Results from one nationally representative survey of college students indicated that approximately 17% of students experienced some form of alcohol related violence or harassment during the previous year (Langford, 2006). Also, Smith, Branas, and Miller (1999), reported that the perpetrator had been drinking in 37% of assaults and 86% of homicides. In addition, approximately one in four (23%) suicide fatalities are attributable to alcohol. Violence prevention represents a prominent public health issue, given that the second and third leading causes of death for college students are homicide and suicide, respectively (Barrios, Everett, Simon, & Brener, 2000).

Excessive alcohol use may also result in deleterious sexual health and reproductive consequences for college students and others. People who abuse alcohol are more likely to engage in unprotected sex, report having more sex partners, and use intravenous drugs (NIAAA, 2002c). Hingson (2002) estimated that during the past year, 400,000 American college students between the ages of 18 and 24 years participated in unprotected sex after drinking, and 100,000 engaged in sex when intoxicated and unable to consent. The spread of sexually transmitted diseases represents an ongoing public health struggle. The United States exhibits the highest rate

of sexually transmitted diseases in the developed world (National Center on Addiction and Substance Abuse at Columbia University, 1999). Effective alcohol prevention may result in the reduction of unintended pregnancies and sexually transmitted infections, including HIV.

Alcohol use during pregnancy also remains a serious problem, as 13% of women age 18 to 44 years report drinking alcohol at least once during their pregnancy, and 3% reporting 5+4+ drinking (Centers for Disease Control and Prevention, 2002). Maternal alcohol use during pregnancy contributes to a variety of effects on exposed offspring, including hyperactivity, attention problems, learning problems, memory deficits, and problems with social and emotional development. The most severe consequence of maternal drinking during pregnancy involves fetal alcohol syndrome (FAS), which results in a distinctive set of facial anomalies, growth retardation, significant learning problems, and behavioral challenges. Drinking during the preconception period is strongly associated with unintended pregnancies, as well as other adverse maternal and pediatric health outcomes (Naimi, Lipscomb, Brewer, & Gilbert, 2003). No safe level of drinking exists due to the inherent risks associated with alcohol consumption during pregnancy (NIAAA, 2004b).

Several studies have demonstrated that high-risk drinking compromises academic performance. The NIAAA (2002b) estimated that 25% of college students reported academic difficulties caused by alcohol use, such as earning lower grades, doing poorly on tests or papers, and falling behind. According to a 2002 national survey, approximately one-third of students missed a class in the previous year due to alcohol use (Core Institute, 2005). Research also indicates an association between the number of drinks students consume and their academic performance. Presley and colleagues (1997) found that third-year students with an A average consume about four drinks a week, B students consume six drinks a week, C students consume

eight drinks a week, and students who receive Ds or Fs average almost 10 drinks a week. Even more problematic than poor grades, studies suggest that college drinking is a major factor in students dropping out of school (Sullivan & Risler, 2002; Perkins, 2002).

Another alcohol-related issue college students and society endure involves the monetary costs associated with 5+4+ drinking. Researchers estimated that college students spend about 5.5 billion dollars annually on alcohol. Ironically, this amount exceeds the money they spend on books, soda, coffee, and juice combined (Eigan, 1991). Precise estimates on how much 5+4+ drinking costs society do not currently exist. However, a wealth of information exists on the costs of underage drinking. A study released in 2006 indicated that underage drinking costs Americans 62 billion dollars every year. This figure surpasses what the federal government spent on relief for Hurricanes Katrina and Rita combined. Deaths, injuries, and lost work time, car crashes, violent crime, high-risk sex, and addiction treatment compose the vast majority of the expenses associated with underage drinking (Miller, Levy, Spicer, & Taylor, 2006).

Game Day Drinking Behaviors

College football game day represents a unique public health challenge for prevention advocates, university administrators, and city leaders. College football games present not only high-risk drinking situations, but also symbolic events for the university and surrounding community (Glassman et al, 2007). For roughly six home games a year, tens of thousands of fans come to campus and tailgate while open container laws are typically ignored. Perceived and real pressure from alumni, students, and other fans make the game day culture highly resistant to change.

Research indicates that sports fans are less likely to abstain from alcohol and more likely to drink excessively than others (Nelson & Wechsler, 2002). Alcohol consumption is considered

to be a contributing factor in fan/spectator aggression (Coons, Howard-Hamilton, & Waryold, 1995). Riots, stampedes, fights, and fatal beatings caused by rowdy spectators under the influence of alcohol have occurred at alarming rates (National Collegiate Athletic Association, 2003). Inappropriate fan behavior not only diminishes the spectator experience and creates a poor public image but costs institutions and communities thousands of dollars in extra police enforcement, cleanup and restoration expenses. Equally problematic for universities attempting to improve their prevention efforts are the mixed messages that excessive drinking while tailgating (drinking and partying on campus before and after athletic events), sends to students. Finally, the injuries and or fatalities related to game day alcohol consumption place universities at increased risk for litigation.

Although previous studies examined alcohol usage and the associated negative outcomes related to 5+ drinking, little is known about the specific drinking behaviors of college football fans on game day. Neighbors and colleagues (2006) found that 77% of undergraduates consumed alcohol while tailgating and on average had 3.8 drinks. In this study, students underestimated the percentage of tailgaters who consumed alcohol but overestimated how much they drank. Students who overestimated the number of drinks their peers consumed while tailgating tended to be more likely themselves to drink and experience negative alcohol related consequences on game day.

Neal and Fromme (2007) conducted related research for two years by examining the drinking behaviors of freshmen who attended the University of Texas. They implemented a web-based alcohol and drug survey semiannually and tracked students with a 30-day daily self-monitoring instrument at randomly assigned start dates. Relative to non-game day Saturdays, student alcohol use was greater during both home and away games. The authors surmised that

increased alcohol consumption occurred regardless of whether students attended the game. However, the increased drinking resulted only when school was in session, not during holiday or semester breaks (i.e., bowl games). High profile games against national and conference rivals resulted in more drinking than games against less competitive teams. On average, more drinking occurred during away games than home games. The authors speculated that the game itself serves as a protective factor, because students cannot drink while inside the stadium.

In its inaugural year of 2003, Haun and colleagues administered the Game Day Survey on site at the University of Florida campus in Gainesville to 497 participants. Findings revealed that while males drink more alcohol on game day, females suffer more alcohol related consequences associated with college football events. Adverse consequences include experiencing a hangover, vomiting, driving under the influence, blacking out, suffering an injury, fighting, being victimized sexually, or getting into trouble with police. These findings are consistent with national trends which indicate that; overall, females suffer disproportionately high rates of negative consequences related to alcohol consumption (Clarke, 1995; Schafter, 2002; Korcуска & Thombs, 2003). Haun and colleagues (2007) recommended designing specific game day messages targeting women.

The following year Glassman and colleagues administered the revised Game Day Survey. This study included 762 participants who were randomly selected to complete an online survey assessing game day alcohol related behaviors and attitudes. The purpose of the study was to (a) determine if college football fans drink more on game day than they typically do when they party or socialize, and (b) ascertain if drinking status and fan demographics (student vs. non-student) alter support for game day prevention initiatives. Somewhat surprisingly, the results indicated that over half of college football fans surveyed reported that they do not typically drink on game

day. Fans who did drink, reported that they drank significantly more on game day than they did the last time they partied or socialized. Overall, males drank considerably more than females on game day (Glassman et al., 2007).

In addition, the more fans drink the less likely they are to support game day interventions. Nondrinkers were the most supportive of game day interventions followed by moderate drinkers; whereas, heavy drinkers showed the least support. Compared to non-students, students were more supportive of designated tailgating areas where open containers are permitted. Not surprisingly, students were less supportive of increasing underage drinking enforcement efforts than non-students. The authors suggested that significant public support exists for prevention initiatives and that decreasing alcohol consumption on game day is fundamental to reducing the school's 5+ drinking rate during the fall semester. On average there is a home football game once every 2 weeks during the months of August (last 2 weeks of the month) September, October, and November. Thus, game day drinking behaviors of students are likely to be reflected in their responses to the standard 5+ drinking item which asks "During the past 2 weeks did you consume five or more drinks in one sitting?" As a result game day is a mediator for 5+ drinking during the fall semester, but not in the spring when there are no college football games.

Furthermore, Dodd and Glassman (2006) conducted focus groups among UF first year students and found that students described game day drinking as different from "regular drinking," in that game day drinking begins earlier in the day, sometimes as early as 9:00 a.m., and often continues until late at night. Student drinkers described game day as two separate events with drinking occurring before and after the game. Tailgating typically begins on campus parking lots before the game starts. During the game university security and law enforcement officials strictly enforce the no alcohol policy within the stadium (excluding the luxury boxes).

Students who are visibly intoxicated and pose a health threat or are otherwise belligerent are asked to leave the stadium. In addition, anyone who leaves the stadium is not allowed to reenter. After the game some students go to bars or house parties and continue drinking. This level of alcohol consumption appears to be more prevalent during the fall semester; although, game day is not the only ritual in which extreme drinking occurs. Spring break, weddings, holidays and other events foster social environments in which excessive drinking is normalized and often expected.

Social Marketing and Alcohol Use

Given the financial burden and human suffering that alcohol causes, the need for evidence-based, cost-effective alcohol interventions on college campuses is apparent. One way to reach large numbers of people is through the use of social marketing campaigns. While many definitions for social marketing exist, all contain the basic premise that “social marketing employs commercial marketing techniques to influence a target audience to voluntarily accept, reject, modify, or abandon a behavior for the benefit of individuals, groups, or society as a whole” (Kotler, Roberto, & Lee, 2002, p.5). Philip Kotler and Gerald Zaltman first introduced the concept of “social marketing” over 30 years ago when they published: *Social Marketing: An Approach to Planned Social Change* (1971). Since then a growing interest in the use of social marketing concepts, tools, and practices has emerged and the field has evolved from simply designing messages to addressing complex environmental and community issues (Kotler, Roberto, & Lee, 2002).

The Centers for Disease Control and Prevention (2006) encourages programs to apply the principles of social marketing to public health problems to increase the effectiveness of interventions. The primary objective of social marketing is to influence the behavior of select

audience members for the purpose of getting them to voluntarily change, maintain, or prevent behaviors. Social marketing programs do this by offering members of the target audience attractive benefits, and/or by reducing barriers, which might prevent or otherwise discourage them from engaging in the desired behaviors (Glanz, et al., 2002).

Effective social marketing efforts offer products, services, or ideas that members of the target audience perceive to be in their own best interests. Ideally, this is achieved through gaining a thorough understanding of the target population. The “package of benefits” must resonate among the intended audience. Perceived barriers to the desired behavior must be alleviated or lessened, and the alternative behaviors need to provide more compelling benefits (Glanz, et al., 2002). The key is to determine what advantages people see in performing their current behavior. For example, college students may perceive that drinking alcohol will help facilitate dating and romantic relationships. Modifying alcohol expectancies or attitudes represents a fundamental step toward changing social norms (Wall, Hinson, & McKee, 1998). Conversely, it is also necessary to determine what negative effects people may see in their current behavior. Continuing with the example of college student drinking, students may determine that a hangover represents a cost that is so severe that they decide to moderate their drinking or quit all together. Only through extensive formative research can these motivational cues be determined.

Utilizing social marketing strategies to address 5+ drinking among college students is an emerging practice in the field of college health. For example, Brower and colleagues used a social marketing approach at the University of Wisconsin to curb alcohol consumption among students (Brower, Ceglarek, & Crowley, 2001 cited in Glanz, et al., 2002, p. 455). Their needs

assessment indicated that freshmen drank at higher rates than the rest of the student population. Consequently they decided to segment students based on year in school and readiness to change. The researchers targeted 5+4+ drinkers who reported relatively minimal drinking in high school, as opposed to 5+4+ drinkers with a relatively long history of drinking, based upon their belief that the latter group would be less resistant to intervention. Their findings indicated that students engaged in 5+4+ drinking because they perceived that there was nothing else to do. The first year students felt disconnected upon arriving on campus, while at the same time they wanted to assert their newly found independence. As a result, the school developed an attractive series of late night activities and marketed them based on student feedback. Student organizations were promoted through advertisements, which each began with a pun to draw students in and concluded by mentioning that there were over 645 student organizations available to them on campus. These ads did not address alcohol issues, but instead focused on the needs of students to be social and active. While outcome results from this project are not available, process data indicated that as a result of the social marketing campaign more students were taking advantage of non-alcohol activities on campus (Brower, Ceglarek, & Crowley, 2001 cited in Glanz, et al., 2002, p. 59).

Social Norm Campaigns

Perhaps the most common social marketing campaign used across college campuses during the late 90s and the early turn of the millennium were social norms interventions. The social norms approach began in the mid-80s with the research of Wesley Perkins and Alan Berkowitz (Linkenbach, 1999). They, and subsequently other researchers, found that adolescents and young adults quite often overestimated the alcohol consumption rates of their peers (Prentice & Miller, 1993; Graham, Marks, & Hansen, 1991; Hansen & Graham, 1991;

Perkins & Berkowitz, 1986). Students mistakenly believe that their peers consume more alcohol than they actually do. As a result, college students drink more in an attempt to match the norm, albeit a false norm (Haines, 1998; Prentice & Miller, 1993). According to Linkenbach (1999), students are more concerned with what they perceive as normative, than with what they discern as healthy.

In the late eighties health educators at Northern Illinois University (NIU) developed and implemented a social norm marketing campaign designed to curb alcohol abuse among students attending the university. NIU, students mistakenly believed that 70% of the population engaged in 5+ drinking, yet at the time of the assessment, 43% of the students took part in this behavior (Carson, 1995). A campus-wide media campaign was implemented which exposed students to the following fact: “Most NIU students drink zero to five drinks when they party” (Haines, 1998). Classified advertisements, a weekly column, posters, and leaflets were used to communicate the true norm (Haines, 1998). Five years after the onset of the social norms marketing intervention, the perceived 5+ drinking rate had fallen and the actual 5+ drinking rate had been reduced to 28% (Carson, 1995). Over a nine-year period, Northern Illinois University reported a 44% reduction in their 5+ drinking rate (Haines, 1998). Not surprisingly, the negative consequences associated with heavy drinking fell as well. For example, there was a 31% reduction in reported alcohol-related injuries to the individual and a 54% reduction of alcohol-related injuries to others (Linkenbach, 1999).

A major limitation of this research project involved the non-experimental methods used to conduct the evaluation (Haines & Spear, 1996). Rather than randomly selecting participants, surveys were disseminated through undergraduate general education classes, which were reflective of the overall NIU undergraduate population. The response rate for the questionnaire

averaged 89% over a 5-year period. In any given year at least 600 students participated in the survey in a school that usually enrolls about 23,000 students (Haines & Spear, 1996). In addition, no control groups were used for this study, consequently any change in the drinking rates may be the result of external influences.

Other college institutions have benefited from this type of social norms marketing campaign. The University of Arizona also placed ads in the school newspaper, stating, “64% of U of Arizona Students have four or fewer drinks when they party.” According to Linkenbach (1999), as a result of the social norming marketing campaign, the University of Arizona’s 5+ drinking rate fell 29% in 3 years. Hobart and William Smith Colleges reported a 12% reduction in 5+ drinking over 2 years and Western Washington University had an 8% decrease in the 5+ drinking rate over a 1-year period using similar social norms marketing strategies (Haines, 1998). During the summer of 2001, all 23 campuses in the California State University System initiated social norms campaigns (Frauenfelder, 2001).

While social norm campaigns have been used widely, empirical data supporting social norms interventions have been lacking. Werch and colleagues (2000) conducted a randomized control study on social norms interventions and found no differences between the intervention and control groups on any alcohol use or risk measures. Several years later, a national assessment of social norms interventions revealed that almost half of the schools surveyed employed a social norms intervention, yet no decreases were found on the seven alcohol measures for the study (Wechsler, Nelson, Lee, Seibring, Lewis, & Keeling, 2003). In fact, there were increases in two of the five measures: alcohol use in the previous month and consumption of 20 or more drinks in the previous month. In addition, schools which implemented social norms interventions reported some increases in lower level drinking, a result anticipated by the

original theorists, Perkins and Berkowitz. Social norm proponents maintain that practitioners do not truly understand social norms theory and, as a result, they compromise fidelity when implementing this type of intervention. Conversely, opponents suggest that any documented success claimed by researchers is riddled with methodological flaws.

Research by Campo and colleagues (2003) suggested that drinking behavior relates positively to perceptions of friends' drinking as indicated by the Theory of Planned Behavior. In contrast to what social norms theory predicts, they found that drinking behavior is not related to the perception of a typical drinking behavior of students. Male and female students in this study were more influenced by the perception of a male friend's drinking than by a female friend's drinking. This finding might help explain why there has been a rapid increase in drinking among teenage girls, perhaps teenage girls are trying to keep pace with their male friends. In their recommendations for future research, Campo and colleagues suggested emphasizing other types of normative behavior, such as pacing, monitoring blood alcohol content, and other common harm reduction practices. They also suggested when utilizing the Theory of Planned Behavior to focus on the social network of students rather than inferring social comparisons to the student body at large.

Theory of Reasoned Action (TRA) and Theory of Planned Behavior (TPB)

The Theory of Reasoned Action (TRA) and its extension, the Theory of Planned Behavior, involve the relations between beliefs, attitudes, intentions, and behavior (Ajzen & Fishbein, 1980). The major assumption of the TRA is that attitude (Attitude Toward the Behavior) and perceived acceptance of a behavior (Subjective Norm) influence a person's intention (Behavioral Intention). Behavioral Intention in turn, influences a person's decision to perform (or refrain from) the behavior of interest. Ajzen and colleagues (1991) later expanded

the theory by adding Perceived Behavioral Control as an additional construct. This enhancement allowed researchers to examine behaviors that are not totally volitional by taking into account factors such as resources and opportunities (Kutner, 2002). The various TRA/TPB constructs will be explained in the following sections.

According to TRA, the construct Attitude Toward the Behavior represents an individual's beliefs about the behavior coupled with the weighted evaluations of those outcomes. Thus, people who believe drinking alcohol will make them more social, and also value being social, are more likely to have favorable attitudes toward alcohol. Conversely, people who believe that alcohol makes them feel sick and who value their health are more likely to have unfavorable attitudes toward alcohol. Obviously, the more favorable attitudes toward the behavior, the more likely people are to engage in the behavior. The two fundamental indirect measures (sub-scales which link related concepts to the direct measures) which comprise Attitude Toward the Behavior (ATB) include Behavioral Beliefs and Evaluation of Behavioral Outcomes. Behavioral Beliefs consist of a person's attitude towards performing a behavior; whereas, Evaluation of Behavioral Outcomes concerns the relative importance or assessment of engaging in the behavior of interest.

The Subjective Norm represents a person's beliefs about whether most referents approve or disapprove of their behavior, and how motivated they are to comply with what these key referents think. A referent represents an influential person such as a family member, best friend, or spouse. Most young adults tend to be motivated by the opinions of their close peers. Inherent in the Subjective Norm are the two constructs (indirect measures), Normative Beliefs and Motivation to Comply. Normative Beliefs include whether specific referents approve or disapprove of the behavior, whereas Motivation to Comply involves whether the individual cares

what the specific referent thinks. For example, a male college student may perceive that his best friend approves of his drinking heavily and may be very motivated to comply with this belief. However, this same student may have a girlfriend who disapproves of his drinking heavily, but he may not be motivated by this referent. The Subjective Norm concerns peoples' overall assessments of their key referents approval of the behavior of interest and their Motivation to Comply with these referents.

Finally, the most important determinant of behavior is Behavioral Intention, a person's likelihood of performing the behavior. In general Behavioral Intention characterizes an individual's plan or probability of performing a behavior. Attitude, norms, and perceived control over the behavior each shape Behavioral Intention. The amount of influence each of these constructs has on Behavioral Intention differs among various populations and behaviors.

Behavioral Beliefs and Evaluation of Behavioral Outcomes are typically assessed by using bipolar scales scored -3 to +3 (Montano, Kasprzyk, & Taplin, 1997). The outcome values from this calculation are called indirect attitudes (Albarracin, Johnson, Fishbein, & Muellerleile, 2001). Ajzen (2002) proposed an alternate way to measure a person's attitude toward a behavior. In essence, people need to determine their overall evaluation of performing a specific behavior. For example,

For me to cut back on my drinking is:

Bad	-3	-2	-1	0	1	2	3	Good
	extremely	quite	slightly	neutral	slightly	quite	extremely	

A score of "3" indicates that the respondent believes that cutting back on drinking is extremely good, and therefore has a positive attitude toward cutting back on drinking. The more positive the attitude is to the behavior the stronger the intention to perform the behavior. The Subjective

Norm can also be measured using a semantic differential scale (Ajzen, 2002). If people believe that their key referents would approve of them engaging in a certain behavior the higher the score and the greater their Behavioral Intention. Strong Behavioral Intention increases the likelihood of carrying out the behavior.

The constructs that make up Perceived Behavior Control (PBC) include Control Beliefs and Perceived Power (both indirect measures). Control Belief is the assessment one makes about the presence or absence of facilitators and barriers to performing the behavior. Perceived Power is the evaluation of each condition making the behavior more or less difficult. Both constructs are typically scored -3 to +3 or 1 to 7. The construct of PBC is the overall assessment of one's power or control to perform or discontinue the behavior. According to Bandura (1977), the PBC construct is analogous to self-efficacy's contribution to the Social Cognitive Theory. Studies, however, indicate that PBC inadequately predicts behavior. A meta-analysis revealed that only one study demonstrated a significant relationship between intention and PBC (Ajzen, 1991). Controlling for intention further weakened the statistical support for this construct (Reinecke, Schmidt, & Ajzen, 1996). Figure 2-1 illustrates TPB constructs, including direct and indirect measures.

A critical step in utilizing the TRA/TPB theory is to conduct an elicitation study to create a pool of items for the instrument (Montano, Kasprzyk, & Taplin, 1997). An elicitation interview should be conducted with at least 15 to 20 people. The sample should include both those people who intend to perform the behavior and those who do not. The TRA constructs necessitate asking respondents to describe positive and/or negative attributes or outcomes of performing the behavior. Participants should also be asked to describe any individuals or groups to whom they might listen, who are either in favor of or opposed to their performing the

behavior. This information subsequently provides the theoretical foundation for the interventions and survey item development. A variety of approaches exist to develop questionnaires, including personal interviews (Michels & Kugler, 1998), focus groups (Jennings-Dozier, 1999), and open-ended surveys (Bosompra, 2001). Some instruments are simply based on a related literature review or suggestions provided by Fishbein and Ajzen (Goksen, 2002).

While researchers continue to successfully use the TRA, and its extension the TPB, in a variety of applications since the theory was first introduced by Fishbein in 1967, according to Glanz, Rimer, & Lewis (2002) the theory has not escaped criticism. Goksen (2002) pointed out that the Subjective Norm construct may be too complicated to measure using one dimension. In addition, the construct of Behavioral Intention could be removed from the theory altogether to make the theory more parsimonious. Conversely, in an attempt to make the theory more explanatory, researchers have suggested adding a variety of constructs to the theory, such as moral norms, self-identity, temporal stability, and past behavior (Conner & Armitage, 1998; Sheeran & Abraham, 2003).

Nevertheless, this theory provides a framework for identifying key behavioral and Normative Beliefs affecting behavior. The use of this information can contribute to message development designed to target and change identified beliefs or values, ultimately leading to a change in behavior. TRA/TPB assume that underlying reasons determine peoples' motivation for performing a behavior. These reasons ultimately influence peoples' Attitude Toward the Behavior and Subjective Norm, regardless of whether these beliefs are rational, logical, or correct (Glanz, et al., 2002). This framework was used to analyze what motivates students to engage in 5+4+ drinking and what can motivate them to alter this behavior.

Theory of Planned Behavior and Alcohol Use

In a cross-sectional study, Wall, Hinson, and McKee (1998) used the Theory of Planned Behavior to predict alcohol consumption among undergraduate students of legal drinking age at the University of Western Ontario. Consistent with Schlegel's research (1992), they found that the Theory of Planned Behavior was superior to the Theory of Reasoned Action in predicting problem drinking. Attitudes (good/bad, wise/foolish, pleasant/unpleasant, favorable/unfavorable) emerged as the strongest predictor of the intentions of undergraduates to drink "too much" (R^2 males = 0.34 and R^2 females = 0.34). In general the more favorable the attitudes of the participants, the more likely their intentions to drink increased. The Subjective Norm was less predictive. The intentions of females to drink in excess did not appear to be influenced by the Subjective Norm at all, and the construct only accounted for 1.6% of the variance among the male population. The R^2 increased by 4% and 17.3% for males and females, respectively when the Perceived Behavioral Control construct was added to the model.

The work of Wall and colleagues (1998) raised several issues. When assessing the Subjective Norm, participants were asked to rate the likelihood that four specific sets of people expect them to drink "too much" (1 unlikely to 5 likely). These groups included most societal relationships: family, friends, and boyfriend/girlfriend. The category "most people in society" does not match well with the strict definition of a referent, who is someone influential. In addition, most college students are less influenced by their family members than they were formerly. The reliability measure was so low for this scale that the researchers had to deviate from their original methods. Instead, they decided to assess the Subjective Norm with a single item which measured the motivation of participants to comply with perceived general societal pressure to engage in excessive consumption. Again, this measure is inconsistent with the

fundamental underpinnings of the Subjective Norm and influential referents. This study may have produced more valid results if the Subjective Norm were measured using the following sets of individuals: best friend, significant other and close friends. Finally, the survey asked participants if their “referents” expect them to drink “too much.” Since the Subjective Norm construct is not about expectations per se, the question should have focused on what participants perceive referents would think about them engaging in the behavior of interest. A better item, found on the Core Alcohol and Drug Survey Long Form, asks participants the extent to which their close friends would disapprove of their having five or more drinks in one setting. The responses included “do not disapprove,” “disapprove,” and “strongly disapprove.” While these responses may be somewhat biased and limited, they appeared to be much more appropriate than those used by Wall and colleagues (1998).

Conversely, in a series of three studies with undergraduates Trafimow (1996), found that Attitudes Toward the Behavior were better predictors of drinking Intentions than Subjective Norms or Perceived Behavioral Control. He suggested that it is not necessary to spend time and resources measuring actual behavior, because intentions do such an effective job of predicting behaviors. Moreover, he stressed the importance of focusing on the type of drinking measure utilized. In his study, participants were asked to indicate their attitudes, norms and intentions toward (a) avoiding drinking, (b) drinking enough to get a “slight buzz” (a term used by the authors), or (c) drinking enough to get drunk. This study did not adequately identify 5+4+ drinkers. A “slight buzz” for a heavy drinker may involve enough alcohol to get a moderate drinker intoxicated. Specific comparisons between drinking intensity among the various participants were lacking. Trafimow’s findings concurred with those of Budd and Spencer (1984) as well as his earlier research (Trafimow & Finlay, 1996). He concluded that Subjective

Norms and Perceived Behavioral Control were relatively unimportant predictors of drinking among undergraduate students' intentions to get drunk.

Other research concerning college students and alcohol use also indicated that TPB did not significantly add predictive powers above and beyond the TRA (O'Callaghan, Chant, Callan, & Baglioni, 1997). O'Callaghan and colleagues speculated that because most respondents were non-problem drinkers they experienced high perceived self-control over their drinking. Too few problem drinkers with low Perceived Behavioral Control were in the study for the construct to elicit significant influence. One limitation of the O'Callaghan study was the authors focused on intentions to drink alcohol rather than intentions to get drunk. However, this study did reveal a significant link between past behavior and intentions. The researchers suggested that alcohol consumption may be a mindless or unthinking process for some college students. Thus, drinking may not be motivated by attitudes, but merely by having consumed alcohol on previous occasions ("habit" effect). O'Callaghan and colleagues believed that more accurate measures of attitude are needed to identify its role in behavior prediction over and above the influence of past behavior. Indeed, prior research indicated that attitudes may be generated from past behavior (Fazio & Zanna, 1981).

While O'Callaghan and colleagues found the construct PBC to be negligible in predicting drinking patterns among college students, Norman, Bennett, and Lewis (1998) reported just the opposite. In a study conducted at a Welsh University, 136 undergraduates were asked about their drinking behaviors as they relate to the TPB. However, the definition of heavy episodic drinking used in this study was quite different from the version used in studies with U.S. students. In Wales, the heavy episodic drinking criterion for males was 10 drinks in a single session, seven for females, within the previous week.

Norman and colleagues (1998) created a series of indirect measures for each construct as outlined in the TPB. Positive and negative Behavioral Beliefs, Normative Beliefs, and Control Beliefs were utilized. The regression analysis revealed that gender explained nine percent of the variance. Together, the variables under consideration explained 38% of the variance in the frequency of heavy episodic drinking. Only Perceived Behavioral Control and positive Control Beliefs were significant independent predictors.

The most recent study found on TPB and college student drinking was conducted by Johnston and White (2004). The sample for this study included 139 first-year female undergraduate students enrolled in an introductory psychology class at a large Australian university. The authors conducted an elicitation study to develop the indirect measures for each of the TPB constructs. The aim of the study was to examine the range of beliefs that differentiated 5+4+ drinkers from non-5+4+ drinkers. More specifically, the researchers assessed the beliefs of 5+4+ drinking as they related to perceived costs and benefits, beliefs concerning controllability, and beliefs about how others influenced an individual's decision to drink. Multiple logistic regression analyses were utilized to determine which of the indirect measures best predicted 5+4+ drinking.

The results indicated only three statistically significant measures predicted 5+4+ drinking, including *beliefs* about the costs associated with 5+4+ drinking (having a hangover/feeling sick, damaging health, behaving embarrassingly), Evaluation of the Benefits of drinking (relaxing/unwinding, having fun/socializing, reducing inhibitions), and Normative Beliefs (how key referents think about engaging in 5+4+ drinking). They concluded that messages targeting college women should downplay the perceived benefits of 5+4+ drinking and should highlight the perceived costs. Findings from this study indicated that women who

engaged in 5+4+ drinking believed that their key referents approved of their consuming four or more drinks. Finally, the effect of control factors revealed no significant differences between 5+4+ and non-5+4+ drinkers.

Overall, these studies indicated that the TPB represents an appropriate model for examining drinking patterns among college students. However, the literature contains mixed reports on the extent to which Perceived Behavioral Control influences 5+4+ drinking behavior among college students. There are also discrepancies concerning whether Attitude Toward the Behavior or Subjective Norm represents the most powerful construct in predicting Behavioral Intention with this population and behavior. Different questionnaires, items, and methods produce disparate results even among the same constructs, behavior, and population group. Table 2-1 summarizes key findings from the published studies and denotes which constructs were significant in predicting 5+4+ drinking among college students. Additional research needs to be conducted in this area.

Alcohol Consumption Measures

A great deal of debate exists on how best to measure “high-risk” drinking as well as how to label this behavior. For example, the use of the term “binge” drinking concerns some university officials, prevention specialists, and substance abuse professionals. Inconsistent meaning and definition of the term yields different implications. Clinicians dealing with addiction define “binge” as a multiple day “bender” (NIAAA Newsletter, 2004a), whereas Wechsler and Nelson (2001) described a “binge” as consuming five or more drinks in one sitting within the previous two weeks. Wechsler and Nelson (2001) concluded that risk for alcohol related consequences increases significantly after men consume five or more drinks (four or more drinks for a female) and state that the term “binge” is justified based on such scientific

evidence. Some professionals believe the use of the expression “binge” exaggerates or distorts the problem. The use of this expression may also contribute to the misperception that “everyone is drinking heavily,” thereby perpetuating a false norm (Perkins, 2003).

The media continue to use the term “binge” in newspaper headlines across the country (Vicary & Karshin, 2002). However the editors of the *Journal of Studies on Alcohol*, discourage the use of this term in their journal (Thombs, Olds, & Snyder, 2003). The professional consensus to describe this behavior includes the use of terms like “high-risk” or “heavy episodic.” All of these terms, including “binge,” utilize essentially the same 5+/4+ drinks measurement criteria (four or more drinks in one sitting for females within the previous 2 weeks, five or more drinks for males) (Higher Education Center for Alcohol & Other Drug Abuse and Violence Prevention, 2000).

Other researchers are concerned that the conventional 5+/4+ drinks measurement criterion fails to identify episodes of intoxication accurately. Thombs and colleagues (2003) used breathalyzers to measure BAC (Blood Alcohol Concentration) levels in college students returning to their residence halls after socializing on Wednesday, Thursday, Friday, and Saturday nights. In most instances they found that those students who reported having 5+/4+ drinks did not have BAC’s above the legal limit. This finding is consistent with Lange and Voas’ (2001) research, in which they found that the 4+/5+ measure predicted relatively low BAC rates among young adults crossing the U.S. border at Tijuana, Mexico. Because the 4+/5+ measure fails to include body weight and time parameters, the measure provides high sensitivity but little information about the degree of intoxication (Thombs et al., 2003).

Researchers and governmental organizations continue to work toward a more accurate measurement of problematic drinking. The NIAAA (2004a) National Advisory Council attempted to clarify the issue by defining a binge as:

a pattern of drinking alcohol that brings blood alcohol concentration (BAC) to 0.08 gram percent or above. For the typical adult, this pattern corresponds to consuming 5 or more drinks (male) or 4 or more drinks (female) in about 2 hours.

One limitation to this definition is that it may be difficult for people to recall accurately the amount of time in which they consumed a certain quantity of alcoholic drinks.

White, Kraus, and Swartzwelder (2006) contend that while the 5+/4+ measure is helpful in identifying high-risk drinking, it fails to capture data regarding how heavily people actually drink. To remedy this issue they measured not only the standard binge drinking rate (5+/4+), but also assessed double (10+/8+) and triple (15+/12+) the binge drinking thresholds using a national sample of college students. They found that nearly one-fifth of males consumed 10+ drinks at least once during the previous 2 weeks. Further, roughly half of all males categorized as binge drinkers regularly drank at twice the binge drinking threshold. Clearly, the probability of experiencing catastrophic consequences increases substantially when drinking occurs at these very high levels.

Drinking at these high levels is thought to be precipitated by events which are culturally associated with heavy drinking, such as New Years Eve, St. Patrick's Day, Spring Break, 21st Birthday, Cinco de Mayo, weddings, and game day among others. These ritualistic events represent unique circumstances for consuming alcohol, occasions where overindulgence seems more acceptable and even expected. Listiak (as cited in Voas, Furr-Holden, Laurer, Bright, Johnson, & Miller, 2006) referred to this phenomenon as a "time out" period, in which social control is relaxed and deviant acts are legitimized by an attitude of tolerance, a time out from the status quo. Time out events are associated with heavy drinking, illegal drinking, fighting, sexual

activity, and overall impulsive behavior (Voas, et al., 2006). There is little research about the drinking patterns associated with context-specific ritualistic events (Neighbors et al., 2006). Yet law enforcement efforts increase substantially for these major events, suggesting that there is a need for intervention. Given the increased number of hours spent drinking and the number of drinks consumed at these events, a specific instrument that can measure the unusually high rates of alcohol consumption at these events appears warranted.

Summary

Alcohol abuse among college students represents one of the most prominent health issues for colleges and universities. Despite increased attention and resources directed toward this issue there has been very little improvement over the last decade either nationally or locally. An abundance of published research exists analyzing the health risks associated with alcohol use. While no clear formula for determining the confluence of factors that cause 5+4+ drinking, the presence of multiple risk factors such as personality, family, genetics, and environmental influences increases the probability of persons experiencing negative consequences due to excessive alcohol consumption.

A particular area of concern regarding 5+4+ drinking on college campuses involves college football games, also known as “Game Day.” Alcohol consumption is considered to be a contributing factor in fan/spectator aggression. Riots, stampedes, fights, and fatal beatings caused by rowdy spectators under the influence of alcohol warrant intervention. In general, game day represents a ritualistic event where overindulgence seems more acceptable and even expected. This phenomenon — sometimes referred to as a time-out period — can be characterized by lax social control and deviant acts which are legitimized by an attitude of

tolerance. Additional research is needed to better understand how to prevent or minimize this extreme and ritualistic context-specific drinking behavior.

Social marketing constitutes a cost-effective method for reaching large numbers of people. Changing the social norms and mores concerning alcohol represents a fundamental step toward modifying the social environment. Utilizing the Theory of Planned Behavior as a framework for developing effective social marketing messages shows promise. However, its overall applicability to college student 5+4+ drinking remains in question, given the mixed results present in the literature. In addition, the issue of how most effectively to assess and label high volume drinking further complicates alcohol research.

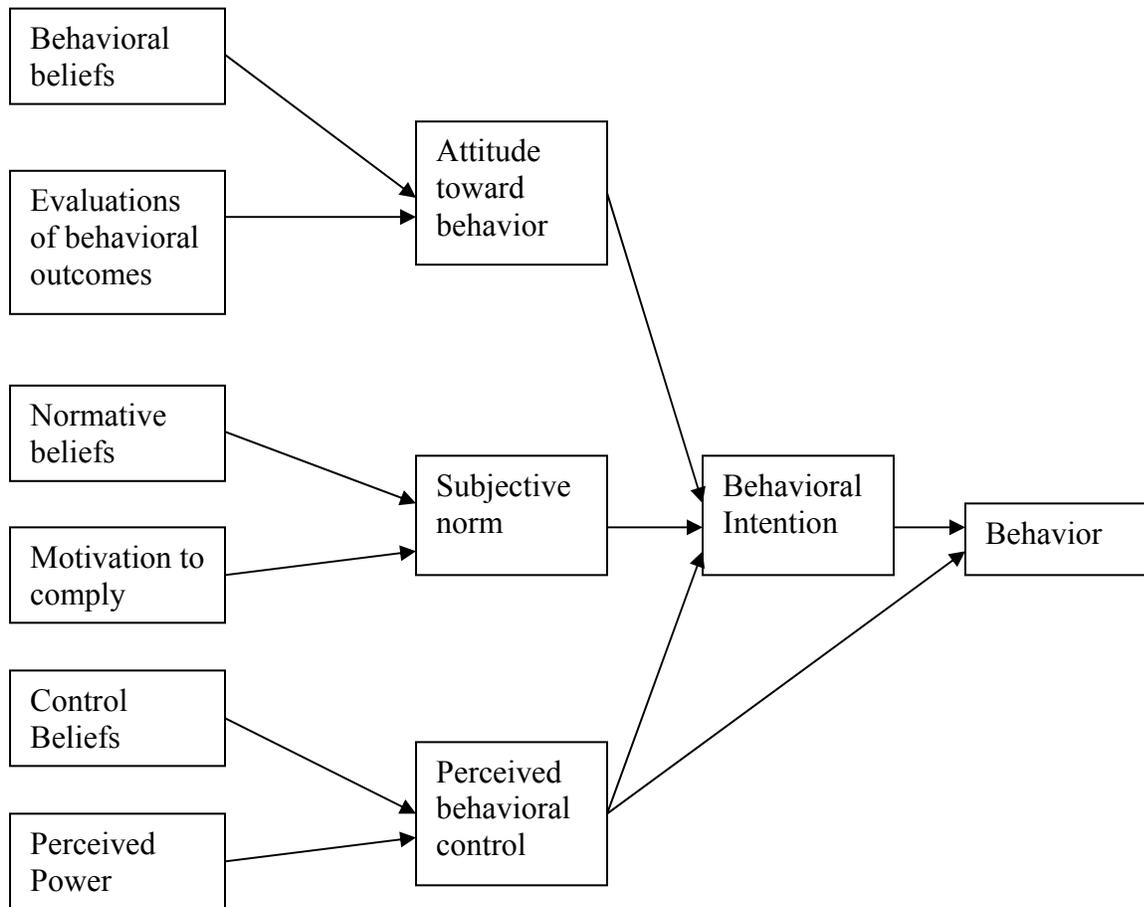


Figure 2-1. Theory of Planned Behavior Constructs

Table 2-1. Summary of the TPB Alcohol Related Articles

Author	Year published	Attitude	Subjective Norm	Perceived Behavioral Control
Johnston & White	2004	X	X ^{*†}	
Norman, et al.	1998			X ^{*◇}
Wall, et al.	1998	X [*]		X
O'Callaghan, et al.	1997	X	X [*]	
Trafimow	1996	X [*]		
Schlegel	1992	X [*]		X
Budd & Spencer	1984	X [*]	X	

Note:

X = statistically significant predictor

* = construct served as the strongest predictor

† = indirect measure Normative Belief

◇ = indirect measure Control Belief

CHAPTER 3 METHODS

This chapter provides information on the data collection methods employed for this study. The purpose of this investigation was to determine the Theory of Planned Behavior's (TPB) efficacy in predicting Extreme Ritualistic Alcohol Consumption (ERAC) within a population of undergraduates at a large university on "game day." ERAC is defined as consuming 10 or more drinks on game day for a male and eight or more drinks for a female on game day. Gender and grade classification variables were also analyzed to determine their respective influence on the TPB constructs as they relate to ERAC. This chapter includes a description of the research design, research variables, study population, instrumentation, participants, item development, data collection procedures, and data analysis methods.

Research Design

A cross-sectional survey design with randomly selected participants was utilized to answer the research questions proposed for this investigation. Cross-sectional surveys are often used in social science research to provide a single point in time examination of the sample population (Dooley, 2001). However, several disadvantages exist when using cross-sectional study design including: it only includes those people who completed the questionnaire, it may represent only those who have the disease or engage in the behavior, and it may not be effective if the disease or behavior is rare (Timmreck, 1994). Very importantly, a cross-sectional design does not allow for analyzing cause and effect relationships. Causal relationships can only be established by using experimental design (Cottrell & McKenzie, 2005).

Nonresponse bias is another important issue to consider when implementing a cross-sectional design (Timmreck, 1994,). Nonresponse bias accounts for differences between those participants who complete the study and those who do not. If selected participants *randomly*

complete or fail to complete the survey, the response bias is negligible. The decision by participants to complete the survey depends on their characteristics, attitudes, opinions, and interests with regard to the research agenda. Consequently, some classes of individuals are likely to be over, or under-represented, and therefore may bias the research findings (Alreck & Settle, 1995).

General principles can be employed to estimate the degree of non-response bias. Those who are typically interested or involved with the topic are much more likely to participate in a survey than those who are not. This includes individuals who have strong feelings about the issue, whether they are negative or positive. Overall, participants who feel apathy or who are inexperienced with the topic tend to be less likely to complete the survey. In addition, persons who are very busy are less likely to respond to a survey than are people with fewer time constraints. Generally, researchers should estimate the degree to which non-respondents will affect the results of the survey. It is recommended that in cases in which nonresponse is likely to be significant, researchers should consider collecting the data in another manner, such as via personal interviews (Alreck & Settle, 1995).

Using cross-sectional design provides some inherent advantages when compared to other research methods. It is less expensive and more expedient to conduct cross-sectional research, because data are collected once rather than multiple times. In addition, cross-sectional research supplies useful information for designing interventions (Friis & Sellers, 1996), provides a means of exploring the interrelatedness of attributes of disease or conditions within a group, and is based on a sample of a population, not on individuals who present themselves for medical treatment or policy violations. When compared to longitudinal studies, cross-sectional data often yield similar results (Timmreck, 1994).

Given the advantages of cross-sectional research and limited resources for this investigation, the Game Day Survey was administered at a single point in time. These methods were consistent with Game Day Survey data collection procedures implemented by the University of Florida Student Health Care Center for the past three years. This enables University officials to compare key indicators over time. The results from prior Game Day Survey analyses reveal that approximately a third of the sample participated in the survey (Glassman et al., 2007), and similar response rates were expected in the this investigation. In addition, participant demographics were matched to the overall student population to assess response bias. Although, personal interviews represent an informative method for obtaining information on alcohol issues with college students (Dodd & Glassman, 2006) this strategy was not feasible due to the limited resources available for this investigation.

Research Variables

In this study multiple observatory variables from the Theory of Planned Behavior (TPB) as they relate to extreme ritualistic alcohol consumption were examined. These included Subjective Norm, Attitude Toward the Behavior, Perceived Behavioral Control, and their corresponding indirect measures, Behavioral Beliefs, Evaluation of Behavioral Outcomes, Normative Beliefs, Motivation to Comply, Control Beliefs, and Perceived Power.

A description of how the TPB constructs for the Game Day Survey were created and how each measure was assessed is requisite to understanding the research design. The format for constructing the Game Day Survey items was modeled after the method developed by Ajzen and Fishbein (1980). The theory suggests that a person's feelings, perceived acceptance, and control determine a person's intention to engage in a behavior. Subsequently, the individual's intention predicts whether the person performs the behavior. The direct measures (Attitude Toward the

Behavior, Subjective Norm, and Perceived Behavioral Control) are typically more strongly associated with intention and behavior than are the indirect measures. However, the indirect measures (Behavioral Belief, Evaluation of Behavioral Outcomes, Normative Beliefs, Motivation to Comply, Control Beliefs, and Perceived Power) may be more beneficial in helping researchers and practitioners develop interventions because the information is more specific in terms of what motivates behavior (Glanz, et al., 2002). Note: Tables 3-1, 3-2, and 3-3 provide the items related to the underlying TPB constructs.

Attitude Toward the Behavior

Attitudes about inebriation on game day were assessed using six different seven-point semantic differential scales (good/bad, beneficial/ harmful, enjoyable/unenjoyable, healthy/unhealthy, favorable/unfavorable, and wise/foolish; direct measure, Table 3-1). See Appendix A for the survey instrument.

Behavioral Beliefs

Behavioral Beliefs items were measured by asking participants their beliefs concerning game day drinking (indirect measure, Table 3-1). For example, participants indicated the likelihood that “I would have more fun if I got drunk on game day.”

Evaluation of Behavioral Outcomes

Evaluation of Behavioral Outcomes (indirect measure, Table 3-1) items were measured by asking participants the value they attach to game day drinking. For example, participants indicated their level of agreement that “Having fun on game day is important to me.”

Subjective Norm

Subjective Norm (direct measure, Table 3-2) was measured by asking participants to rate the extent to which individuals, whom they value, would approve or disapprove of their drinking

alcohol to the point of intoxication on game day (home football game). For example, participants were asked the extent to which they agreed with the following statement: “Most people I hang out with get drunk on game day.”

Normative Beliefs

Behavioral Belief (indirect measure, Table 3-2) items were measured by asking participants if specific key referents would approve of their alcohol use on game day. For example, participants indicated their level of agreement that “My best friend would approve of me getting drunk on game day.”

Motivation to Comply

Motivation to Comply items (indirect measure, Table 3-2) were measured by asking participants how motivated they were to meet the expectations of specific key referents. For example, participants indicated their level of motivation to comply by answering the following question. “When it comes to drinking alcohol, how motivated are you to meet the expectations of your best friend?”

Perceived Behavioral Control

Perceived Behavioral Control (direct measure, Table 3-3) items were measured by asking participants to indicate their level of agreement concerning personal drinking behavior. For example, participants responded to statements such as “I am confident that I can limit my alcohol consumption on game day.”

Control Beliefs

Control Beliefs (indirect measure, Table 3-3) measured the perceived opportunities and barriers of participants concerning alcohol consumption on game day. For example, participants indicated how often they “Use a designated driver or safe transportation on game day?”

Perceived Power

Perceived Power items (direct measure, Table 3-3) assessed the likelihood that opportunities and barriers would influence the alcohol consumption of participants on game day. For example, they indicated the extent to which “Having a designated driver or safe transportation influences my decision to get drunk on game day?”

Behavioral Intention

Finally, participants were asked to disclose their level of intention to drink alcohol on Game Day. For example, they rated their agreement with the statement “I intend to get drunk at the next Gator home football game I attend.”

Behavior

The alcohol consumption questions were measured by asking students how many alcoholic beverages they typically consume on game day. Recall bias represents an important limitation when designing an item which asks participants to summarize their drinking over an extended time period (Dawson, 2003). The college football season starts in early August and ends in late November, a span of 4 months. Asking participants to think back over that time period and determine what is typical may be problematic for some individuals. Nevertheless, it is not uncommon to find items on alcohol-related surveys which ask participants to report their usual drinking behavior over the previous year. For example, Dawson (2003) used the following item to measure this outcome: “On the days when you drank beer in the last 12 months, about how many (cans/bottles/glasses) did you USUALLY drink in a single occasion?”

The Game Day Survey also included an *exact recall* item which asked participants to report the total number of alcoholic drinks they consumed before, during, and after the final Gator home football game of the 2006 season (University of Florida versus Western Carolina

University (WCU) November 18, 2006). Since the survey was distributed on November 20, 2006 this item minimized recall bias because it reduced the time period between the behavior and the data collection. It is much easier for participants to reflect back on the most recent Gator home football game than it is for them to synthesize their typical or average home football game experience over the course of the entire season.

There are other variables to consider regarding home college football games as well. These include the time of day the game is played and the weather. Thus, exact recall questions are limited in that they may represent an atypical scenario which is not reflective of the usual drinking patterns of participants. In addition, exact recall questions may not capture the consequences associated with certain behaviors because they occur infrequently (Dawson, 2003). For example, the probability of a participant vomiting as a result of their alcohol consumption over the course of an entire football season is much more likely than vomiting after one particular home game.

The item asking for the number of alcohol drinks typically consumed on game day was included in an attempt to be consistent with other standardized alcohol measures. The AUDIT [Alcohol Use Disorders Identification Test] (Babor, Higgins-Biddle, Saunders, & Monteiro, 2001), BASICS [Brief Alcohol Screening Instrument College Students] (Dimeff, Baer, Kivlahan, & Marlatt, 1999) and the first article written on game day drinking (Neighbors et al., 2006), all use the word “typical” when asking the respondents to summarize their drinking behavior. In addition, utilizing this item format matches the three previous Game Day Surveys implemented at this university, allowing comparisons over time and reducing the need for recurrent assessment of reliability (Dawson, 1998).

One way to increase reliability and validity on items involving alcohol is to include questions on the drinking context (Dawson, 1998). The Game Day Survey has two items which specifically included contextual cues. One of these asked participants to identify where they drink before, during, and after the game. Another question asked participants to report the total number of alcoholic drinks they consumed during the two hours before the game, during the game itself, and the two hours after the game. This measure is consistent with NIAAA's (2004a) recommendation that a time period be designated to assess 5+4+ drinking more accurately. These various items complement one another because no single item alone can adequately assess risk. As Dawson (1998) states

Given researchers' varying objectives and the lack of a single set of measures that works best toward all possible ends, it is not surprising that there is not real consensus as to what are the 'best' measures of consumption (p. 965).

The Game Day Survey was approved by the Institutional Review Board (IRB, 2006-U-604) (Appendix B). All data were collected anonymously. Participants reviewed the informed consent process and voluntarily accepted the terms before logging on to the survey.

Study Population

The study population for this investigation included approximately 50,000 University of Florida students who were enrolled for classes during the fall semester of 2006. A total of 2,000 students, ages 18-24, were randomly selected by the registrar to participate in the survey. The registrar used a Statistical Analysis Software (SAS) program to identify students and their e-mail addresses for the survey.

For the purposes of this inquiry, standardized tables indicated that at least 381 randomly selected subjects needed to participate in the survey for it to be considered a representative sample of the overall student population (Krejcie & Morgan, 1970). A power analysis conducted using Raosoft, Inc., web survey software corroborated the sample number provided in the table.

Given the population size, a margin of error of 5%, a confidence level of 95%, and an estimated response rate of 40% (with incentives), at least 367 participants were needed for this investigation. Previous surveys administered at this institution yielded modest response rates. For example, the 2004 Game Day Survey had a 35% response rate without using incentives. Other alcohol and drug surveys implemented at UF yielded less, approximately 20%-25%. Thus, a sample of 2,000 students was utilized for this investigation.

Instrumentation

The items from this study were based on the Game Day Survey created by Glassman and colleagues (2003, 2004). In 2003, Glassman and colleagues developed the Game Day Survey specifically designed to measure the alcohol consumption of fans, on the day (or night) of college football events (Haun, Glassman, & Dodd, 2007). The survey items were modified and adapted from the standardized Core Alcohol and Drug Survey Long Form developed by Dr. Presley and colleagues (Core Institute at Southern Illinois University, 1994). Other nationally recognized college alcohol instruments were also reviewed and utilized including the National College Health Assessment and the College Alcohol Survey (Wechsler et al., 2002). The survey was designed by the institution's Coordinator of Alcohol & Other Drug Prevention (Glassman). It was analyzed by a variety of experts from the University of Florida, including a college health promotion specialist, a student affairs administrator, an alcohol and drug researcher, and a Distinguished Professor in the College of Pharmacy. All expert reviewers had at least ten years of experience in their respective fields. The Game Day Survey was pilot-tested six times, with at least 15 UF college students completing the survey each time. Reliability coefficients, using Cronbach's alpha, for each of the scales based on the 2003 Survey were as

follows: alcohol consumption items, 0.86; consequences from alcohol consumption items, 0.82; and social norm items, 0.84.

The original Game Day Survey consisted of 30 items. Alcohol consumption items assessed the total number of drinks consumed on game day as well as the number of the drinks consumed before, during, and after the game. Nine items measured alcohol related consequences, utilizing dichotomous response options (yes/no). Three items included a 7-point categorical scale related to geographic settings for alcohol consumption (home, friend's home, restaurant, bar, tailgate area, other). In addition, there were three 5-point Likert interval items related to social norms concerning the perceived alcohol consumption of others; and four 5-point Likert ordinal items related to attitudes about game day drinking prevention initiatives, including support for policy change. Finally, three demographic items assessed participant age, gender, and attendee status (undergraduate, graduate, employee, UF Alumnus, Gator fan, visiting fan, other).

The Game Day Survey has been substantially revised since its inception in 2003. In 2004, survey items involving alcohol consumption were changed from ordinal responses, listing a range of drinks consumed, to continuous responses where participants could simply indicate the number of drinks they consumed up to 12+ drinks. In addition, the 2004 version of the Game Day Survey was administered electronically, rather than the onsite paper/pencil questionnaire utilized in 2003.

In 2006, additional questions were added to the survey to measure the constructs associated with the Theory of Planned Behavior as shown in Tables 3-1, 3-2, and 3-3. These 55 items included six items assessing Attitude Toward the Behavior, six items assessing Behavioral Beliefs, six items assessing Evaluation of Behavioral Outcomes, four items assessing Subjective

Norm, four items assessing Normative Beliefs, six items assessing Motivation to Comply, five items assessing Perceived Behavioral Control, six items assessing Control Beliefs, six items assessing Perceived Power, and four items assessing Behavioral Intention. For the indirect measures of the Attitude Toward the Behavior and Perceived Behavioral Control, the six items consisted of three cost (negative behavioral and Control Beliefs) and three benefit (positive behavioral and Control Beliefs) items associated with getting drunk on game day. These items were developed based on a literature review (Wall et al., 1998; Ajzen, 2002; Trafimow, 1996; Norman, Bennett, & Lewis, 1998). Tables 3-4–3-6 list items found in the literature review and their respective reliability scores.

A test-retest assessment was conducted to determine the reliability of the revised version of Game Day Survey items. These test-retest measures were completed in two Personal and Family Health (HSC 2100) classes taught at the University of Florida. The first was administered 9 days after the final UF home football game (November 27, 2006) and the retest was conducted 9 days later (December 6, 2006). Students were instructed to provide the last four digits of their student identification numbers on the top right hand corner of the paper/pencil survey. A total of 120 surveys were administered. Eighty-nine of these were returned with the information needed to match results, yielding a 74% response rate.

To determine the test-retest values for the categorical items and for the continuous variables, Spearman and Pearson correlation coefficients were calculated, respectively. Overall the test-retest results were reliable. Each item analysis was statistically significant at the 0.05 alpha level. According to Portney and Watkins (2000), correlation values of 0.00 to 0.25 indicate little or no relationship; values of 0.25 to 0.50 suggest a fair degree of relationship; values of 0.50 to 0.75 are considered moderate to good, and values above 0.75 are classified as

good to excellent. The results shown in tables 3-7–3-15 indicate at least a fair relationship between items and most correlations were moderate to good.

Table 3-7 illustrates that the seven demographic items had the highest correlation values, ranging from 1.00 to 0.97 with an average of 0.99. The six prevention items had modest correlation values ranging from 0.62 to 0.42 with an average of 0.53, as noted in Table 3-8. The two foil questions (GatorLight tip sheet and GatorHealth Guide) had the lowest correlation values in the prevention scale, 0.42 and 0.46, respectively. The foil items utilized for this survey were fictitious, meaning no participant should have indicated that they had seen the prevention initiative because it did not exist. The foil items represent a measure to assess the participant's social desirability when answering items. If the two foil questions were removed, the range for the prevention items would be slightly improved to 0.62 to 0.56 and the average would increase to 0.57.

Overall the test-retest results for the game day drinking items (Table 3-9), consequence items (Table 3-10) and social norms items (Tables 3-11) indicated good test-retest reliability (Portney & Watkins, 2000). The range for the game day drinking items was 0.87 to 0.53 with a good average of 0.77. The item with the 0.87 value was, "What is the total number of drinks that you typically consume before, during, and after a Gator home football game?" This item represented the dependent or endogenous variable for this study. The item with the lowest value in this scale (0.53) asked participants where they typically spend the majority of their time drinking alcoholic beverages before the game. This lower value may be due to the fact that students may participate in this activity in varied settings from one game to next. The range for the 11 consequence items was 1.00 to 0.29 with a good average of 0.73. The question with the 0.29 value asked participants if they vomited as a result of their game day related drinking over

the course of the 2006 football season. This item is consistent with other standardized surveys such as the Core Alcohol and Drug Survey (Presley et al., 1997). The three social norm items ranged from 0.85 to 0.75 with a good average of 0.79.

Overall, the test-retest reliability of Theory of Planned Behavior measures was moderate to good. The range of the 18 items assessing Attitude Toward the Behavior (direct and indirect measures, Table 3-12) was 0.88 to 0.41 with a moderate average of 0.71. The Attitude Toward the Behavior direct measures proved more reliable than the indirect measures with correlation averages of 0.80 and 0.66, respectively. The range of the 16 items which assessed the Subjective Norm (direct and indirect measures, Table 3-13) was 0.85 to 0.56 with a moderate average of 0.69. The Subjective Norm direct measures were more reliable than the indirect measures with correlation averages of 0.71 and 0.67, respectively. The range of the 17 items which assessed the Perceived Behavioral Control (direct and indirect measures, Table 3-14) was .85 to .54 with a moderate average of .68. The Perceived Behavioral Control direct measures were slightly less reliable than the indirect measures with averages of .62 and .70, respectively. Finally, the range of the four items measuring Behavioral Intention (Table 3-15) was 0.78 to 0.53 with a moderate average of .70. The item with the lowest value in the range (.53) was, "I intend to not drink any alcoholic beverages at the next Gator home football game I attend." Perhaps, if this item had been written more clearly the correlation would have been higher. For example, this item could have been rewritten as follows: "I intend to abstain from drinking any alcoholic beverages at the next Gator home football game I attend."

While most of the Game Day Survey items demonstrated adequate reliability, those with lower values may have been compromised from repeated exposure. For example, respondents had time between testing to think about issues in areas that had not been previously considered

and may have changed responses on certain items. The desire of the respondent to present socially desirable responses may also explain lower reliability coefficients. In addition, perhaps survey fatigue also compromised the reliability of these results. Nevertheless, the large majority of items yielded moderate to excellent correlation values, indicating stability over time.

Internal Consistency

To determine survey item reliability, Cronbach's alpha scores were calculated on each of the 14 Game Day Survey scales, and the results are presented in Table 3-16. As previously noted, correlation values of 0.50 to 0.75 are considered moderate to good, and values above 0.75 are classified as good to excellent (Portney & Watkins, 2000). Overall, the internal consistency values of the scales were acceptable, ranging from moderate to excellent.

The non-TPB scales had good reliability scores. The alcohol consumption, consequences, and the social norms reliability coefficients had good to excellent values ranging from 0.861, 0.841, and 0.689, respectively. The five prevention items generated a moderate reliability coefficient value of 0.608. This moderate level may be due to the relative visibility and heterogeneity of the prevention initiatives. For example, the advertisement in which the head football coach encourages students to be responsible is likely much more conspicuous to students than the *Code of Conduct*. Moreover, up to one-fifth of the participants indicated observing a prevention initiative that did not exist. Such inconsistencies may have lowered the Cronbach's alpha score.

The TPB scales produced a fairly wide range of reliability coefficients. The Attitude Toward the Behavior scale yielded the highest reliability score with a value of 0.955. However, the indirect measures of this construct produced lower values of 0.559 for Behavioral Beliefs and 0.685 for the Evaluations of Behavioral Outcomes. The Attitude Toward the Behavior scale was

the only TPB scale which did not include a matrix format; instead each of the six questions was asked independently. The Subjective Norm, Normative Beliefs, and the Motivation to Comply scales all had excellent reliability coefficients of 0.908, 0.941, and 0.949, respectively. The Perceived Behavioral Control, Control Beliefs, and Perceived Power yielded moderate to good reliability coefficients of 0.740, 0.668, and 0.793, respectively. The Behavioral Intentions scale produced a good reliability coefficient of 0.829.

Table 3-16 also includes the Cronbach's alpha values for each of the survey scales when the item of interest was removed from the analysis. Williams and colleagues (as cited by Komro, Perry, Munson, Stigler, & Farbakhsh, 2004) recommend removing an item if the Cronbach's value for a scale improves by ≥ 0.02 when the item is deleted. For example, the Cronbach's alpha value for the "Behavioral Beliefs" scale on the Game Day Survey is 0.559. When item number 21.4, asking about the likelihood of feeling hungover from drinking excessively on game day, was removed from the survey the Cronbach's alpha for the scale improves to .704. During future administrations of the game day survey strong consideration should be given to removing this item due to the increased Cronbach's alpha value for the scale. In addition, deleting items 21.3 concerning the embarrassment associated with becoming drunk, and 22.3 regarding the perceived importance of having sex with someone on game day, would increase the reliability of the Behavioral Beliefs and Evaluations of the Behavioral Outcomes scales, respectively.

Data Collection

The data for this investigation were collected electronically. Electronic or web-based surveys provide a means for improving survey participation, particularly among persons who have access to the internet (e.g., college students) (Schmidt, 1997; Couper, 2000). In a study where college students were randomly assigned to either a mail or a web-based survey, the

response rates were 40% and 63%, respectively (McCabe, Boyd, Couper, Crawford, & D'Arcy, 2002). Web-based data collection strategies have proliferated in a wide range of subject areas (Dillman, 2000) including alcohol and drug use (McCabe et al., 2002). The benefits of utilizing web-based surveys include reduced implementation costs, faster data collection, improved formatting, elimination of data entry, and reduced processing costs (Witmer, Colman, & Katzman, 1999, as cited by Kypri & Gallagher, 2003).

To further increase the response rate, Dillman (2000) recommended sending prenotification messages and multiple reminders. One week preceding the implementation of the survey, on November 13, 2006, approximately 2,000 randomly selected UF students received a prenotification message via e-mail. Utilizing a prenotification message is especially important when conducting e-mail surveys because of the ease with which an electronic survey can be deleted, particularly if a person is not aware of or ready to take the survey (Dillman, 2000). Participants received the prenotification e-mail explaining the purpose of the research, what the survey entailed, and how the data would be utilized. Participants were instructed to monitor their email for further information regarding the survey. The Game Day Survey was administered on November 20, 2006, the Monday after the final home football game. An e-mail was sent to the sample population with the link to the Web-based survey (Appendix C). This e-mail explained the rationale for the survey, the deadline for completing the survey, participant rights, and benefits of participation. Subjects who clicked on the hyperlink provided in the e-mail received general instructions on how to complete the survey. Participants selected response options using a left-click of the mouse. On November 27, December 4, and December 11, 2006 participants received electronic reminders to take the survey.

Survey incentives. Kypri and Gallagher (2003) studied strategies to increase web-based survey participation rates utilizing an alcohol-related survey. Their initial response rate was only 40%, but through multiple reminders (up to eight contacts) via mail, e-mail, and telephone contact, an 85% response rate was later obtained. Of the 150 college students eligible to participate in their study, 128 completed the survey. Both paper and pencil surveys were made available, but the large majority of participants chose to complete the survey electronically (n=123). Focus groups conducted prior to the study revealed that, without at least a token incentive, students would not likely complete a survey. This finding is consistent with the results obtained by Edwards and colleagues (2002). Based on their findings, Kypri and Gallagher recommended giving each participant a nonconditional token incentive.

Since only limited incentive monies existed for this study, it was not feasible to offer all 2,000 students a token incentive. Therefore, an alternate incentive strategy was developed. While the IRB (Institutional Review Board) at the University of Florida prohibits random distribution of incentives, performance based incentives are permitted. Thus, the incentive strategies used for this study were based more on logistics than on best practices. At the end of the survey, participants were instructed to send an e-mail to a specified address indicating their interest in receiving the incentive. This e-mail provided the contact information for participants. Because no identifiers were linked to participant survey responses, anonymity was maintained. The first three, the middle three, and the last three students completing the incentive protocol received a \$50.00 gift card to the UF Bookstore. A participant did not have to answer any questions to be eligible for the incentive. Incentives were awarded approximately one week following the close of the survey. Students were notified of their selection via e-mail and picked

up the gift card in the Department of Health Education and Behavior in the College of Health and Human Performance at UF.

Data Analysis

Survey Monkey, a commercial internet survey software program, was used to store the Game Day Survey data. Data were subsequently entered into SPSS (Statistical Package for the Social Sciences) statistical software package, version 14.0. All statistical analyses for this investigation were performed assuming a Type I error rate of $\alpha = 0.05$. Each question on the survey was coded numerically to facilitate the analysis of the aggregated data. All TPB items were coded 3 to -3 except the Motivation to Comply items, which were coded 1 to 7 as recommended by Ajzen and Fishbein (1980). This procedure is recommended to capture the psychology of a double negative, in which a belief that a behavior will not result in a negative outcome contributes positively to the individual's attitude (Glanz et al., 2002). Two Behavioral Beliefs, three Evaluation of Behavioral Outcomes, three Control Beliefs, three Perceived Power, three Perceived Behavioral Control items, and one Behavioral Intention item were reverse-coded to ensure that the anticipated participant responses would follow a consistent pattern within each of the respective scales.

Descriptive statistics such as the mean, median, standard deviation, and percentage were calculated to describe the demographic characteristics of the respondents. Descriptive statistics were also used to report the responses to the items which included drinking prevalence on game day, Attitude Toward the Behavior (drinking on game day), Subjective Norms, and Perceived Behavioral Control. Participant demographics were compared to the overall student population to determine the extent to which the sample was representative of the target population. These data were also used to help assess how respondents differed from nonrespondents.

The following statistical procedures were utilized to answer each of the research questions for this study.

Research Question 1:

What is the prevalence of Extreme Ritualistic Alcohol Consumption on game day for fall 2006? Frequencies were calculated to determine the prevalence of ERAC utilizing the Game Day Survey item which asked respondents “How many drinks do you typically consume on game day?” Responses to this item were recoded dichotomously, separating the participants engaging in ERAC on game day from those who do not. This recoded variable is the outcome measure for research questions two through five. In addition, ERAC rates were compared by ethnicity, year in school, gender, Greek status, and by legal drinking age (under/over 21) utilizing Chi-square analyses.

Research Question 2:

How much variance does the combination of constructs in the Theory of Planned Behavior explain when predicting Extreme Ritualistic Alcohol Consumption on game day?

Before conducting any multivariate analysis it was necessary to determine the relationship between the indirect measures, direct measures, behavioral intention, and behavior (Glanz et al., 2002). Zero order correlations were computed among each of the TPB constructs and reported in an inter-correlation matrix.

To correctly utilize the TPB, Ajzen and Fishbein (1980) recommend that each indirect measure should be multiplied by its corresponding item found in the complimentary indirect scale, and then those products should be summed together to create a mathematical or composite version of the direct measure. For example, the score for the Behavioral Belief item which states, “I would have more fun on game day if I got drunk on game day,” was multiplied by the

scores of its matching Evaluation of Behavioral Outcomes item, "Having fun on game day is important to me." The remaining five paired items were also calculated in this manner. Then all six product scores were added together to create a composite of the direct measure, Attitude Toward the Behavior. This procedure was also conducted with the Subjective Norm and Perceived Behavioral Control indirect measures as well.

A multiple logistic regression analysis was used to determine the amount of variance the TPB constructs account for when predicting ERAC (dichotomous variable) among college students on game day (Bobko, 2001). Logistic regression represents a specific type of regression analysis in which the outcome variable (categorical or discrete) is binary and the observatory or independent variable(s) can be of any type. The outcome or dependent variable for this analysis is the response to the question: "How many drinks do you typically consume on Game Day?" The results were recoded into a dichotomy, with the participants engaging in ERAC (10 or more drinks for males and eight or more drinks for females) coded as "yes," and those who do not coded as "no." The observed variables included the direct and indirect measures of the TPB constructs: Subjective Norm, Attitude Toward the Behavior, Perceived Behavioral Control, and Behavioral Intention (see Game Day Survey in Appendix A). The values for the pseudo R^2 statistics (Cox & Snell, and Nagelkerke statistics specific to multiple logistic regression) were calculated to determine the strength of the association between the outcome variable and collective set of observatory variables. The Cox & Snell and Nagelkerke statistics represent estimates of R^2 and are used to assess overall model fit (Mertler & Vannatta, 2002).

Research Question 3:

Which constructs within the Theory of Planned Behavior account for the largest proportion of variance when predicting Extreme Ritualistic Alcohol Consumption behavior among college students on game day? The odds ratio results from the multiple logistic regression analysis indicated which of the observatory variables were most influential in predicting ERAC behavior on game day (Mertler & Vannatta, 2002).

Research Question 4:

Do the constructs within the Theory of Planned Behavior differ by gender when predicting Extreme Ritualistic Alcohol Consumption among college students on game day?

Initially, in order to explore possible gender differences, a chi-square cross tabulation analysis was conducted with the ERAC (yes/no) and gender variables (Portney & Watkins, 2000). A subsequent multiple logistic regression analysis was computed to determine the differences between males and females as it relates to predicting ERAC on game day. Once again the outcome variable for this analysis was the response to the question: “How many drinks do you typically consume on Game Day?” which was recoded into a dichotomy, separating those participants who engaged in ERAC on game day from those who do not. The observatory variables also remained the same as in the previous analysis. However, separate multiple logistic regression analyses were conducted independently by gender.

Research Question 5:

Do the constructs within the Theory of Planned Behavior differ by grade classification when predicting Extreme Ritualistic Alcohol Consumption among college students on game day? A chi-square cross tabulation analysis was performed with the ERAC and grade classification variables to determine the differences between the groups (Portney &

Watkins, 2000). Separate multiple logistic regression analyses were conducted with each of the respective grade classifications to obtain information regarding the predictability of each of the TPB constructs among the academic designations.

Research Question 6:

What are the causal effects in predicting alcohol consumption rates using the constructs from the TPB? Analysis of Moment Structures (AMOS) 6.0 was used to conduct the path analysis to determine the causal links between the variables. This type of modeling technique provides information on whether the pattern of inter-correlations among the variables is consistent with the TPB as it relates to alcohol consumption on game day. The endogenous variable for this analysis is the response to the question: “How many drinks do you typically consume on Game Day?” The exogenous variables included the composite measures of the TPB constructs: Subjective Norm, Attitude Toward the Behavior, Perceived Behavioral Control, and Behavioral Intention. A series of multiple logistic regression analyses were conducted to determine the variable relationships specified in the path model. The causal model was depicted in a path diagram, which will be described in Chapter 4.

Goodness-of-fit indices were calculated in order to determine the extent to which the correlations observed in the data match those produced by the path analysis. This is analogous to determining the degree to which observed values correspond to predicted values in a simple linear regression equation. If the observed distribution of variables and the values generated by the statistical model correspond with one another, then the model fits the data. However, because of the varying characteristics of data sets, no consensus exists on the single best measure for determining model fit. Thus, in structural equation modeling a variety of model fit indices exist. In the present study the following goodness-of-fit indices were calculated: Chi-square,

Standardized Root Mean Square Residual (SRMR), relative fit index (RFI), Comparative Fit Index (CFI) and Root Mean Square Error of Approximation (RMSEA).

Summary

This chapter provided a description of the methods associated with this study, including research design, research variables, study population, instrumentation, human subjects permission form, item development, data collection, and analyses. A cross-sectional research design utilizing randomly selected college students at the University of Florida was employed for this investigation. Items for the survey were based on a literature review and other standardized instruments. The survey results contain information to determine which of the TPB constructs account(s) for the largest proportion of variance when predicting ERAC on game day. In addition, a path analysis was conducted to determine the causal effects in predicting alcohol consumption rates on game utilizing the TPB constructs.

Table 3-1. Game Day TPB Attitude Toward Behavior Direct and Indirect Measures

Construct	Item	Anchors
Attitude Toward Behavior (Direct Measures)	1. For me to get drunk on game day is:	Good - Bad
	2. For me to get drunk on game day is:	Beneficial - Harmful
	3. For me to get drunk on game day is:	Enjoyable - Unenjoyable
	4. For me to get drunk on game day is:	Healthy - Unhealthy
	5. For me to get drunk on game day is:	Favorable - Unfavorable.
	6. For me to get drunk on game day is:	Wise - Foolish.
Behavioral Beliefs (Indirect Measures)	1. I would have more fun if I got drunk on game day.	Extremely Likely - Extremely Unlikely
	2. I would be more social if I got drunk on game day.	
	3. My chances of hooking up with someone (having sex) would increase if I got drunk on game day.	
	4. I would have a hangover if I got drunk on game day.	
	5. I would enjoy watching the game less if I got drunk on game day.	
	6. I would embarrass myself if I got drunk on game day.	
Evaluations of Behavioral Outcomes (Indirect Measures)	1. Having fun on game day is important to me.	Strongly Agree - Strongly Disagree
	2. Being social on game day is important to me.	
	3. Meeting someone and hooking up (having sex) with them on game day is important to me.	
	4. Having a hangover on game day is a concern of mine.	
	5. Watching the game is important to me.	
	6. Embarrassing myself due to my drinking on game day is a concern of mine.	

Note: All anchors are on a seven point scale.

Table 3-2. Game Day TPB Subjective Norm Direct and Indirect Measures

Construct	Item	Anchors
Subjective Norm (Direct Measures)	1. The people in my life whom I value get drunk on game day.	Strongly Agree - Strongly Disagree
	2. The people in my life whom I value would approve of me getting drunk on game day.	
	3. Most people I hang out with get drunk on game day.	
	4. The people in my life whom I value encourage me to get drunk on game day.	
Normative Beliefs (Indirect Measures)	1. My best friend would approve of me getting drunk on game day.	Strongly Agree - Strongly Disagree, N/A
	2. My close friends would approve of me getting drunk on game day.	
	3. My mother (legal guardian) would approve of me getting drunk on game day.	
	4. My father (legal guardian) would approve of me getting drunk on game day.	
	5. My current partner would approve of me getting drunk on game day.	
	6. My ideal future partner would approve of me getting drunk on game day.	
Motivation to Comply (Indirect Measures)	1. When it comes to drinking alcohol, how motivated are you to meet the expectations of your best friend?	Very Motivated - Not Motivated At All, N/A
	2. When it comes to drinking alcohol, how motivated are you to meet the expectations of your close friends?	
	3. When it comes to drinking alcohol, how motivated are you to meet the expectations of your mother (legal guardian)?	
	4. When it comes to drinking alcohol, how motivated are you to meet the expectations of your father (legal guardian)?	
	5. When it comes to drinking alcohol, how motivated are you to meet the expectations of your current partner?	
	6. When it comes to drinking alcohol, how motivated are you to meet the expectations of your ideal future partner?	

Note: All anchors are on a seven point scale.

Table 3-3. Game Day TPB Perceived Behavioral Control Direct and Indirect Measures

Construct	Item	Anchors
Perceived Behavioral Control (Direct Measures)	1. I am confident that I can limit my alcohol consumption on game day.	Strongly Agree - Strongly Disagree
	2. I can resist pressure from friends to consume alcohol on game day.	
	3. It is difficult for me to drink moderately on game day.	
	4. As I get drunk, I start to lose control over the number of drinks I consume.	
	5. It's difficult for me to refuse free alcoholic drinks on game day.	
Control Beliefs (Indirect Measures)	1. Use a designated driver or safe transportation on game day.	Always - Never
	2. Attend pre-game tailgating activities on game day.	
	3. Are given free alcoholic drinks on game day.	
	4. Notice the police on game day.	
	5. Consider the financial costs associated with consuming alcoholic beverages on game day.	
	6. Feel hungover from drinking alcohol on the day after game day.	
Perceived Power (Indirect Measures)	1. Having a designated driver or safe transportation influences my decision to get drunk on game day.	Extremely Likely- Extremely Unlikely
	2. Attending pre-game tailgating opportunities influences my decision to get drunk on game day.	
	3. People offering me free alcoholic drinks influence my decision to get drunk on game day.	
	4. The presence of police deters me from getting drunk on game day.	
	5. The financial costs associated with alcoholic beverages deter me from getting drunk on game day.	
	6. Having a hangover the day after a game, deters me from getting drunk on game day.	

Note: All anchors are on a seven point scale.

Table 3-4. TPB Attitude Toward Behavior Items and Reliability Values from the Literature

Construct	Item	Cronbach's Alpha	Citation		
Attitude Toward Behavior (Direct Measures)	Drinking alcohol to get drunk is: Good - Bad.	0.84	1		
	Drinking alcohol to get drunk is: Beneficial - Harmful.				
	Drinking alcohol to get drunk is: Enjoyable - Unenjoyable.				
	Drinking alcohol to get drunk is: Healthy - Unhealthy.				
	Drinking alcohol to get drunk is: Favorable - Unfavorable.				
	Drinking alcohol to get drunk is: Wise - Foolish.				
	Behavioral Beliefs (Indirect Measures)			Drinking 3.5 pints 7 shorts in a session would make me feel more confident.	0.64
Drinking 3.5 pints 7 shorts in a session would make me feel happy.					
Drinking 3.5 pints 7 shorts in a session would make me suffer from a hangover later on/the next day.					
Relaxing/unwinding		N/A	3		
Having a hangover/feeling sick					
Having fun/socializing					
Damaging your health					
Evaluations of Behavioral Outcomes (Indirect Measures)	Reducing inhibitions	0.64	2		
	Behaving embarrassingly				
	Feeling more confident would be ...good/bad			N/A	3
	How pleasant or unpleasant are the consequences from binge drinking				
	Relaxing/unwinding				
	Having a hangover/feeling sick				
	Having fun/socializing				
Damaging your health					
Reducing inhibitions					
Behaving embarrassingly					

(Citations for the scales are listed as follows: 1 = Schlegel, D'Avernas, Zanna, Decourville, & Manske, 1992; 2 = Norman, Bennett, & Lewis, 1998; 3 = Johnston & White, 2004; 4= Wall, Hinson, & McKee, 1998; 5 = O'Callaghan, Chant, Callan, & Baglioni, 1997).

Table 3-5. TPB Subjective Norm Items and Reliability Values from the Literature

Construct	Item	Cronbach's Alpha	Citation
Subjective Norm (Direct Measures)	Perceived general societal pressure to engage in excessive alcohol consumption	N/A	4
	How likely or unlikely is it that most people who are important to you think you should drink alcohol in the next month	0.76	5
Normative Beliefs (Indirect Measures)	How likely is it that your spouse thinks it is OK for you to get drunk?	0.84	1
	How likely is it that your mother thinks it is OK for you to get drunk?		
	How likely is it that your father thinks it is OK for you to get drunk?		
	How likely is it that your close friends think it is OK for you to get drunk?		
	How likely is it that your close friends at work think it is OK for you to get drunk?		
Motivation to Comply (Indirect Measures)	With regard to my drinking, I want to do what my friends think I should.	0.62 (positive index)	2
		0.76 (negative index)	
	Friends	N/A	3
	Parents		
	Other family members		
	Partner		
	Work colleagues		

(Citations for the scales are listed as follows: 1 = Schlegel, D'Avernas, Zanna, Decourville, & Manske, 1992; 2 = Norman, Bennett, & Lewis, 1998; 3 = Johnston & White, 2004; 4= Wall, Hinson, & McKee, 1998; 5 = O'Callaghan, Chant, Callan, & Baglioni, 1997).

Table 3-6. TPB Perceived Behavioral Control Items and Reliability Values from the Literature

Construct	Item	Cronbach's Alpha	Citation
Perceived Behavioral Control (Direct Measures)	Rate the amount of control you have over your drinking behavior	0.81	4
	Rate the ease you have of controlling your drinking behavior		
	Could you limit your alcohol consumption to the point where "you just begin to feel intoxicated?"		
	How much control do you have over the whether you do or do not drink alcohol in the next month?"	0.76	5
	For me to drink alcohol in the next month is... If I wanted to I could easily drink alcohol in the next month		
Control Beliefs (Indirect Measures)	Celebrating an event would make me more/less likely to drink 3.5 pints/7 shorts in a session	0.81	2
	Being at a club or party would make me more/less likely to drink 3.5 pints/7 shorts in a session		
	Having to be up early the next day would make me more/less likely to drink 3.5 pints/7 shorts in a session	0.52	2
	Lack of money/cost of drinking Transportation difficulties Work/study commitments Taking prescription medication Lack of opportunity	N/A	3
Perceived Power (Indirect Measures)	Lack of money/cost of drinking Transportation difficulties Work/study commitments Taking prescription medication Lack of opportunity	N/A	3

(Citations for the scales are listed as follows: 1 = Schlegel, D'Avernas, Zanna, Decourville, & Manske, 1992; 2 = Norman, Bennett, & Lewis, 1998; 3 = Johnston & White, 2004; 4= Wall, Hinson, & McKee, 1998; 5 = O'Callaghan, Chant, Callan, & Baglioni, 1997).

Table 3-7. Game Day Test-Retest Demographic Items

Item	<i>r</i>
Which football games did you attend in 2006?	0.971†
What is your sex?	1.000
What is your classification?	0.974
How do you describe yourself?	1.000
Are you currently a member of a fraternity?	0.968
How old are you?	0.991†
How much do you weigh?	0.999†

Note: All items were statistically significant at 0.01 level, two tailed test

† Pearson Correlation conducted

Table 3-8. Game Day Test-Retest Prevention Items

Item	<i>r</i>
Ad in the “Alligator” with Coach Meyer’s picture encouraging Gators to be responsible fans?	0.555
GatorLight tip sheet about drinking in moderation?	0.463
The Gator Fan’s Code of Conduct?	0.564
GatorHealth Guide?	0.422
The public service announcement “Gators Set the Standard – Respect the Swamp?”	0.618
The public service announcement “Gators Set the Standard – Respect the Swamp” concerns which of the following:	0.562

Note: All items were statistically significant at 0.01 level, two tailed test

Table 3-9. Game Day Test-Retest Game Day Drinking Items

Item	<i>r</i>
Do you typically drink alcohol on Game Day?	0.748
Where do you spend the majority of your time drinking alcoholic beverages before the game?	0.813
Where do you spend the majority of your time drinking alcoholic beverages during the game?	0.530
Where do you spend the majority of your time drinking alcoholic beverages after the game?	0.814
What is the total number of alcoholic drinks that you typically consume before, during, and after a Gator home football game?	0.865
How many alcoholic drinks do you typically consume during the two hours before a Gator home football game?	0.827†
How many alcoholic drinks do you typically consume during a Gator home football game?	0.704†
How many alcoholic drinks do you typically consume during the two hours after a Gator home football game?	0.667†
What is the total number of alcoholic drinks that you consumed before, during, and after the Gator home football game against Western Carolina?	0.855†
What is the total number of hours that you typically spend drinking on Game Day?	0.830†
Not including Game Day, how many alcoholic drinks did you have the last time you “partied”/socialized?	0.861†

Note: All items were statistically significant at 0.01 level, two tailed test

† Pearson Correlation conducted

Table 3-10. Game Day Test-Retest Alcohol Consequence Items

Item	<i>r</i>
Had a hangover	0.699
Vomited	0.292
Drove after drinking alcohol	0.717
Drove after having 5 or more drinks	0.554
Had a memory loss (black out)	0.772
Was hurt or injured	0.792
Got into a fight or argument	0.700
Got reprimanded by the police	1.000
Arrested/ticketed by the police	1.000
Took advantage of someone sexually	1.000
Had been taken advantage of sexually	0.491

Note: All items were statistically significant at 0.01 level, two tailed test

Table 3-11. Game Day Test-Retest Social Norm Items

Item	<i>r</i>
What percentage of your friends do you believe typically get drunk on game day?	0.845
What percentage of current UF students do you believe typically get drunk on game day?	0.746
What percentage of Gator Fans (who are not current students) do you believe typically get drunk on game day?	0.780

Note: All items were statistically significant at 0.01 level, two tailed test

Table 3-12. Game Day Test-Retest Attitude Toward the Behavior Indirect and Direct Items

Item	<i>r</i>
I would have more fun if I got drunk on game day.	0.818
I would be more social if I got drunk on game day.	0.791
My chances of hooking up with someone (having sex) would increase if I got drunk on game day.	0.762
I would have a hangover if I got drunk on game day.	0.495
I would enjoy watching the game less if I got drunk on game day.	0.408
I would embarrass myself if I got drunk on game day.	0.521
Having fun on game day is important to me.	0.711
Being social on game day is important to me.	0.596
Meeting someone and hooking up (having sex) with them on game day is important to me.	0.818
Having a hangover on game day is a concern of mine.	0.650
Watching the game is important to me.	0.842
Embarrassing myself due to my drinking on game day is a concern of mine.	0.518
For me to get drunk on game day is: good/bad	0.877
For me to get drunk on game day is: beneficial/harmful	0.756
For me to get drunk on game day is: enjoyable/unenjoyable	0.793
For me to get drunk on game day is: healthy/unhealthy	0.663
For me to get drunk on game day is: favorable/unfavorable	0.828
For me to get drunk on game day is: wise/foolish	0.886

Note: All items were statistically significant at 0.01 level, two tailed test

Table 3-13. Game Day Test-retest Subjective Norm Indirect and Direct Items

Item	<i>r</i>
My best friend would approve of me getting drunk on game day.	0.828
My close friends would approve of me getting drunk on game day.	0.849
My mother (legal guardian) would approve of me getting drunk on game day.	0.776
My father (legal guardian) would approve of me getting drunk on game day.	0.676
My current partner would approve of me getting drunk on game day.	0.727
My ideal future partner would approve of me getting drunk on game day.	0.729
When it comes to drinking alcohol, how motivated are you to meet the expectations of your best friend?	0.578
When it comes to drinking alcohol, how motivated are you to meet the expectations of your close friends?	0.619
When it comes to drinking alcohol, how motivated are you to meet the expectations of your mother (legal guardian)?	0.573
When it comes to drinking alcohol, how motivated are you to meet the expectations of your father (legal guardian)?	0.589
When it comes to drinking alcohol, how motivated are you to meet the expectations of your current partner?	0.612
When it comes to drinking alcohol, how motivated are you to meet the expectations of your ideal future partner?	0.559
The people in my life whom I value get drunk on game day.	0.590
The people in my life whom I value would approve of me getting drunk on game day.	0.816
Most people I hang out with get drunk on game day.	0.783
The people in my life whom I value encourage me to get drunk on game day.	0.685

Note: All items were statistically significant at 0.01 level, two tailed test

Table 3-14. Game Day Test-Retest Perceived Behavioral Control Indirect and Direct Items

Item	<i>r</i>
Use a designated driver or safe transportation on game day.	0.634
Attend pregame tailgating activities on game day.	0.739
Are given free alcoholic drinks on game day.	0.758
Notice the police on game day.	0.613
Consider the financial costs associated with consuming alcoholic beverages on game day.	0.630
Feel hung over from drinking alcohol on the day after game day.	0.688
Having a designated driver or safe transportation influences my decision to get drunk on game day.	0.582
Attending pre-game tailgating opportunities influences my decision to get drunk on game day.	0.821
People offering me free alcoholic drinks influence my decision to get drunk on game day.	0.826
The presence of police deters me from getting drunk on game day.	0.695
The financial costs associated with alcoholic beverages deter me from getting drunk on game day.	0.762
Having a hangover the day after a game, deters me from getting drunk on game day.	0.673
I am confident that I can limit my alcohol consumption on game day.	0.612
I can resist pressure from friends to consume alcohol on game day.	0.566
It's difficult for me to drink moderately on game day.	0.689
As I get drunk, I start to lose control over the number of drinks I consume.	0.539
It's difficult for me to refuse free alcoholic drinks on game day.	0.706

Note: All items were statistically significant at 0.01 level, two tailed test

Table 3-15. Game Day Test-retest Behavioral Intention Items

Item	<i>r</i>
I intend to get drunk at the next Gator home football game I attend:	0.769
I intend to drink in moderation at the next Gator home football game I attend:	0.775
I intend to not drink any alcoholic beverages at the next Gator home football game I attend:	0.531
I intend to get drunk at every Gator home football game I attend:	0.727

Note: All items were statistically significant at 0.01 level, two tailed test

Table 3-16. Game Day Survey Scale Reliability

Scale variable	Type of variable	Number of response options	Cronbach's Alpha if Item Deleted	Reliability coefficient
Prevention Items	Continuous	2		0.608
Coach Meyer's ad Q8.1			0.574	
GatorLite tips (foil) Q8.2			0.570	
Code of conduct Q8.3			0.524	
Health guide (foil) Q8.4			0.521	
PA Q8.5			0.576	
Alcohol Consumption	Continuous	Open-ended		0.861
Total # Q12			0.804	
Before # Q13			0.817	
During # Q14			0.875	
After # Q15			0.829	
UWC Q16			0.854	
Last party Q18			0.826	
Consequences	Continuous	5		0.841
Hangover Q19.1			0.851	
Vomited Q19.2			0.820	
Drove after drink Q19.3			0.830	
Drove after ≥ 5 Q19.4			0.823	
Blackout Q19.5			0.815	
Hurt Q19.6			0.815	
Fight Q19.7			0.822	
Reprimanded Q19.8			0.830	
Ticketed Q19.9			0.830	
Took advantage Q19.10			0.832	
Taken advantage Q19.11			0.834	
Social Norms	Continuous	3		0.689
Your friends Q20.1			0.716	
Current UF Q20.2			0.475	
Gator fans Q20.3			0.484	
Attitude Toward Behavior	Continuous	7		0.955
Good-Bad Q23			0.941	
Beneficial-Harmful Q24			0.943	
Enjoyable-Unenjoyable Q25			0.942	
Healthy-Unhealthy Q26			0.965	
Favorable-Unfavorable Q27			0.938	
Wise foolish Q28			0.944	
Behavioral Beliefs	Continuous	7		0.559
Fun Q21.1			0.310	
Social Q21.2			0.337	
Sex Q21.3			0.466	

Table 3-16. Continued

Scale variable	Type of variable	Number of response options	Cronbach's Alpha if Item Deleted	Reliability coefficient
Hangover Q21.4			0.704	
Enjoy Q21.5			0.534	
Embarrass Q21.6			0.583	
Evaluations of Behavioral Outcomes	Continuous	7		0.685
Fun important Q22.1			0.615	
Social important Q22.2			0.611	
Sex important Q22.3			0.703	
Hangover important Q22.4			0.645	
Watching important Q22.5			0.636	
Embarrassing important Q22.6			0.648	
Subjective Norm	Continuous	7		0.908
Value getting drunk Q31			0.836	
Approve of getting drunk Q32			0.874	
Hang out with drunk people Q33			0.897	
Encourage getting drunk Q34			0.883	
Normative Beliefs	Continuous	8		0.941
Best friend approve Q29.1			0.929	
Close friends approve Q29.2			0.927	
Mother approve Q29.3			0.940	
Father approve Q29.4			0.938	
Current partner approve Q29.5			0.924	
Future partner approve Q29.6			0.920	
Motivation to Comply	Continuous	8		0.949
Friend Q30.1			0.940	
Close friends Q30.2			0.942	
Mother Q30.3			0.940	
Father Q30.4			0.941	
Current Partner Q30.5			0.936	
Future Partner Q30.6			0.936	
Perceived Behavioral Control	Continuous	7		0.740
Limit alcohol Q34.1			0.728	
Peer pressure Q34.2			0.717	
Drink moderately Q34.3			0.660	
Loss of control Q34.4			0.666	
Free drinks Q34.5			0.684	
Control Beliefs	Continuous	7		0.668
Use designated driver Q32.1			0.626	
Attend tailgating Q32.2			0.563	
Given free alcoholic drinks Q32.3			0.580	
Notice police Q32.4			0.664	

Table 3-16. Continued

Scale variable	Type of variable	Number of response options	Cronbach's Alpha if Item Deleted	Reliability coefficient
Consider financial costs Q32.5			0.655	
Feel hungover after Q32.6			0.646	
Perceived Power	Continuous	7		0.793
Designated driver influences Q33.1			0.750	
Tailgating influences Q33.2			0.754	
Free drinks influence Q33.3			0.754	
Police influence Q33.4			0.768	
Cost influence Q33.5			0.761	
Hangover influence Q33.6			0.778	
Behavioral Intentions	Continuous	8		0.829
Drunk next game Q35.1			0.726	
Moderation next game Q35.2			0.814	
Abstain next game Q35.3			0.805	
Drunk at every game Q35.4			0.783	

CHAPTER 4 RESULTS

Self-reported rates of alcohol consumption on college football game day were examined in this study. More specifically, the Theory of Planned Behavior (TPB) was utilized in a survey to predict Extreme Ritualistic Alcohol Consumption (ERAC) among a random sample of college students at the University of Florida. ERAC, a concept developed for this study, identifies drinking practices which occur on game day. ERAC was defined as consuming 10 or more drinks on game day for a male, and eight or more drinks for a female. The ERAC measure provides more specificity than the standard 5+4+ drinking measure in identifying at-risk drinkers.

The results of this investigation are organized to address six research questions:

- What is the prevalence of Extreme Ritualistic Alcohol Consumption on a typical game day for fall 2006?
- How much variance does the combination of constructs in the Theory of Planned Behavior explain when predicting Extreme Ritualistic Alcohol Consumption on game day?
- Which constructs within the Theory of Planned Behavior (Subjective Norm, Attitude Toward the Behavior, Perceived Behavioral Control, and Behavioral Intention) account for the largest proportion of variance when predicting Extreme Ritualistic Alcohol Consumption behavior among college students on game day?
- Do the constructs within the Theory of Planned Behavior differ by gender when predicting Extreme Ritualistic Alcohol Consumption among college students on game day?
- Do the constructs within the Theory of Planned Behavior differ by grade classification when predicting Extreme Ritualistic Alcohol Consumption among college students on game day?
- What are the causal effects in predicting alcohol consumption rates using the constructs from the TPB?

Participant Characteristics

The target population for this study was college students, ages 18 to 24 years, attending the University of Florida. Of the 2,096 participants sent a survey, 15 e-mails were returned as "undeliverable," and one participant was removed from the analysis due to incomplete data. A total of 740 students out of the 2,080 eligible participants completed the Game Day Survey yielding a 36% response rate.

Table 14-1 contains the demographic data for the participants, as well as the overall student population. Of the respondents the majority were Caucasian (73.6%) followed by, Hispanic or Latino (11.6%), Asian or Pacific Islander (6.9%), African-American (6.2%), American Indian/Alaskan Native (0.3%), and other ethnic groups (1.4%). Students were broadly distributed by grade classification (20.4% freshmen, 18.9% sophomore, 10.2%, juniors, 27.2% seniors, and 23.2% graduate/professional students), and except for freshmen and graduate/professional students, these percentages also correspond to those for the UF student body as a whole. Females composed 60.8% of the sample, a somewhat higher value than the percentage of females on campus. Approximately one out every five participants (19.4%) was a member of a fraternity or sorority (referred to as part of the campus "Greek" system). The mean age of the sample was 20.30 years ($SD= 1.66$), with ages ranging from 18-24 years. The sample demographics corresponded to the overall student demographic population with the exception of a slight overrepresentation of females and Caucasians.

In addition to the demographic background of the participants, the descriptive statistics provided fundamental information concerning the game day habits of college students. For example, approximately four out of five (80.1%) participants attended at least one home game during the 2006 college football season. Approximately half (50.8%) of all survey respondents

(58.1% of males and 46% of females) indicated that they typically drank on game day, but many drank in moderation with the mean number of drinks consumed equaling 3.9 ($SD= 5.06$).

Finally, while participants on average spent two and a half (2.55; $SD=3.25$) hours drinking on game day; one in five (21.4%) participants reported drinking for five or more hours.

Research Questions

What is the Prevalence of Extreme Ritualistic Alcohol Consumption on a Typical Game Day for Fall 2006?

A frequency analysis was performed on the Game Day Survey item “How many drinks do you typically consume on game day?” Responses to this item were recoded to categorize those participants who engaged in Extreme Ritualistic Alcohol Consumption (ERAC) on game day from those who do not. Male participants who consumed 10 or more drinks on game day and females who consumed eight or more drinks were coded into the ERAC group, and participants who did not meet these criteria were coded into the non-ERAC group. As Table 4-2 indicates 15.7% (116) of the sample engaged in ERAC on game day. When analyzed by gender, males engaged in ERAC (23.4%) at more than twice the rate of females (10.7%). The Chi-square analysis revealed that males were approximately 2.5 times more likely to engage in ERAC on game day than females ($OR = 2.565, p < 0.001$).

ERAC rates were also analyzed by grade classification. The Chi-square results ($p < .001$), found in Table 4-3, illustrate that students enrolled in the more advanced grades (upperclassmen) engaged in ERAC at higher rates than their counterparts (underclassmen). The ERAC rate for freshmen on game day was 6.0%, for sophomores 10.7%, for juniors 15.7%, and for seniors 24.9%. In addition, 18.7% of the graduate/professional students engaged in ERAC, a rate, second only to that of seniors.

Table 4-4 shows the Chi-square results ($p < 0.001$) for ERAC subdivided by ethnicity. Caucasians drank at disproportionately high rates compared to the other ethnicities. Nearly one-fifth of Caucasians (18.0%) engaged in ERAC on game day followed by Hispanics/Latinos (15.1%). Blacks/African Americans and Asian/Pacific Islanders engaged in ERAC at substantially lower rates, 2.2% and 2.0%, respectively. The “Other” category included American Indians/Alaskan Natives and other participants who did not classify themselves into any of the aforementioned ethnic groups. The ERAC rate for this group was 25%. Note the “Other” category includes only 1.7% ($n=12$) of the total sample, and generalizing the findings associated with this particular group is not recommended.

The ERAC rates were also analyzed by Greek status and legal drinking age. As Table 4-5 illustrates, nearly a quarter (24.5%) of Greeks engaged in ERAC on game day compared to 13.6% of non-Greeks. The Chi-square analysis revealed that Greeks were approximately twice as likely, to engage in ERAC on game day than non-Greeks ($OR = 2.060, p < .001$). In addition, 23.5% of the participants, age 21 or over, indicated that they engage in ERAC on game day, compared to 9.7% of students under the legal drinking age. The results indicated that the participants of legal drinking age were nearly three times more likely to engage in ERAC on game day than underage participants ($OR = 2.865, p < .001$). See Table 4-6 for the distribution rates of ERAC by legal drinking age.

The more conventional 5+4+ drinking measure was also assessed in this study. Table 4-7 summarizes the ERAC rates and 5+4+ drinking rates on game day by demographic status. Overall, the 5+4+ drinking rates on game day were at least twice as high as the ERAC rates (36.2% 5+4+ compared to 15.7% ERAC). Males took part in this behavior (43.1%) at higher rates than females (31.8%). More than half of the seniors and two-fifths of the

graduate/professional students in this sample reported 5+4+ drinking on game day. Caucasians engaged in 5+4+ drinking (40.6%) at substantially higher rates than the other ethnicities. Over two-fifths Greeks (46.9%) engaged in 5+4+ drinking; whereas, approximately one-third (33.7%) of non-Greeks participated in this behavior on game day. Finally, 52.5% of those participants 21 years or older and 23.7% of those under the legal drinking age, engaged in 5+4+ drinking on game day.

How Much Variance Does the Combination of Constructs in the Theory of Planned Behavior Explain When Predicting Extreme Ritualistic Alcohol Consumption on Game Day?

Table 4-8 illustrates the zero order correlations computed among each of the TPB constructs. The inter-correlation matrix reveals a statistically significant relationship between each of the TPB direct measures and Behavioral Intention. The bivariate relationship between Behavioral Intention and Attitude Toward the Behavior was 0.597 which indicates a moderate relationship at the $\alpha = 0.01$ significance level. The relationship between Behavioral Intention and Subjective Norm was slightly stronger at 0.652 and was also statistically significant at the $\alpha = 0.01$ significance level. The relationship between Behavioral Intention and Perceived Behavioral Control was weak at 0.107 but was statistically significant at the $\alpha = 0.05$ significance level. Overall the correlation values indicate statistically significant relationships between the variables, but are not highly correlated. The TPB variables are independent from one another, thus limiting concerns of multicollinearity.

Once the relationship between the direct measures and behavioral intention was established, a multiple logistic regression analysis was conducted to determine the amount of variance in predicting ERAC attributable to the TPB constructs. The results from the logistic regression (n=318) reveal the Cox and Snell pseudo R^2 value was 0.39 and the Nagelkerke

pseudo R^2 value was 0.61 and both were statistically significant at the 0.05 level. Overall, the model correctly classified 88.7% of the cases. As shown in Table 4-9, the predictor set had a significant effect on ERAC (Model Chi-Square = 156.08, $df = 4$, $p < 0.001$). Depending on the Cox and Snell or Nagelkerke R^2 estimates, the TPB constructs accounted for 39% or 61%, respectively, of the Extreme Ritualistic Alcohol Consumption that occurs on a typical game day.

In addition to determining the prevalence of alcohol use on game day, this investigation sought to determine the amount of variance explained by the combination of constructs in the Theory of Planned Behavior. The two pseudo- R^2 statistics (Cox & Snell and Nagelkerke statistics specific to multiple logistic regression) revealed that, as a whole, the TPB model accounted for 39% and 61%, respectively, of the variance in explaining ERAC on game day. The discrepancy between the two R^2 estimates result from the methods of calculation. The simpler Cox & Snell formula is based on the estimated model likelihood (L) value. More specifically, the L for an intercept-only model is divided by the L for the full model, and the n-th root of the resulting quotient is then subtracted from one. The more complex Nagelkerke statistic takes the Cox and Snell result and divides it by a Cox and Snell value having a full model likelihood of one. The Nagelkerke statistic takes into account that a perfectly fitting full model will not have a correct Cox and Snell value of 1.0. Conversely, a full model that is equivalent to an intercept-only model will not have a correct Nagelkerke value of 0.0 (Hair, et al., 2006).

Which Constructs within the Theory of Planned Behavior Account for the Largest Proportion of Variance when Predicting Extreme Ritualistic Alcohol Consumption Behavior among College Students on Game Day?

The odds ratio results from the multiple logistic regression analysis shown in Table 4-9, indicated Behavioral Intention (OR = 1.40, $p < 0.001$) was the strongest predictor of ERAC on

game day. A one unit change in this variable's score was associated with a 40% increase in the odds of engaging in ERAC. The odds ratio results from the Attitude Toward the Behavior variable (OR = 1.04, $p = 0.025$) and the Subjective Norm variable (OR = 1.02, $p = 0.010$) were much more modest. Perceived Behavioral Control also predicted ERAC at a statistically significant level (OR = .97, $p = 0.028$). However, a one unit change in this variable's score was associated with a 3% decrease in the odds of engaging in ERAC. In summary, while each of the TPB constructs was statistically significant, Behavioral Intention was the only construct which yielded a substantial odds ratio value.

Do the Constructs within the Theory of Planned Behavior Differ by Gender When Predicting Extreme Ritualistic Alcohol Consumption among College Students on Game Day?

As shown previously in Table 4-2, the Chi-square analysis conducted with the variables ERAC and gender revealed that males engage in this behavior at higher rates than females. Separate multiple logistic regression analyses were conducted with females and males (Tables 4-10 and 4-11, respectively) to determine if the motivations for engaging in ERAC, based on the TPB, differ by gender.

The multiple logistic regression results indicate that Behavioral Intention and Perceived Behavioral Control were the only two statistically significant TPB variables which predicted ERAC among females (Chi-Square = 67.92, $df = 4$, $p < 0.001$). The model correctly classified 87.2% of the cases. The Cox and Snell pseudo R^2 value was 0.29 and the Nagelkerke pseudo R^2 value was 0.55, and both were statistically significant at $p < 0.001$. The odds ratio results for Behavioral Intention (OR = 1.42, $p < 0.001$) revealed that it was the strongest predictor of ERAC on game day among females. A one unit change in this variable's score was associated with a 42% increase in the odds of engaging in ERAC. The odds ratio for Perceived Behavioral

Control predicted ERAC at a statistically significant level ($OR = 0.95, p = 0.031$). A one unit change in this variable's score was associated with a 5% decrease in the odds of engaging in ERAC. Thus, the more perceived control females report, the less likely they were to engage in ERAC.

Table 4-11 illustrates the multiple logistic regression results conducted with males. Attitude Toward the Behavior and Behavioral Intention accounted for 48% to 68% of the Extreme Ritualistic Alcohol Consumption, respectively. The model correctly classified 86.2% of the cases. Behavioral Intention and Attitude Toward the Behavior represented the only two statistically significant TPB variables which predicted ERAC among males ($Chi\text{-}Square = 80.51, df = 4, p < 0.001$). The odds ratio results for Behavioral Intention revealed that it was the strongest predictor of ERAC ($OR = 1.42, p < 0.001$). A one unit change in the score of this variable was associated with a 42% increase in the odds of engaging in ERAC. The odds ratio for Attitude Toward the Behavior also predicted ERAC at a statistically significant level ($OR = 1.06, p < 0.031$). A one unit change in the score of this variable was associated with a 6% increase in the odds of engaging in ERAC. Therefore, the more positive male attitudes were toward alcohol, the more likely they were to engage in ERAC.

In summary, Behavioral Intention was the strongest predictor of ERAC among males and females, while the Subjective Norm construct was not predictive of ERAC with either gender. Perceived Behavioral Control was a moderate predictor of ERAC among females, but not with males. Attitude Toward the Behavior was a moderate predictor of ERAC among males but not with females. Thus, male ERAC rates on game day are explained in part by their positive expectancies associated with alcohol use on game day, whereas female ERAC rates decline as their perceived control increases.

Do the Constructs within the Theory of Planned Behavior Differ by Grade Classification When Predicting Extreme Ritualistic Alcohol Consumption among College Students on Game Day?

As previously shown in Table 4-3, the Chi-square analysis conducted on the variables ERAC and grade classification revealed that there are statistically significant ERAC patterns among the grade classifications, with more advanced grades (juniors, seniors, and graduates/professional students) tending to engage in ERAC at higher rates than the less advanced grade classifications (freshmen and sophomores). Separate multiple logistic regression analyses were conducted with each of the five grade classifications independently to determine their respective influence on predicting ERAC.

The results revealed no statistically significant findings among freshmen or sophomores. However, with juniors (Table 4-12) both the Subjective Norm (OR = 1.04, $p = 0.025$) and Behavioral Intention (OR = 1.41, $p = 0.025$) odds ratios were statistically significant. The model correctly classified 79.5% of the cases (Chi-Square = 45.61, $df = 4$, $p < 0.001$). The Cox and Snell pseudo R^2 value was 0.44 and Nagelkerke pseudo R^2 value was 0.69, and both were statistically significant at the 0.05 level.

The multiple logistic regression results conducted with seniors, shown in Table 4-13, indicated the overall model of one predictor (Behavioral Intention) was statistically reliable in distinguishing between those who engage in ERAC from those who do not (Chi-Square = 44.75, $df = 4$, $p < .001$). The model correctly classified 70.8% of the cases. Regression coefficients are presented in Table 4-13. The odds ratio results for Behavioral Intention (OR = 1.31, $p = 0.018$) revealed that it was the only statistically significant TPB predictor of ERAC on game day among seniors. A one unit change in the score of this variable was associated with a 31% increase in the

odds of engaging in ERAC. The Cox and Snell pseudo R^2 value was 0.37 and the Nagelkerke pseudo R^2 value was 0.53, and both were statistically significant at the 0.05 level.

Finally, Table 4-14 illustrates the multiple logistic regression results conducted with graduate/professional students, which show that the TPB accounted for 49% to 73% of ERAC that occurs on a typical game day. The model correctly classified 89.5% of the cases. Behavioral Intention was the only construct statistically reliable in distinguishing between those who engage in ERAC from those who do not (Chi-Square = 25.33, $df = 4$, $p < 0.001$). The odds ratio results for Behavioral Intention (OR = 2.23, $p = 0.021$) revealed it was a strong predictor of ERAC on game day among seniors. A one unit change in the score of this variable was associated with nearly a two-and-a-half-fold increase in the odds of engaging in ERAC on game day.

In summary, Behavioral Intention was a strong predictor of ERAC among juniors, seniors, and graduate/professional students. None of the other TPB constructs were statistically significant in predicting ERAC among the various grade classifications, except for Subjective Norm, which was a moderate predictor of ERAC among juniors. There were no statistically significant predictors among the freshmen and sophomore classifications.

While the logistic regression results from the grade classification differences were minimal from a pragmatic perspective, the findings from the Chi-square analysis on ERAC and legal drinking age, shown in Table 4-16 warranted further inquiry. Indeed, the odds ratio for the legal drinking age was 2.865 (1.892 - 4.340); ($p < 0.001$) which indicates that participants 21 and over were nearly three times more likely to engage in ERAC on game day than those under the legal drinking age. Thus, an additional logistic regression analysis was conducted to determine if the TPB constructs differ by legal drinking age status in predicting ERAC on game day.

The multiple logistic regression results conducted with underage participants (Table 4-15) indicated the overall model of two predictors (Subjective Norm and Behavioral Intention) was statistically reliable in distinguishing between those who engage in ERAC from those who do not (Chi-Square = 71.99, $df = 4$, $p < 0.001$). The model correctly classified 93.7% of the cases. The odds ratio for Subjective Norm predicted ERAC at a statistically significant level (OR = 1.03, $p = 0.018$). A one unit change in the score of this variable was associated with a 3% increase in the odds of engaging in ERAC. The odds ratio results for Behavioral Intention (OR = 1.37, $p = 0.006$) revealed that it was the strongest predictor of ERAC on game day among underage participants. A one unit change in the score of this variable was associated with a 37% increase in the odds of engaging in ERAC. The Cox and Snell pseudo R^2 value was 0.37 and the Nagelkerke pseudo R^2 value was 0.70, and both were statistically significant at the 0.05 level.

Table 4-16 illustrates the multiple logistic regression results conducted with participants of legal drinking age, which show that the TPB constructs accounted for 37% to 54% of the ERAC that occurs on a typical game day. The model correctly classified 83.6% of the cases. Behavioral Intention was the only construct statistically reliable in distinguishing between those who engage in ERAC from those who do not (Chi-Square = 74.17, $df = 4$, $p < 0.001$). The odds ratio results for Behavioral Intention (OR = 1.41, $p < 0.001$) revealed that it was a strong predictor of ERAC on game day among participants of legal drinking age. A one unit change in the score of this variable was associated with a 41% increase in the odds of engaging in ERAC on game day.

In summary, the TPB proved to be slightly more effective in predicting ERAC among underage participants. For underage participants Subjective Norm and Behavioral Intention were predictive of ERAC, whereas for participants of legal drinking age only Behavioral Intention was

predictive of ERAC. As with previous logistic regression analyses Behavioral Intention was the strongest predictor of ERAC.

What Are the Causal Effects in Predicting Alcohol Consumption Rates Using the Constructs from the TPB?

Table 4-17 illustrates that, overall, the goodness-of-fit measures were acceptable. The Chi-square test of model fit was statistically significant, $\chi^2(2) = 18.352, p < 0.001$. The Standardized Root Mean Square Residual (SRMR) of 0.036, the relative fit index (RFI) of 0.844, and the Comparative Fit Index (CFI) of 0.972 all fall within the acceptable ranges for their respective indices (Hair, Black, Babin, Anderson, & Tatham, 2006). Since the Root Mean Square Error of Approximation (RMSEA) is a goodness-of-fit index with a known statistical distribution, the calculated value yields a p-value and a confidence interval for the population RMSEA. Hair and colleagues (2006) recommend an RMSEA less than .08 for studies with fewer than 13 observed variables and fewer than 250 observations. This analysis yielded an RMSEA of 0.161, $p < 0.001$ with a 90% confidence interval of (0.099, 0.223) suggesting an inadequate model fit. While the high RMSEA value warrants caution when interpreting the results from the path analysis, goodness-of-fit measures may vary from acceptable to unacceptable depending on the index used (Hair, et al., 2006). Overall, the goodness-of-fit measures indicate that the TPB model represents an acceptable model for explaining alcohol consumption on game day.

Figure 4-1 illustrates the standardized causal links between the TPB variables when used to predict alcohol consumption among college students on game day. In the path analysis, correlations between variables are represented by double headed arrows, and a straight line with a single arrowhead denotes a direct causal effect (Mertler & Vannatta, 2002). There was a modest correlation between Attitude Toward the Behavior and Subjective Norm ($r = 0.51, p < 0.001$) (Portney & Watkins, 2000), but there were no statistically significant correlations found

between PBC and the other TPB constructs. Further, intentions (Behavioral Intention) to drink alcohol on game day predicted actual behavior ($R^2 = 0.52$) with a standardized path coefficient of 0.72. Intentions, in turn, were predicted by Attitude Toward the Behavior and Subjective Norm constructs ($R^2 = 0.54$), with standardized path coefficients of 0.39 and 0.46, respectively. In general, positive expectancies concerning alcohol use (Attitude Toward the Behavior) and perceived acceptance of drinking (Subjective Norms) predicted intentions (Behavioral Intention) to get drunk on game day. The path analysis indicated that Perceived Behavioral Control (PBC) did not elicit any statistically significant path coefficients between Behavioral Intentions or the behavior (number of drinks consumed on game day).

Table 4-18 provides information on the direct and indirect effects on Behavioral Intention and behavior (number of drinks consumed on game day). The indirect effects on the number of drinks consumed for the constructs Attitude Toward the Behavior and Subjective Norm were 0.278 and 0.330 $p < 0.001$, respectively. Behavioral Intention served as the strongest predictor for the number of drinks consumed on game day, and to some extent it mediated the impact of the other constructs. Nevertheless, Attitude Toward the Behavior and Subjective Norm variables contributed significantly to the explanatory capacity of the TPB model, while the Perceived Behavioral Control construct failed to elicit any statistically significant direct or indirect effects.

Figure 4-2 reveals that the path coefficients do not change when the PBC construct is removed from the TPB, nor do the goodness-of-fit measures vary substantially (Table 4-19). The original Theory of Reasoned Action (TRA) does not include the PBC construct; thus its removal has precedent. A Chi-square difference test was conducted between the TPB and the TRA path analyses to determine the extent to which these two models differ. The results were not statistically significant, $\chi^2(5) = .906, p = .97$, indicating the more complex model (TPB with

PBC construct) does not enhance model fit. The simpler TRA model sufficiently reproduces the observed correlations, consequently the TRA constitutes a more parsimonious model when explaining alcohol consumption on game day.

Summary

This chapter contains the findings for the research questions raised in this inquiry, including the results from the descriptive statistics, multiple logistic regression and path analyses. Overall, the sample population matched the UF population with the slight overrepresentation of Caucasian and female students. The descriptive findings revealed that students who are Caucasian, male, Greek, and over the age of 21 engage in ERAC at disproportionately high rates. The results from the logistic regression analyses indicated that each of the TPB constructs were statistically significant in predicting ERAC, although the odds ratio values were modest. Overall, the Behavioral Intention functioned as the strongest predictor of ERAC. Males appeared to be more influenced by the Attitude Toward the Behavior construct, whereas the Perceived Behavioral Control construct was more robust among females. The Subjective Norm construct was predictive with underage participants but not among those of legal drinking age. Finally, the findings from the path analysis demonstrated that, with the exception of the Perceived Behavioral Control (PBC) construct each of the TPB variables in the model were statistically significant. A Chi-square difference test revealed that the TRA represents a more appropriate model than the TPB for explaining alcohol use on game day.

Table 4-1. Participant demographics compared to UF student population fall 2006

Characteristic	UF #	UF %	Game day #	Game day %
Gender				
Male	24,322	47.2	290	39.2
Female	27,195	52.8	450	60.8
Grade				
Freshman	5,636	10.9	151	20.4
Sophomore	7,899	15.3	140	18.9
Junior	10,012	19.4	172	23.2
Senior	11,152	21.6	201	27.2
Graduate/professional/	10,828	21.0	76	10.2
Ethnicity				
Caucasian	33,315	64.7	544	73.6
Hispanic	5,749	11.2	86	11.6
Black/African American	4,092	7.9	46	6.2
Asian/Pacific Islander	3,592	7.0	51	6.9
Amer./Alaskan Native	171	0.3	2	0.3
Others	3,213	6.2	10	1.4
Greek Status				
Member of a fraternity or sorority	5,240	14.0	143	19.4

*Note: Only persons age 18-24 were included in the Game Day Survey sample.

Table 4-2. Chi-square analysis of ERAC rates by gender

Gender	ERAC #	Total #	ERAC %
Male	68	290	23.4
Female	48	450	10.7
Total	116	740	15.7

OR = 2.565, $p < 0.001$, 95% C.I.=1.712, 3.843

Table 4-3. Chi-square analysis of ERAC rates by classification

Classification	ERAC #	Total #	ERAC %
Freshmen	9	151	6.0
Sophomores	15	140	10.7
Juniors	27	172	15.7
Seniors	50	201	24.9
Graduates/Professionals	14	75	18.7
Total	115	739	15.6

$p < 0.001$

Table 4-4. Chi-square analysis of ERAC rates by ethnicity

Ethnicity	ERAC #	Total #	ERAC %
Asian/Pacific Islander	1	51	2.0
Black/African American	1	46	2.2
Hispanic or Latino	13	86	15.1
Caucasian	98	544	18.0
Other	3	12	25.0
Total	116	739	15.7

$p < 0.001$

Table 4-5. Chi-square analysis of ERAC rates by Greek status

Greek status	ERAC #	Total #	ERAC %
Non-Greek	81	597	13.6
Greek	35	143	24.5
Total	116	740	15.7

OR = 2.060, $p < 0.001$, 95% C.I.= 1.317, 3.223

Table 4-6. Chi-square analysis of ERAC rates by legal drinking age

Legal drinking age	ERAC #	Total #	ERAC %
Under 21	40	414	9.7
21 and over	76	324	23.5
Total	116	738	15.7

OR = 2.865, $p < 0.001$, 95% C.I.= 1.892, 4.34

Table 4-7. 5+4+ drinking and ERAC rates by demographic

Demographic	5+4+		ERAC	
	n	Percentage	n	Percentage
Gender				
Male	125	43.1%	68	23.4%
Female	143	31.8%	48	10.7%
Grade classification				
Freshmen	21	13.9%	9	6.0%
Sophomores	42	30.0%	15	10.7%
Juniors	62	36.0%	27	15.7%
Seniors	107	53.2%	50	24.9%
Graduates/professionals	35	46.7%	14	18.7%
Ethnicity				
Asian/Pacific Islander	6	11.8%	1	2.0%
Black/African American	5	10.9%	1	2.2%
Hispanic or Latino	32	37.2%	13	15.1%
Caucasian	221	40.6%	98	18.0%
Other	4	33.3%	3	25.0%
Greek Status				
Non-Greek	201	33.7%	81	13.6%
Greek	67	46.9%	35	24.5%
Legal drinking age				
Under 21	98	23.7%	40	9.7%
21 and over	170	52.5%	76	23.5%
Total	268	36.3%	116	15.7%

Table 4-8. Correlation analysis of direct TPB composite measures and Behavioral Intention

TPB	ATB	SN	PBC	BI
ATB	1.00			
SN	0.509**	1.00		
PBC	0.105**	0.027	1.00	
BI	0.597**	0.652**	0.107*	1.00

* Correlation is significant at the 0.05 level (2-tailed).

** Correlation is significant at the 0.01 level (2-tailed).

Note: ATB = Attitude Toward the Behavior, SN = Subjective Norm, PBC = Perceived Behavioral Control, and BI = Behavioral Intention.

Table 4-9. Logistic regression analysis TPB composite measures—ERAC

Variables in the model	OR (95% CI)	Wald	<i>p</i>
Attitude Toward the Behavior	1.04 (1.01 – 1.08)	5.01	0.025
Subjective Norm	1.02 (1.00 – 1.03)	6.57	0.010
Perceived Behavioral Control	0.97 (0.94 – 1.00)	4.85	0.028
Behavioral Intention	1.40 (1.23 – 1.60)	24.35	<0.001

Model Chi-Square = 156.08, *df* = 4, *p* < 0.001. Total N = 318

Cox and Snell pseudo R^2 = 0.39

Nagelkerke pseudo R^2 = 0.61

Table 4-10. Logistic regression analysis TPB composite measures—ERAC women

Variables in the model	OR (95% CI)	Wald	<i>p</i>
Attitude Toward the Behavior	1.01 (0.96 – 1.07)	0.28	ns
Subjective Norm	1.02 (0.99 – 1.04)	3.01	ns
Perceived Behavioral Control	0.95 (0.91 – .995)	4.67	0.031
Behavioral Intention	1.42 (1.18 – 1.71)	13.93	<0.001

Model Chi-Square = 67.92, *df* = 4, *p* < 0.001. Total N = 195
 Cox and Snell pseudo R^2 = 0.29
 Nagelkerke pseudo R^2 = 0.55

Table 4-11. Logistic regression analysis TPB composite measures—ERAC men

Variables in the model	OR (95% CI)	Wald	<i>p</i>
Attitude Toward the Behavior	1.06 (1.01 – 1.12)	4.67	0.031
Subjective Norm	1.00 (1.00 – 1.04)	3.26	ns
Perceived Behavioral Control	0.98 (0.94 – 1.03)	0.60	ns
Behavioral Intention	1.42 (1.16 – 1.76)	11.01	<0.001

Model Chi-Square = 80.51, *df* = 4, *p* < 0.001. Total N = 123
 Cox and Snell pseudo R^2 = 0.48
 Nagelkerke pseudo R^2 = 0.68

Table 4-12. Logistic Regression Analysis TPB composite measures—ERAC juniors

Variables in the model	OR (95% CI)	Wald	<i>p</i>
Attitude Toward the Behavior	1.04 (0.93 – 1.16)	0.24	ns
Subjective Norm	1.04 (1.01 – 1.08)	4.99	0.025
Perceived Behavioral Control	0.95 (0.86 – 1.04)	1.45	ns
Behavioral Intention	1.41 (1.00 – 1.97)	3.92	0.048

Model Chi-Square = 45.61, *df* = 4, *p* < 0.001. Total N = 78
 Cox and Snell pseudo R^2 = 0.44
 Nagelkerke pseudo R^2 = 0.69

Table 4-13. Logistic regression analysis TPB composite measures—ERAC seniors

Variables in the Model	OR (95% CI)	Wald	<i>p</i>
Attitude Toward the Behavior	1.04 (0.98 – 1.10)	1.56	ns
Subjective Norm	1.01 (0.10 – 1.03)	2.37	ns
Perceived Behavioral Control	1.01 (0.96 – 1.06)	0.26	ns
Behavioral Intention	1.31 (1.05 – 1.63)	5.58	0.018

Model Chi-Square = 44.75, *df* = 4, *p* < 0.001. Total N = 96
 Cox and Snell pseudo R^2 = 0.37
 Nagelkerke pseudo R^2 = 0.53

Table 4-14. Logistic regression analysis TPB composite measures—ERAC graduate and professional students

Variables in the model	OR (95% CI)	Wald	<i>p</i>
Attitude Toward the Behavior	1.00 (0.87 – 1.15)	0.00	ns
Subjective Norm	0.94 (0.10 – 1.07)	0.02	ns
Perceived Behavioral Control	0.91 (0.81 – 1.02)	2.68	ns
Behavioral Intention	2.23 (1.13 – 4.42)	5.32	0.021

Model Chi-Square = 25.33, *df* = 4, *p* < 0.001. Total N = 38
 Cox and Snell pseudo *R*² = 0.49
 Nagelkerke pseudo *R*² = 0.73

Table 4-15. Logistic regression analysis TPB composite measures—ERAC underage drinkers

Variables in the model	OR (95% CI)	Wald	<i>p</i>
Attitude Toward the Behavior	1.06 (1.00 – 1.12)	3.203	ns
Subjective Norm	1.03 (1.01 – 1.05)	5.507	0.018
Perceived Behavioral Control	0.96 (0.91 – 1.01)	2.797	ns
Behavioral Intention	1.37 (1.10 – 1.71)	7.678	0.006

Model Chi-Square = 71.99, *df* = 4, *p* < 0.001. Total N = 158
 Cox and Snell pseudo *R*² = 0.37
 Nagelkerke pseudo *R*² = 0.70

Table 4-16. Logistic regression analysis TPB composite measures—ERAC legal drinking age

Variables in the model	OR (95% CI)	Wald	<i>p</i>
Attitude Toward the Behavior	1.04 (0.99 – 1.09)	2.105	ns
Subjective Norm	1.01 (1.00 – 1.03)	2.040	ns
Perceived Behavioral Control	0.98 (0.94 – 1.02)	1.459	ns
Behavioral Intention	1.41 (1.19 – 1.67)	15.211	<0.001

Model Chi-Square = 74.17, *df* = 4, *p* < 0.001. Total N = 159
 Cox and Snell pseudo *R*² = 0.37
 Nagelkerke pseudo *R*² = 0.54

Table 4-17. Goodness-of-fit measures for TPB composite measures model tests

Model	χ^2	<i>p</i>	<i>df</i>	SRMR	CFI	RFI	RMSEA
TPB	18.352	<0.001	2	0.036	0.972	0.844	0.161

Note: TPB = Theory of Planned Behavior, SRMR = Standardized Root Mean Square Residual, CFI = Comparative Fit Index, RFI = Relative Fit Index, RMSEA = Root Mean Square Error of Approximation.

Table 4-18. Standardized effects on Behavioral Intention and number of drinks consumed on game day

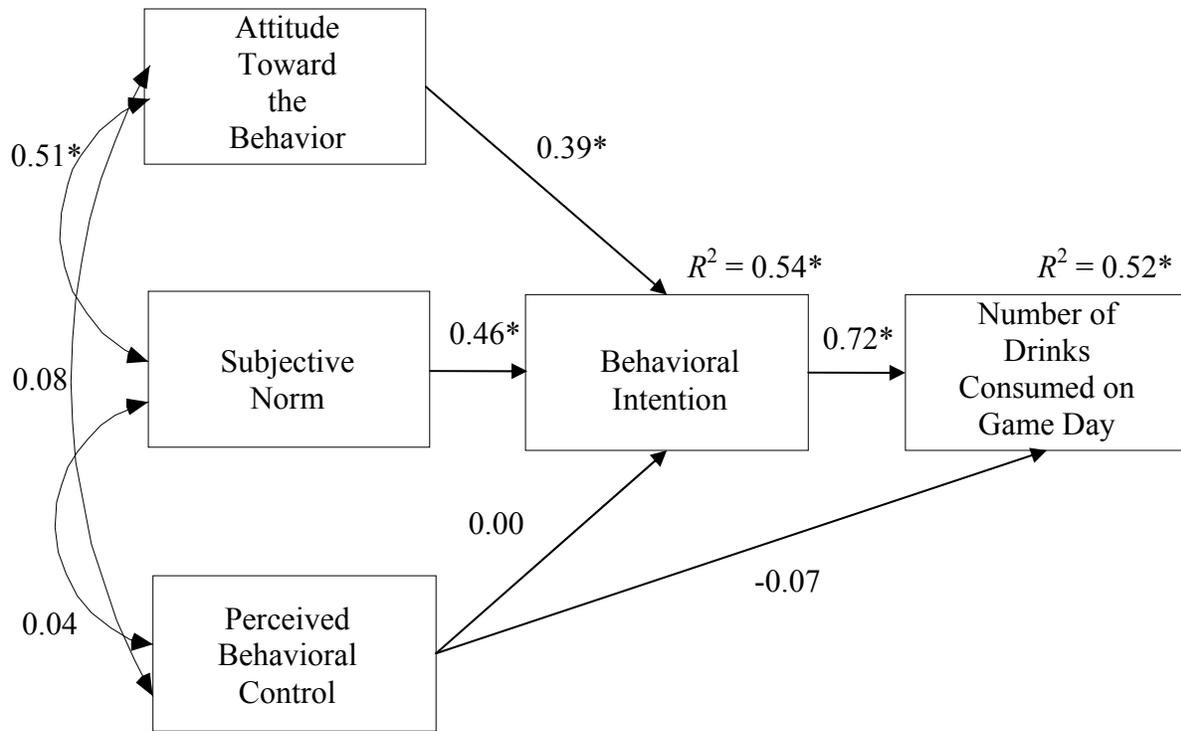
Effect	<i>r</i>	Direct	Indirect	Total	Correlation
On BI					Unspecified Correlation
Of ATB	0.619**	0.386***	0.000 ^a	0.386***	0.233
Of SN	0.654**	0.458***	0.000 ^a	0.458***	0.196
Of PBC	0.049	0.002	0.000 ^a	0.002	0.047
On # drinks					Spurious Correlation
Of ATB	0.543**	0.000 ^a	0.278***	0.278***	0.265
Of SN	0.560**	0.000 ^a	0.330***	0.330***	0.230
Of PBC	-0.031	-0.066	0.001	-0.065	-0.034
Of BI	0.717**	0.720***	0.000 ^a	0.720***	-0.003

Notes: a – effect is 0.000 due to prespecified constraint; ** $p < 0.01$; *** $p < 0.001$. BI = Behavioral Intention, ATB = Attitude Toward the Behavior, SN = Subjective Norm, PBC = Perceived Behavioral Control.

Table 4-19. Goodness-of-fit measures for TRA composite measures model tests

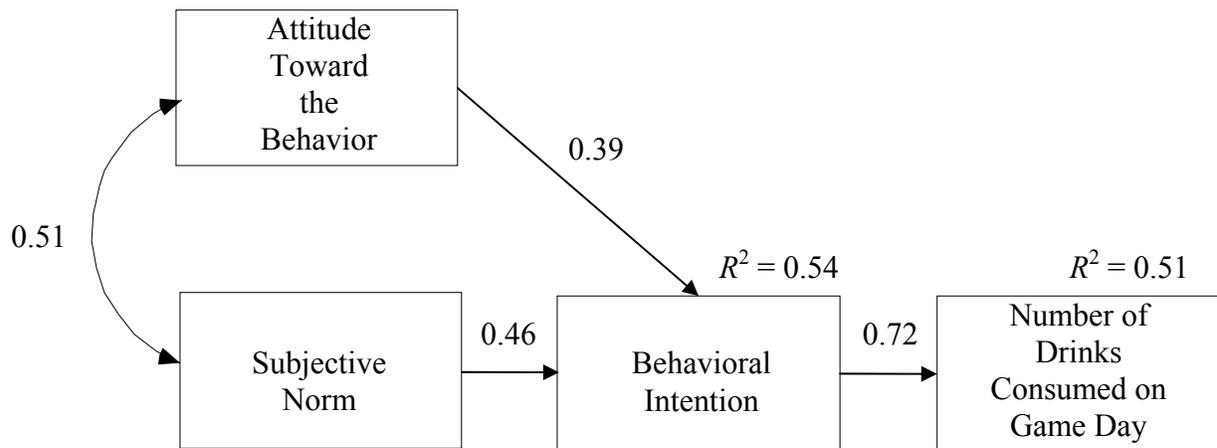
Model	χ^2	<i>p</i>	<i>df</i>	SRMR	CFI	RFI	RMSEA
TPB	17.419	<0.001	2	0.043	0.973	0.910	0.156

Note: TRA = Theory of Reasoned Action; SRMR = Standardized Root Mean Square Residual; CFI = Comparative Fit Index; RFI = Relative Fit Index; RMSEA = Root Mean Square Error of Approximation.



* statistically significant at $p < 0.001$ alpha level.

Figure 4-1. Path analysis from TPB composite measures



All statistically significant at $p < 0.001$ alpha level.

Figure 4-2. Path analysis from TRA composite measures

CHAPTER 5 SUMMARY, DISCUSSION, IMPLICATIONS, CONCLUSIONS

Summary

This chapter provides a summary of the study purpose, methods, and results, as well as discussion, implications, and conclusions. The implications incorporate recommendations for future research, prevention strategies, and social marketing practices.

This inquiry examined college student alcohol consumption on “game day,” which includes drinking that occurs before, during, and after the game, both on or off campus. While the literature encompasses considerable research on college students and 5+4+ drinking, a dearth of information exists on game day drinking behaviors. The goal of this exploratory research was to utilize the Theory of Planned Behavior (TPB) to gain a better understanding of the motivational factors associated with college student alcohol consumption on game day in an attempt to guide future prevention efforts. Specifically, the purposes of this research were to (a) assess the rates of “Extreme Ritualistic Alcohol Consumption” (ERAC) among college students; (b) test the effectiveness of the Theory of Planned Behavior (TPB) in predicting ERAC rates; and (c) determine which, if any, of the TPB constructs to utilize when designing interventions to decrease ERAC by college students.

This investigation incorporated a cross-sectional survey design with randomly selected participants. The Game Day Survey instrument used in this study was modified and adapted from previous research by Haun and colleagues (2007). TPB items were added to the Game Day Survey based on information obtained from a review of the professional literature. Survey content validity was established through review by an expert panel, including University of Florida professionals in college health promotion and student affairs, an alcohol and drug researcher, and a Distinguished Professor in the College of Pharmacy. The feedback from this

panel resulted in the minor modification of certain survey items. The Cronbach's alpha and test-retest values indicate that the Game Day Survey is a reliable instrument.

The study population included approximately 51,520 UF students enrolled for classes during the 2006 fall semester. A randomly selected list of e-mail addresses for 2,083 students ages 18-24 was provided by the Registrar. The Game Day Survey was administered electronically on November 20, 2006, the Monday after the final home football game of the season. The last possible date for students to complete the survey was December 18, 2006. During the four-week study duration three reminders were sent to participants. A total of 740 students responded to the anonymous electronic survey, yielding a response rate of 36%. Overall, the sample matched the student population with the exception of a slight overrepresentation of females and Caucasians.

The study was designed to answer the following research questions:

- What is the prevalence of Extreme Ritualistic Alcohol Consumption on a typical game day for fall 2006?
- How much variance does the combination of constructs in the Theory of Planned Behavior explain when predicting Extreme Ritualistic Alcohol Consumption on game day?
- Which constructs within the Theory of Planned Behavior (Subjective Norm, Attitude Toward the Behavior, Perceived Behavioral Control, and Behavioral Intention) account for the largest proportion of variance when predicting Extreme Ritualistic Alcohol Consumption behavior among college students on game day?
- Do the constructs within the Theory of Planned Behavior differ by gender when predicting Extreme Ritualistic Alcohol Consumption among college students on game day?
- Do the constructs within the Theory of Planned Behavior differ by grade classification when predicting Extreme Ritualistic Alcohol Consumption among college students on game day?
- What are the causal effects in predicting alcohol consumption rates using the constructs from the TPB?

Inferential statistics were used to examine the rate of ERAC on game day and to assess how this behavior differs by various demographics. Multiple logistic regression analyses were conducted to determine the amount of variance TPB contributed when used to predict ERAC. Multiple logistic regression analysis yielded odds ratios revealing which of the TPB constructs were most influential in predicting ERAC. Separate multiple logistic regression analyses were conducted to ascertain differences influenced by gender, grade classification, and the legal drinking age when predicting ERAC. Path analysis was utilized to determine if the TPB provided a valid framework for explaining alcohol consumption on game day.

The results from the multiple logistic regression analyses revealed that the TPB model correctly classified 88.7% of the cases. While each of the TPB constructs was statistically significant, Behavioral Intention was the strongest predictor of ERAC. The findings indicated that the construct Attitude Toward the Behavior was predictive of ERAC with males, whereas the construct Perceived Behavioral Control was the strongest predictor among females. The differences in predicting ERAC among grade classifications were minimal, but noteworthy distinctions existed based on legal drinking age. Among underage students the Subjective Norm construct was useful in predicting ERAC, but not among college students 21 and older. The path analysis revealed that, with the exception of Perceived Behavioral Control, each of the TPB constructs contributed significant explanatory power in predicting intention and behavior. Based on the results of this study, the original Theory of Reasoned Action constitutes a more efficacious model for explaining drinking on game day than the more complex TPB, because TRA does not include the PBC construct. Nevertheless, additional research utilizing the PBC construct is needed before definitive conclusions can be made concerning the TPB's applicability in this area.

Limitations

This study contains several limitations. First, self-reported data may include recall bias (Portney & Watkins, 2000). Participants do not always report their behaviors or respond to questions accurately. Some participants may be inclined to over-or underreport their behaviors, especially when answering sensitive questions. For example, respondents may be reluctant to admit driving under the influence or people may exaggerate how much alcohol they drank. Further, underage participants may be reluctant to divulge any information which they fear could lead to legal repercussions with the police or university, and may intentionally misrepresent their age or fail to acknowledge their drinking behaviors. In other situations participants simply cannot recall their drinking behavior correctly. Intoxicated individuals may not be able to remember certain segments of their drinking experience, let alone remember precisely how many drinks they consumed. Nevertheless, self-reported data constitute a valid and common method for collecting health information, especially when measures are taken to ensure anonymity (Brener et al., 2003; Cooper, Sobell MB, Sobell LC, & Maisto, 1981; Midanik, 1988).

The 36% response rate obtained for this survey merits serious consideration when interpreting the results from this study. While the sample matched the overall student population with the exception of a slight overrepresentation of females and Caucasians, resource limitations precluded the ability to document whether nonrespondents would have answered the survey questions differently. Heavy drinkers may have been less likely to respond to an alcohol questionnaire, because this group may be less responsible and compliant than others (Cottler, Robins, & Spitznagel, 1987; Knibbe, 1984 as cited by Lemmens et al., 1988; Wild, Cunningham, & Adlaf, 2001). This would result in the under-reporting of ERAC and 5+4+ drinking rates. Heavy drinkers may respond differently to the various survey items, thus skewing the pseudo R^2

values (Cox & Snell, and Nagelkerke statistics specific to multiple logistic regression), the odds ratio scores, and the path coefficient values. Conversely, nonsports fans and abstainers may have chosen not to participate in the study because they are not concerned with college football and their experiences with alcohol are limited. Therefore, they may not be interested in the survey nor appreciate the relevance of their responses (Lahaut, Jansen, Mheen & Garretsen, 2002). However, because the participants were randomly selected to participate in the survey, the response bias should be minimal (Alreck & Settle, 1995).

The response rate may have been compromised by e-mail default mechanisms. For example, sometimes mass e-mails go directly into a recipient's "junk mail" folder. With over 2000 e-mails sent out for this study, it is likely that some participants did not check their "junk mail" folders and were unaware of their opportunity to participate in the study. Nonetheless, the response rate reported in this study is similar to that obtained in other alcohol related web-based surveys (Bormann & Stone, 2001, Glassman et al., 2007).

The large sample size may have contributed to committing a Type II error, whereby some analyses appear to be statistically significant, but they may not have been if a smaller sample had been selected. For example, the goodness-of-fit Chi-square procedure ($n=316$) yielded a statistically significant result suggesting poor model fit. However, when conducting a path analysis with a large sample, it is not uncommon for the Chi-square goodness-of-fit measure to be statistically significant, because the test is very sensitive to sample size (Kline, 1998).

Further, the count data used for the endogenous variable (number drinks consumed on game day) resulted in a substantial number of abstainers and low-end drinkers, creating a positively skewed distribution, which may have contributed to the high Root Mean Square Error of Approximation value. The high RMSEA value warrants caution when interpreting the results

from the path analysis. However, these goodness-of-fit measures may vary from acceptable to unacceptable depending on the index used (Hair, et al., 2006). For these reasons, as is standard practice when conducting a path analysis, multiple goodness-of-fit measures were utilized, which allow the reader to assess the strengths and weaknesses of the analysis

This sample was drawn from the University of Florida, a large public university in the southeastern United States. Because of regional differences, drinking patterns found in this study may not be representative of those at other universities. For example, the rates of 5+4+ drinking tend to be the highest at colleges and universities located in the Northeast (Presley et al., 2002). In addition, drinking rates change over time and are related to variables such as the football team's schedule (opponent), the time of day the games are played, the team's ranking, the school's football conference, the school's football history, and the weather. To improve external validity, researchers should conduct a needs assessment among randomly selected US universities with football programs, in order to determine the national rate of 5+4+ and ERAC drinking on game day.

The cross-sectional design employed for this study limits inferences concerning causality. It is not possible to assess whether TPB constructs (alcohol beliefs, attitudes, norms, and perceived control) lead to ERAC, or whether previous drinking experiences influence TPB constructs. Causal relationships can only be established by using an experimental design (Cottrell & McKenzie, 2005).

Another study limitation involves the high rates of missing data in this investigation. For example, only about 50% of the data received from the 740 participants could be used for the multiple regression analyses due to the listwise exclusion of cases (respondents). Therefore, any missing response to the relevant question(s) caused the entire case to be removed from the

analysis. This issue was particularly problematic with the composite scales. Additionally, items with a “nonapplicable” response were also coded as missing. The Normative Belief and Motivation to Comply scales included items concerning the approval or compliance with a “significant other’s” opinion on game day drinking. Because they were currently without a significant other, nearly a third of the sample participants indicated the “not applicable” response to these items. The use of this response option by such a large portion of the sample contributed to the high rates of missing data. No adjustments were made to account for the missing data. Consequently, it is impossible to determine the influence of the missing data on the logistic regression analyses. Missing data represents a common problem in multivariate analysis (Beale & Little, 1975). However, all of the logistic regression analyses in the present study included large numbers of participants, thereby increasing the reliability of the findings. Nevertheless, caution should be used when interpreting these results.

Finally, the reliability measures, which consisted of a test-retest and internal consistency analyses revealed, limitations with certain items. For example, the Cronbach’s alpha scores for the Behavioral Beliefs and Evaluations of Behavioral Outcomes scales were 0.559 and 0.685, respectively, indicating only moderate reliability. Table 3-16 illustrates the Cronbach’s alpha value for several of the survey scales would improve if certain items which had low Cronbach’s alpha items were removed from the analysis. In addition, the test-retest results for Perceived Behavioral Control ranged from 0.85 to 0.54 with an average of 0.68, indicating modest stability over time. Thus, the findings from this investigation need to be interpreted with caution due to the moderate, but acceptable reliability scores among certain items.

Discussion

Despite these limitations, the results of this study reveal important information that increases our understanding of alcohol use among college students, particularly within a ritualized context. Game day signifies a distinct social experience, in which tens of thousands of fans come to campus to watch football. For some, the event comprises a major opportunity to imbibe alcoholic beverages, which may include drinking before, during, and after the game. Indeed, roughly half of the sample population in this study indicated that they typically drank on game day, with the average time spent drinking equaling nearly four hours. In addition, students who reported drinking on game day each consumed an average of approximately seven alcoholic drinks.

In an effort to describe the unique drinking patterns which occur on game day, a customized term, “Extreme Ritualistic Alcohol Consumption” (ERAC) was created for this investigation. ERAC based on the measure White and colleagues created (2006), is defined as consumption of 10 or more drinks on game day for a male, and eight or more drinks for a female. This differs from the conventional 5+4+ drinking measure, meaning five or more drinks by a male, four or more drinks by a female in one sitting (Wechsler et al, 2002). While the latter is helpful in identifying unsafe drinking practices, it fails to provide a clear indication of how heavily people actually drink (White et al., 2006). Given the unique circumstances associated with game day drinking, the ERAC measure may better assist health advocates and school officials in assessing the extent of high-volume alcohol consumption on game day.

Approximately 16% of the sample population reported engaging in ERAC on game day, with males participating in this behavior at more than twice the rate of females. Not surprisingly, the 5+4+ drinking rates follow a similar pattern. Nearly two out of every five students engaged in

5+4+ drinking on game day, with females drinking at substantially lower rates than males. These drinking trends are consistent with the literature (NIAAA, 2004b; UF Biennial Review, 2006; Wechsler, et al., 2002), which indicates that males typically consume more alcohol than females.

The racial/ethnic drinking patterns among participants in this study also affirm the literature on college students and alcohol consumption (Wechsler et al., 2002). Caucasians in the sample population drank at considerably higher rates than other races or ethnicities. Approximately two-fifths of Caucasians in this study consumed 5+4+ drinks, while one-fifth engaged in ERAC. Hispanics reported drinking at the second highest rates followed by African Americans and Asians, respectively. In summary, while no racial group or gender should be ignored, the need to target male Caucasians with alcohol interventions remains a public health priority on college campuses.

The results of this study also justify creating specific initiatives for the Greek (social fraternities and sororities) community. Within the sample of students in this study, approximately one-quarter of the Greek population (students in a social fraternity or sorority) engaged in ERAC on game day. Greeks were almost twice as likely to engage in ERAC on game day as non-Greeks. Further, nearly half of Greeks (46.9%) engaged in 5+4+ drinking, whereas approximately one-third (33.7%) of non-Greeks reported taking part in this behavior on game day.

When analyzed by grade classification, the rates of 5+4+ and ERAC both increase with undergraduate grade classification. Additionally, graduate/professional students engaged in ERAC on game day at rates higher than those of freshmen, sophomores, and juniors, and at rates similar to those of seniors. A similar pattern existed with 5+4+ drinking on game day, which

indicates an unusual finding. Previous research reveals that graduate/professional students drink substantially *less* than undergraduates and that upperclassman tend to “mature” and don’t drink as much as underclassman (Marlett, Baer, Kivlahan, Dimeff, Larimer, Quigley, Somers, & Williams, 1998; Wechsler, et al., 2002).

Similarly, these results reveal that older students drink at higher rates on game day than do younger students. Nearly a quarter of the students ages 21 and over engaged in ERAC on game day compared to less than one-tenth of those under the legal drinking age. Students legally permitted to drink alcohol were almost three times more likely to drink on game day than students under the age of 21. Perhaps the minimum drinking age law is serving as a deterrent or a protective factor on game day among students under the age of 21. Haun and colleagues (2007), attribute lower rates of 5+4+ drinking on game day among underage students to increased vigilance by police, bar/restaurant owners, school officials, and others. Conversely, underage participants may be unwilling to disclose any information which they fear would lead to legal consequences. As a result, these students may lie about their ages or not admit to consuming alcohol, leading to under-reported underage drinking statistics.

The multivariate analyses conducted in this study provided additional insight. The odds ratios revealed that, while each of the TPB constructs was statistically significant at the 0.05 alpha level, only Behavioral Intention predicted ERAC at a level sufficient to influence intervention design. The modest odds ratios for engaging in ERAC among the constructs Attitude Toward the Behavior, Perceived Behavioral Control, and Subjective Norm were 1.04, 1.03, and 1.02, respectively, whereas the odds ratio for Behavioral Intention was 1.40. A one unit change in the Behavioral Intention score was associated with a 40% increase in the odds of engaging in ERAC, whereas the other TPB constructs each elicited less than a 5% increase,

respectively. In summary, the odds ratio values for the composite measures were too small, in practical terms, to make programmatic decisions. Additional research is needed to expand our understanding of how the TPB can be utilized to explain alcohol use and abuse, especially as it relates to game day drinking.

Another purpose of this investigation was to assess gender differences when utilizing the TPB to predict ERAC. Separate multiple logistic regression analyses were conducted with females and males to determine the extent to which gender influences ERAC. Behavioral Intention was the strongest predictor variable with both groups, while the Subjective Norm was not statistically significant with either gender. Thus, based on the findings from this study, both males and females are likely to benefit from Behavioral Intention interventions, whereas neither gender's ERAC rates are apt to decrease from norms-related initiatives.

Consistent with the findings of Wall and colleagues (1998), Perceived Behavioral Control was statistically significant for females, but not for males. For females, the likelihood of excessive drinking increases as the perceived control decreases. Males, conversely, appear not to be influenced by this psychosocial factor. The authors concluded that females' appraisal of the amount of control they have over their alcohol consumption is more accurate than that of their male counterparts (Wall et al., 1998). Females may be more aware or likely to acknowledge the limits of their control than men especially as it relates to alcohol use. Males may perceive that it is not masculine to acknowledge their limits or lack of control.

Attitude Toward the Behavior was found to be statistically significant among males, but not among females. This finding conflicts with the study by Johnson and colleagues (2006) which found that college-aged females who held favorable attitudes toward alcohol were more likely to drink excessively. However, their study only included undergraduate female students

from Australia. Thus, these findings may not be applicable in the United States, especially relating to game day drinking. Nevertheless, the findings from this study confirms previous research indicating the efficacy of challenging student alcohol expectancies (Wall et al., 1998; NIAAA, 2002b), and warrants the development of intervention strategies designed to reduce alcohol consumption among male college students on game day.

While the multiple logistic regression results showed minimal differences based on grade classification, an additional analysis on the legal drinking age variable revealed that TPB was slightly more effective in predicting ERAC among underage participants than those of legal age. Behavioral Intention was predictive of ERAC for both underage students and those of legal drinking age, but the Subjective Norm construct was statistically significant only among underage participants. None of the other TPB constructs was significant with either group. These findings indicate that ERAC among college students who are underage is motivated, in part, by the approval or disapproval of key referents. Thus, designing a social norm intervention targeting underage students has merit.

The results of the path analysis indicate that the original Theory of Reasoned Action (TRA) model may provide a better model than its extension, the Theory of Planned Behavior (TPB), for explaining alcohol consumption on game day. The Perceived Behavioral Control construct was not predictive of Behavioral Intention or self-reported drinking behavior on game day, as the TPB model suggests. Nevertheless, Behavioral Intention to get drunk on game day predicted drinking behavior. Intentions, in turn, were predicted by Attitude Toward the Behavior and Subjective Norm constructs.

These findings are consistent with the research of O'Callaghan and colleagues (1997), who found that Perceived Behavioral Control (PBC) was not predictive of college students'

intentions to drink alcohol or of their drinking behavior. The authors speculated that because most of the participants in their study were non-problem drinkers, they experienced high perceived control over their drinking. Thus while a substantial percentage of their sample intended to drink alcohol, they perceived their alcohol consumption to be within their control. This may explain why the PBC failed to elicit a significant influence in their research or in the present study. The TPB may be less applicable in alcohol research with college students for these reasons, than other behavioral theories.

The items used to assess the PBC construct may provide another potential explanation for its lack of statistical significance in the current study. A composite measure of the indirect constructs Control Beliefs and Perceived Power was used to create the PBC scale. Control Beliefs are designed to assess “the presence or absence of facilitators and barriers to behavioral performance weighted by the Perceived Power or impact of each factor to facilitate or inhibit the behavior” (Glanz et al., 2002 pg. 75). While the items were constructed on the basis of the literature and were reviewed by experts, these sub-scales require refinement. The Control Belief items utilized in the current study assessed how often respondents participated in the behavior, but they did not measure the participants’ perceptions of the likelihood of performing the behavior. For example, one of the Control Belief items asked how often participants “Are given free alcoholic drinks on game day?” with “always” to “never” response options. The item could improve from a theoretical standpoint by assessing the perceived likelihood of the facilitating or constraining condition. An alternative version to this item is, “How likely is it that you will be offered free alcoholic drinks on game day?” with “likely” to “unlikely” response options.

The Perceived Power items assessed the likelihood of performing a behavior rather than the perceived ease or difficulty of engaging in the behavior. For example, one of the Perceived

Power items on the Game Day Survey asked if “People offering me free alcoholic drinks influence my decision to get drunk on game day” with “extremely likely,” and “extremely unlikely” as response options. This item would be more consistent with the TPB if it were reworded as follows: “Receiving free alcoholic drinks makes getting drunk on game day:” with response options varying from “easy” to “difficult.” Poor theoretical fidelity with the design of the Control Belief and Perceived Power items may help to explain why the PBC construct failed to elicit a statistically significant value.

Accurately assessing the PBC construct remains a challenge for researchers. A meta-analysis revealed that only a limited number of studies demonstrated a significant relationship between PBC and Behavioral Intention (Ajzen, 1991). In the current study the PBC construct was statistically significant in the multiple logistic regression analyses when all of the TPB variables, including Behavioral Intention, were treated equally as independent variables. However, PBC was not statistically significant in the path analysis when Behavioral Intention served as a mediating variable between the dependent variable alcohol consumption and the TPB composite measures. Thus, as Reinecke, Schmidt, and Ajzen (1996) found, controlling for Behavioral Intention weakens the statistical support for the PBC construct. Consequently, the results of the logistic regression analyses should be interpreted with caution.

Interpreting the findings from this investigation requires theoretical considerations as well. A weakness of the TPB is the underlying assumption that behavior follows a linear course of action. However, behavior optimizes a dynamic, extremely complex phenomenon (Glanz et al., 2002). Certain predictive factors are not included. For example, TPB does not address past behavior, which serves as a strong predictor of alcohol use among college students (O’Callaghan et al., 1997). One’s attitude toward drinking may be based more on past drinking experiences

than on future expectations concerning alcohol use. Perhaps it is more likely that one's past alcohol use creates the foundation for future alcohol expectancies. A similar pattern emerges with the construct Perceived Behavioral Control. One's previous performance of a behavior likely influences perception of personal control over the behavior, unlike the notion that Perceived Behavioral Control merely influences behavioral intention and behavior (Kashima, Gallois, & McCamish, 1993).

Behavioral Intentions may change or evolve as students drink on game day. For instance, a student may intend to drink in moderation on game day, but as the individual consumes more and more alcohol, situational cues for behavior become more salient. The pleasure of the drug, the excitement of the game, and the immediate influence of one's peers may shift the individual's Behavioral Intentions and, as a result, the behavior changes as well. A respondent's attitude, perceived acceptance of drinking, control of alcohol use, and intentions may fluctuate throughout the drinking encounter. In short, beliefs and attitudes are likely to shift before, during, and after the drinking experience. The present study, based on a simple linear model, measures the causal sequence after the entire episode, and thus fails to address potential fluctuations in attitudes, beliefs, and behavior. Obtaining such information would shed additional insight into the complex and dynamic factors which influence behavior.

Finally, while the TPB allows researchers to measure systematically the role of factors perceived by respondents to be salient in their intentions and behaviors, it does not necessarily mean those perceptions are accurate. Cognitive biases among participants may result in an under- or overestimation of what truly motivates their behavior (Alreck & Settle, 1995). For example, several key external factors may influence alcohol use on game day. The presence of law enforcement, the cost of alcohol, and the opportunity to tailgate may all impact behavior much

more than respondents realize or are willing to admit. Creating interventions designed to change behavior based on respondents' perceptions may not be optimally effective. While the Game Day Survey included items which measured participants' perceptions, future studies should include an objective environmental assessment that more accurately measures the external influences mentioned above.

Implications

The Game Day Survey was conducted to describe Extreme Ritualistic Alcohol Consumption patterns among college students using the Theory of Planned Behavior as a guiding framework. The findings provide important implications addressing the scope of alcohol use and abuse on game day among college students at the University of Florida.

Alcohol consumption is a common occurrence on game day, with approximately half of the sample population reporting that they typically drink on game day. Further, 36% and 16% of those surveyed engaged in 5+4+ drinking and ERAC, respectively. Given the large number of students who attend college football games at the University of Florida, game day drinking represents a significant public health concern. The alcohol related consequences which accompany game day drinking include DUI, fights, encounters with the police, hangovers, vomiting, black outs, sexual assaults, and injury.

While the relationships among the variables in the TRA/TPB vary depending on the sample and behavior of interest (Trafimow, 1996; O'Callaghan et al., 1997; Johnson & White, 2004), the model effectively isolates variables likely to influence a person's motivation to drink (Budd et al., 1984). As far as game day drinking is concerned, the findings from this investigation further validate the Theory of Reasoned Action. The applicability of its extension the Theory of Planned Behavior, the model employed in this study, remains in question.

Nonetheless, the results from this study provide a useful model for explaining alcohol consumption among college students on game day. The model demonstrates a considerable degree of success in predicting alcohol consumption, and in predicting Behavioral Intention in particular. Thus prevention efforts should (a) focus on persuading students to set limits for themselves concerning their alcohol consumption on game day, (b) create attitudes and beliefs which are inconsistent with excessive alcohol consumption, and (c) highlight peer disapproval of inappropriate drinking behavior.

Recommendations

Future Research

Recommendations for future research include the following:

- Administer the Game Day Survey using revised Perceived Behavioral Control (PBC) items to better assess if the insignificant PBC results were a function of theoretical underpinnings or psychometric error. In addition, determine whether the TPB composite measures are more effective in predicting alcohol use among college students on game day than the original direct measures.
- Replicate this study utilizing a time series or longitudinal design. The present study was cross-sectional; thus, inferences about causality cannot be determined. In addition, a number of variables may influence game day drinking, such as the time the game is held, the opponent, the win-loss records of the home team and the opponent, rivalry between teams, etc. Studying these patterns may provide insight into the scope of the problem as well as future prevention efforts. A longitudinal study design requires a substantial incentive for the participants. A time-series method utilizing different samples may represent a realistic research design to address this issue.
- Conduct qualitative research with college students regarding their drinking behavior on game day. Information concerning what differentiates game day drinking from normal drinking activities is lacking. In addition, collecting information from students on motivating factors which may moderate their drinking on game day is an essential step in designing prevention messages.
- In the present study approximately half of the sample reported abstaining from alcohol use on a typical game day. This led to a zero-inflated positively skewed distribution for the responses to this item. In addition, abstainers, social drinkers, 5+4+ drinkers, and those who engage in ERAC may have unique motivations regarding alcohol use. Conducting a discriminant analysis categorizing participants based on their alcohol use

on game day would address distributional concerns while providing insights on how to tailor intervention design to each of these groups.

- Replicate this study and examine the rates of alcohol related consequences of 5+4+ drinkers compared to those who engage in ERAC. The more people drink the more likely they are to experience alcohol related consequences. The results from this research may provide further justification for utilizing the ERAC measure if the rate of consequences differs considerably between the two groups.
- Administer the Game Day Survey utilizing the Expectancy Theory as a guiding framework. The males in this investigation appeared to be most influenced by the TPB construct Attitude Toward the Behavior. This construct is very similar to the Expectancy Theory found in the Social Cognitive Theory (Bandura, 1977). The NIAAA's (2002d) *Call to Action: Changing the Culture of Drinking at U.S. Colleges* lists "Challenging Alcohol Expectancies" as an effective strategy in reducing alcohol use among college students. Modifying the Expectancy Theory scale to match game day drinking expectancies may shed unique insights into the development of prevention messages and the design of other relevant interventions. Assessing how males and females respond to this construct may benefit practitioners as well.
- Conduct research on game day utilizing breathalyzers to collect Blood Alcohol Concentrations (BAC). Due to the inherent limitations of self-reported responses, acquisition of more objective data represents a research priority. Further, collecting BAC measures during tailgating activities on campus before, during, and after the game may provide school officials with the justification needed to implement policy changes such as restricting the time and location parameters associated with tailgating.
- Examine the drinking behaviors of alumni, visitors, and other football fans who are not college students. The UF's football stadium seats approximately 85,000 fans, many of whom are not current UF college students. Special interventions need to be designed, implemented, and evaluated for these groups particularly alumni, whose actions may be emulated by impressionable undergraduates.

Practice

Recommendations for practice include the following:

- Implement a social marketing campaign that focuses on specific TRA constructs while segmenting the audience based on gender and legal drinking status.
 - To address the Behavioral Intention construct all demographic groups may benefit from messages which encourage fans to think in advance about, and to set limits on, how much alcohol they will drink on game day.
 - Utilize the Attitude Toward the Behavior construct to design messages targeting males. Challenging alcohol related expectancies, such as needing to drink in order

to have fun on game day, be more social, and enjoy the game, is fundamental to changing attitudes towards alcohol.

- The Subjective Norm construct should be used to develop messages targeting underage drinkers. Creating a message highlighting the fact that approximately half of the student population does not drink on game day merits consideration. Another possibility is to produce a message stating that one's current or future partner would disapprove of his or her significant other overindulging on game day.
- While more research is needed, targeting females with messages which address the Perceived Behavioral Control construct shows some promise. Addressing the facilitating or constraining issues related to alcohol, such as the financial costs associated with alcohol, the negative physical effects (hangover), the presence of police on game day, etc., may help motivate females to reduce their alcohol consumption.
- Students who engage in ERAC may meet the Diagnostic and Statistical Manual of Mental Disorders, 4th Edition criteria for alcohol abuse or alcohol dependency. Screening students for this behavior provides mental health professionals with data to determine the types of treatment that will best serve these individuals. Students who are transported to the emergency room for the alcohol associated complications or who violate state, local, or campus alcohol related policies constitute obvious intervention priorities.
- There is a variety of environmental strategies which, if implemented, may reduce ERAC. One option is to limit the number of tailgating hours permitted before and after the game, thereby reducing access to alcohol on game day. Another possibility is to designate certain areas on campus where alcohol would be permitted. Over time these locations could become fewer in number and smaller in area. Conversely, certain areas on campus should provide tailgating alternatives that do not permit alcohol use. Ideally, the University could designate sites on campus where students and other fans could tailgate (watch "pre-game" shows) within an alcohol-free venue.
- Enforcement of existing alcohol laws constitutes a fundamental step in reducing alcohol consumption on game day. Currently, it is illegal in the City of Gainesville to have an open container in any public area, including the UF campus on game day. However, perceived and real pressure from alumni, students, and other fans makes it difficult to address this issue. Furthermore, inadequate resources, including the limited number of law enforcement officers available on game day, add to the enforcement problem. Nevertheless, the findings from this study on public health and safety issues related to ERAC clearly warrant the need for more effective enforcement on game day.

Conclusion

This study contributes to the limited body of research concerning college student drinking patterns on game day. ERAC represents a unique concept, based on the measure White

and Colleagues (2006) created to classify the excessive drinking behaviors which occur on ritualized occasions, such as football game day. Assessing drinking rates by specific levels of consumption provides a fundamental step in monitoring the drinking behaviors of college students. Historically, prevention efforts divide those who engage in 5+4+ drinking (consumption of five or more drinks in one sitting, four or more for a female) from those who do not. However, the prevention needs concerning abstainers, social drinkers, 5+4+ drinkers, and those who engage in ERAC undoubtedly vary. The complexities associated with alcohol research cannot be overstated. Time, setting, and context merit special consideration when assessing alcohol usage. For example, students may drink more at a night game than a day game; certain stadiums may be more renowned for their tailgating rituals than others; and certain events such as bowl or championship games may result in increased drinking. Regardless of the circumstances, students who engage in ERAC are at high risk for adverse alcohol-related consequences. Customized prevention, screening, and treatment plans need to be designed for this group. Further research is needed to expand our understanding of this unique public health challenge.

To date, this is the first study to utilize a health behavior theory to examine game day drinking. The findings from this investigation further validate the original TRA's usefulness as a health behavior theory, while leaving in question the applicability of its extension, the TPB. With the exception of Perceived Behavioral Control, each of the constructs served as a significant predictor of either Behavioral Intention or Behavior. Additional research with more effective PBC measures is needed before definitive statements can be made concerning the TPB's applicability in predicting college student alcohol consumption on game day. The TRA's demonstrated parsimony and utility warrant its consideration when developing game day

interventions. The results suggest that the college population should be segmented based on the TRA's theoretical underpinnings, and that each of the constructs be utilized to meet the unique prevention needs of a particular group.

The results from this study provide the necessary justification for creating interventions to address alcohol use on game day. Decreasing 5+4+ drinking among college students represents a prominent health goal in *Healthy Campus 2010*. The specific objective is to reduce the 5+4+ drinking rate to 20% or lower by the end of the decade. Reducing alcohol consumption on game day may help universities lower their overall 5+4+ drinking rates, especially during the fall semester. Suggestions for reducing 5+4+ drinking and ERAC on game day include alcohol-free game day alternatives, increased enforcement of underage drinking, designation of tailgating areas which clearly delineate where alcohol consumption is legal, limitation of the number of tailgating hours, and implementation of social marketing messages to discourage excessive drinking. Universities need to implement and evaluate these and other game day interventions, and additional studies need to be conducted to determine their relative effectiveness.

APPENDIX A
UF GAME DAY SURVEY

The University of Florida is interested in the social and personal activities in which our football fans engage on “Game Day.” Please take about 15 minutes to complete this brief (37 questions) and anonymous survey. Your participation and honest answers are greatly appreciated. Go Gators!

1. Which football games did you attend in 2006?
 - UF vs. Southern Miss on Saturday, September 2, 2006
 - UF vs. Central Florida on Saturday, September 9, 2006
 - UF vs. Kentucky on Saturday, September 23, 2006
 - UF vs. Alabama on Saturday, September 30, 2006
 - UF vs. Louisiana State on Saturday, October 7, 2006 (Homecoming)
 - UF vs. South Carolina on Saturday, November 11, 2006
 - UF vs. Western Carolina on Saturday, November 18, 2006
 - Didn't attend any home football games this season

2. What is your sex?
 - Male
 - Female

3. What is your classification?
 - Freshman
 - Sophomore
 - Junior
 - Senior
 - Graduate Student/Professional
 - Other (please specify)

4. How do you describe yourself?
 - American Indian/Alaskan Native
 - Asian or Pacific Islander
 - Black (non Hispanic)
 - Hispanic or Latino
 - White (non Hispanic)
 - Other (please specify)

5. Are you currently a member of a Greek fraternity or sorority (IFC, NPHC, PC, MGC)?

Yes

No

6. How old are you?

7. How much do you weigh (in pounds)?

Game Day Public Relations

Please select the most appropriate response for the following questions.

8. Since the beginning of the fall 2006 school year, please indicate if you have seen the following:

	Yes	No
Ad in the "Alligator" with Coach Meyer's picture encouraging Gators to be responsible fans?	<input type="radio"/>	<input type="radio"/>
GatorLight tip sheet about drinking in moderation?	<input type="radio"/>	<input type="radio"/>
The Gator Fan's Code of Conduct?	<input type="radio"/>	<input type="radio"/>
GatorHealth Guide?	<input type="radio"/>	<input type="radio"/>
The public service announcement "Gators Set the Standard – Respect the Swamp?"	<input type="radio"/>	<input type="radio"/>

9. The public service announcement "Gators Set the Standard – Respect the Swamp" concerns which of the following:

- Reducing litter
- Improving traffic flow
- Courteous fan behavior
- Reducing fights
- Preventing excessive drinking
- Not Sure

Game Day Behaviors

“Game Day” is defined as a typical home football game, including activities before, during, and after the game (i.e., tailgating either on or off campus).

10. Do you typically drink alcohol on Game Day?

- Yes
- No

11. Where do you spend the majority of your time drinking alcoholic beverages on game day?

	Don't Drink	Home	Friend's Home	Restaurant	Bar	Tailgate Area	Other
Before the Game?	o	o	o	o	o	o	o
During the Game?	o	o	o	o	o	o	o
After the Game?	o	o	o	o	o	o	o

Game Day Drinking

One drink is defined as 12 oz of beer, 12 oz of wine cooler, 5 oz of wine, 1.25 oz of liquor either straight or in a mixed drink.

Note: please answer the following questions regardless of your location on Game Day.

12. What is the total number of alcoholic drinks that you typically consume before, during, and after a Gator home football game?

13. How many alcoholic drinks do you typically consume during the two hours **before** a Gator home football game?

14. How many alcoholic drinks do you typically consume **during** a Gator home football game?

15. How many alcoholic drinks do you typically consume during the two hours **after** a Gator home football game?

16. What is the total number of alcoholic drinks that you consumed before, during, and after the Gator home football game against Western Carolina?

17. What is the total number of hours that you typically spend drinking on Game Day?

18. **Not including Game Day**, how many alcoholic drinks did you have the last time you “partied”/socialized?

Game Day Health

You are now halfway through the Game Day Survey.

Please finish taking the survey to obtain information regarding the incentives.

At the end of the survey you will be able to view the aggregate group responses to each of the questions.

19. During the 2006 football season, how often did you experience the following due to drinking alcohol on Game Day?

	Never	Rarely	Sometimes	Often	Always
Had a hangover	0	0	0	0	0
Vomited	0	0	0	0	0
Drove after drinking alcohol	0	0	0	0	0
Drove after having 5 or more drinks	0	0	0	0	0
Had a memory loss (blackout)	0	0	0	0	0
Was hurt or injured	0	0	0	0	0
Got into a fight or an argument	0	0	0	0	0
Got reprimanded by the police	0	0	0	0	0
Arrested/ticketed by the police	0	0	0	0	0
Took advantage of someone sexually	0	0	0	0	0
Had been taken advantage of sexually	0	0	0	0	0

Perceptions

20. What percentage of people in the following categories do you believe typically get drunk on Game Day?

Your Friends	<input type="text"/>
Current UF Students	<input type="text"/>
Gator Fans (who are not current students)	<input type="text"/>

Drunk is defined as having one's mental and physical abilities impaired by alcohol. In the state of Florida a blood alcohol level that is equal to or exceeds .08 is considered legally intoxicated or drunk.

21. Please check the circle that shows how likely or unlikely it is that you would do the following.

	Extremely Likely						Extremely Unlikely
I would have more fun if I got drunk on game day:	<input type="radio"/>		<input type="radio"/>				
I would be more social if I got drunk on game day:	<input type="radio"/>		<input type="radio"/>				
My chances of hooking up with someone (having sex) would increase if I got drunk on game day:	<input type="radio"/>		<input type="radio"/>				
I would have a hangover if I got drunk on game day:	<input type="radio"/>		<input type="radio"/>				
I would enjoy watching the game less if I got drunk on game day:	<input type="radio"/>		<input type="radio"/>				
I would embarrass myself if I got drunk on game day:	<input type="radio"/>		<input type="radio"/>				

22. Please check the circle that indicates your level of agreement or disagreement with each of the following statements.

	Strongly Agree						Strongly Disagree
Having fun on game day is important to me:	<input type="radio"/>		<input type="radio"/>				
Being social on game day is important to me:	<input type="radio"/>		<input type="radio"/>				
Meeting someone and hooking up (having sex) with them on game day is important to me:	<input type="radio"/>		<input type="radio"/>				
Having a hangover on game day is a concern of mine:	<input type="radio"/>		<input type="radio"/>				
Watching the game is important to me:	<input type="radio"/>		<input type="radio"/>				
Embarrassing myself due to my drinking on game day is a concern of mine:	<input type="radio"/>		<input type="radio"/>				

Please select the response that most accurately reflects your beliefs for each of the following statements.

23. For me to get drunk on game day is:

Good								Bad
<input type="radio"/>								

24. For me to get drunk on game day is:

Beneficial								Harmful
<input type="radio"/>								

25. For me to get drunk on game day is:

Enjoyable								Unenjoyable
<input type="radio"/>								

26. For me to get drunk on game day is:

Healthy								Unhealthy
<input type="radio"/>								

27. For me to get drunk on game day is:

Favorable								Unfavorable
<input type="radio"/>								

28. For me to get drunk on game day is:

Wise								Foolish
<input type="radio"/>								

29. Please check the circle that indicates your level of agreement or disagreement with each of the following statements.

	Strongly Agree						Strongly Disagree		N/A
My best friend would approve of me getting drunk on game day:	<input type="radio"/>								
My close friends would approve of me getting drunk on game day:	<input type="radio"/>								
My mother (legal guardian) would approve of me getting drunk on game day:	<input type="radio"/>								
My father (legal guardian) would approve of me getting drunk on game day:	<input type="radio"/>								
My current partner would approve of me getting drunk on game day:	<input type="radio"/>								
My ideal future partner would approve of me getting drunk on game day:	<input type="radio"/>								

30. When it comes to drinking alcohol, how motivated are you to meet the expectations of your:

	Very Motivated						Not motivated at all		N/A
Best friend?	<input type="radio"/>								
Close friends?	<input type="radio"/>								
Mother (legal guardian)?	<input type="radio"/>								
Father (legal guardian)?	<input type="radio"/>								
Current partner?	<input type="radio"/>								
Ideal future partner?	<input type="radio"/>								

31. Please check the circle that indicates your level of agreement or disagreement with each of the following statements.

	Strongly Agree							Strongly Disagree
The people in my life whom I value get drunk on game day:	<input type="radio"/>							
The people in my life whom I value would approve of me getting drunk on game day:	<input type="radio"/>							
Most people I hang out with get drunk on game day:	<input type="radio"/>							
The people in my life whom I value encourage me to get drunk on game day:	<input type="radio"/>							

32. Please indicate how often you:

	Always							Never
Use a designated driver or safe transportation on game day.	<input type="radio"/>							
Attend pre-game tailgating activities on game day.	<input type="radio"/>							
Are given free alcoholic drinks on game day.	<input type="radio"/>							
Notice the police on game day.	<input type="radio"/>							
Consider the financial costs associated with consuming alcoholic beverages on game day.	<input type="radio"/>							
Feel hungover from drinking alcohol on the day after game day.	<input type="radio"/>							

33. Please check the circle that indicates how likely or unlikely you would be influenced by each of the following scenarios.

	Extremely Likely						Extremely Unlikely
Having a designated driver or safe transportation influences my decision to get drunk on game day.	0	0	0	0	0	0	0
Attending pre-game tailgating opportunities influences my decision to get drunk on game day.	0	0	0	0	0	0	0
People offering me free alcoholic drinks influence my decision to get drunk on game day.	0	0	0	0	0	0	0
The presence of police deters me from getting drunk on game day.	0	0	0	0	0	0	0
The financial costs associated with alcoholic beverages deter me from getting drunk on game day.	0	0	0	0	0	0	0
Having a hangover the day after a game, deters me from getting drunk on game day.	0	0	0	0	0	0	0

34. Please check the circle that indicates your level of agreement or disagreement with each of the following statements.

	Strongly Agree						Strongly Disagree
I am confident that I can limit my alcohol consumption on game day:	0	0	0	0	0	0	0
I can resist pressure from friends to consume alcohol on game day:	0	0	0	0	0	0	0
It's difficult for me to drink moderately on game day:	0	0	0	0	0	0	0
As I get drunk, I start to lose control over the number of drinks I consume:	0	0	0	0	0	0	0
It's difficult for me to refuse free alcoholic drinks on game day:	0	0	0	0	0	0	0

35. Please check the circle that indicates your level of agreement or disagreement with each of the following statements.

	Strongly Agree						Strongly Disagree	N/A
I intend to get drunk at the next Gator home football game I attend:	<input type="radio"/>							
I intend to drink in moderation at the next Gator home football game I attend:	<input type="radio"/>							
I intend to not drink any alcoholic beverages at the next Gator home football game I attend:	<input type="radio"/>							
I intend to get drunk at every Gator home football game I attend:	<input type="radio"/>							

36. Approximately how many alcoholic drinks does it take for you to become drunk?

37. Is there anything else that you think affects your level of alcohol consumption on game day (Gator home football game)?

Thank You!

You have now completed this survey. To be eligible for the \$50 gift card please e-mail GatorWell at gatorwell@ufl.edu and provide your name, e-mail, and phone number. In the subject line please write Game Day Survey Incentive. Your contact information will not be linked to your survey responses. The first three, middle three, and last three participants to complete the survey will be awarded the incentive. Survey results are available on the subsequent webpage. We appreciate your time and opinions.

APPENDIX B
GAME DAY SURVEY IRB

1. TITLE OF PROTOCOL: Game Day Survey

2. PRINCIPAL INVESTIGATOR(s): *(Name, degree, title, dept., address, phone #, e-mail & fax)* Virginia Dodd, PhD, MPH, Assistant Professor, College of Health & Human Performance, Department of Health Education & Behavior, PO Box 118210, Gainesville, FL 32611-8210, 352-392-0583 ext.1359, vdodd@hhp.ufl.edu.

Tavis Glassman, MEd, MPH, CHES, Coordinator Alcohol of and Other Drug Prevention, Student Health Care Center, PO Box 117500, 392-1161, ext. 4281, tavis@ufl.edu, 846-2628.

3. SUPERVISOR (IF PI IS STUDENT): (Name, campus address, phone #, e-mail & fax)

4. DATES OF PROPOSED PROTOCOL: From: November 1, 2006 To: November 1, 2007

5. SOURCE OF FUNDING FOR THE PROTOCOL:

(A copy of your grant proposal must be included with this protocol if DHHS funding is involved.)

The Student Health Care Center is collaborating with the Department of Health Education and Behavior, College of Health and Human Performance, to implement a grant awarded by the U.S. Department of Education's Grant Competition to Prevent High-Risk Drinking Among College Students. The grant entitled, "Using Social Marketing Principles to Change Social Norms," award number Q184H060086, will be used to collect data regarding the consumption of alcohol and behavior of students on home football games. This data will be used to help develop specific game day messages to be promoted throughout campus.

6. SCIENTIFIC PURPOSE OF THE INVESTIGATION: Determine the proportion of students who engage in high-risk drinking on home football games, as well as assess their level of support for game day prevention messages.

7. DESCRIBE THE RESEARCH METHODOLOGY IN NONTECHNICAL LANGUAGE.

The UFIRB needs to know what will be done with or to the research participant(s).

The online survey is **voluntary** and **anonymous**. No person under the age of 18 will be selected to participate. Over the course of the month, students will receive two additional reminders to log on and complete the survey. There is no compensation for taking this survey.

Note: This survey has been previously implemented by Gator Well Health Promotion Services (UF Student Health Care Center).

8. POTENTIAL BENEFITS AND ANTICIPATED RISK. *(If risk of physical, psychological or economic harm may be involved, describe the steps taken to protect the participant.)*

There are no anticipated risks. Potential benefits include:

- Capture UF student data to determine the Game Day drinking behavior of students.
- Assess what other groups besides students engage in risky behavior on Game Day.
- Determine if football fans noticed any of the health promoting messages the University of Florida produced concerning game day behavior.
- Provide baseline data to help create prevention messages.

Students will receive a cover letter, via e-mail, and will be instructed to click on the Game Day Survey link. Thus, e-mail addresses will not be linked to the survey.

9. DESCRIBE HOW PARTICIPANT(S) WILL BE RECRUITED, THE NUMBER AND AGE OF THE PARTICIPANTS, AND PROPOSED COMPENSATION (if any):

Two thousand students will be randomly selected (by the Registrar) to complete an online game day survey. All participants will be notified via e-mail, to visit the online survey. Students will be required to read an informed consent message prior to taking the survey, which includes instructions.

10. DESCRIBE THE INFORMED CONSENT PROCESS. INCLUDE A COPY OF THE INFORMED CONSENT DOCUMENT (if applicable).

Students will be required to read an informed consent message prior to taking the survey, which includes instructions. See attached survey for details.

Please use attachments sparingly.

Principal Investigator's Signature

Supervisor's Signature

I approve this protocol for submission to the UFIRB:

Dept. Chair/Center Director Date

APPENDIX C
GAME DAY SURVEY E-MAIL INSTRUCTIONS

Dear Gator Fan,

You are among 2,000 Gator fans that have been randomly selected to participate in an anonymous online Game Day survey. Your participation and honest answers are crucial for assessing Game Day public relations efforts, alcohol related issues, and campus safety. **Please participate in this survey even if you do not attend home football games.**

The first three, middle three, and last three survey participants, who complete the survey (and incentive protocol), will receive a **\$50 gift card** to the University of Florida Bookstore.

Instructions:

- **Do not take this survey if you are under the age of 18.**
- This short survey will take approximately **ten minutes** to complete. Please log onto [2006 UF Game Day Survey](#) to begin the survey.
- This survey is completely **anonymous**. You may choose not to participate or not respond to any questions you do not wish to answer.
- Your participation is voluntary. You do not have to answer any question you do not wish to answer.
- You will not be compensated for participating in this survey.
- Potential benefits for study participation include:
 - ✓ Aiding in collecting data to determine Game Day drinking behavior
 - ✓ Aiding in the development of health promoting messages concerning Game Day drinking behaviors produced by the UF
 - ✓ Provide data to help create future Game Day prevention messages.
- There are no anticipated risks related to study participation.
- If you have any questions about your rights as a research participant, contact UF's Institutional Review Board, at 352-392-0433 or irb2@ufl.edu.
- If you have concerns about this survey please contact Tavis Glassman at the Student Health Care Center at 352-392-1161 or tavis@ufl.edu.

Thank you for taking the time and thought to complete this survey. Go Gators!

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BIOGRAPHICAL SKETCH

Tavis Glassman was born on July 17, 1971 in Greeley, Colorado. He grew up in Ohio and attended high school in the Toledo Public School system at Roy C Start. He began his undergraduate studies at the University of Toledo, where he obtained a bachelor's degree in education in health and physical education. During that time period, he coordinated and conducted a variety of health and safety courses while working at American Red Cross Greater Toledo Chapter. In 1995, Tavis' last year at the Red Cross, he earned the *Tiffany Award*, which is awarded to the employee of the year. He later graduated *magna cum laude* and was awarded the Outstanding Undergraduate Student of the Year by the Health Education Department.

Tavis immediately started his graduate work at the University of Toledo pursuing a master's degree in science and education specializing in public health. During that time period he taught sex education in the Toledo Public School system. He also taught a variety of health and safety courses at the university including lifeguarding, personal conditioning, and swimming.

Upon graduation, Tavis moved to Columbus where he earned a Master of Public Health specializing in health behavior/health promotion in the School of Public Health at The Ohio State University (OSU). While attending graduate school, he worked at the Student Wellness Center as the Sexual Health Coordinator. He successfully obtained a grant from the Columbus Health Department designed to reduce high-risk sexual behavior among fraternity and sorority members at OSU. Prior to graduation, he earned his status as a Certified Health Education Specialist.

Shortly after graduating, in 2000, Tavis moved to Gainesville, Florida to accept employment as the Coordinator of Alcohol & Other Drug Prevention at the University of Florida. During his tenure, he was awarded the *Who's Who in Prevention in Prevention Leadership* by the state of Florida and the *Community Recognition Award*, for outstanding prevention service awarded by a local community coalition. In addition, he co-authored a grant from the U.S. Department of Education Grant which was ranked number one out of a 100 applicants.

In the summer of 2003, Tavis was accepted into the doctoral program in the College of Health and Human Performance to pursue a Ph.D in health education and behavior. Throughout his graduate work, Tavis was involved in a variety academic and service initiatives. In the 2004–2005 school year, he worked as a doctoral fellow at the University of Florida Addictive & Health Behaviors Research Institute in Jacksonville Florida. He was involved in several research projects which culminated in presentations at national meetings and manuscripts. In 2006, he received the Outstanding Graduate Student Award by the Department of Health Education and Behavior.

Currently, Tavis maintains his position as Coordinator of Alcohol & Other Drug Prevention at the University of Florida, where he continues to conduct research on game day drinking and other related areas.