INTENTIONS TO DRINK TO INTOXICATION AMONG COLLEGE STUDENTS
MANDATED TO ALCOHOL INTERVENTION: AN APPLICATION AND
EXTENSION OF THE THEORY OF PLANNED BEHAVIOR

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INTENTIONS TO DRINK TO INTOXICATION AMONG COLLEGE STUDENTS
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EXTENSION OF THE THEORY OF PLANNED BEHAVIOR

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Dissertation

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ABSTRACT

College students who have been mandated to alcohol-related interventions are an understudied population. As a result, little is known about the variables which are important in explaining these students’ intentions for high-risk alcohol consumption. Deepening understanding of the underlying motivational factors associated with alcohol-related intentions in this population could lead to more effective interventions and prevention strategies aimed at decreasing alcohol harms. For this purpose, the current study is the first to examine the theory of planned behavior (TPB; Ajzen, 1991) as a statistically predictive model for alcohol-related intentions among college students mandated for intervention.

A sample of 77 mandated college students completed questionnaires measuring the TPB variables of attitude, subjective norm, perceived behavioral control, and intention to drink to intoxication. Regression analyses were used to test the explanatory power of the TPB for intention to drink to intoxication, after controlling for social desirability. Further, the impact of impulsivity and aversiveness of alcohol-related consequence (Barnett et al., 2006) were tested alongside the TPB variables as an extension of the theory.

Results showed partial support for the TPB in explaining alcohol-related intentions in this sample of college students who were mandated for alcohol intervention.
In particular, attitude and subjective norm explained unique variance in intention to drink to intoxication in this sample even after controlling for the variance accounted for by social desirability. Exploratory analyses revealed that attitude, subjective norm, and perceived behavioral control explained unique variance in intention to drink to intoxication for participants who were the heaviest and most frequent drinkers in this sample, which suggested that the TPB was fully supported for this subsample of students. Neither impulsivity nor aversiveness of alcohol-related consequence improved the TPB’s explanatory power. Practice implications for alcohol prevention and intervention development are discussed as well as directions for future research.
DEDICATION

In memory of my mentor and friend who believed in me and reminded me that the world needed me to finish my dissertation.

Steven J. Morris, Ph.D.

October 21, 1948 – October 19, 2008

“Take care, kiddo.”
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An extensive body of literature documents the high prevalence rates of college alcohol abuse (Shim & Maggs, 2005; Slutske, 2005; Wechsler & Nelson, 2008). Despite vast research promoting various intervention and prevention strategies over the last three decades, the number of college students engaging in alcohol abuse has not abated. Sixty-five to 70% of college students report alcohol consumption on a monthly basis (O’Malley & Johnston, 2002), and 44.7% of students report consuming five or more alcoholic beverages at least once over the last month, which the literature defines as heavy or “binge” drinking (Hingson, Zha, & Weitzman, 2009). Further, 17-19% of college students report drinking five or more drinks frequently (i.e., two to three times or more weekly) (O’Malley & Johnston). These statistics are alarming in part due to the range of consequences associated with college alcohol abuse.

The consequences of alcohol abuse on college campuses are widespread and affect college students, campus community members, and the academic institutions. For college students who engage in alcohol abuse, consequences include poor academic functioning, drunk driving, unplanned and unprotected sex, sexual assault, alcohol related injury, alcohol poisoning, alcohol dependence, and legal repercussions (Abbey, 2002;
Hingson et al., 2009; Knight et al., 2002; Neal & Fromme, 2007). Alcohol consumption is the most frequently cited cause for medical emergencies and university disciplinary actions (Kiracofe & Wells, 2007; Wright & Slovis, 1996). Additionally, evidence suggests that even non-drinking students’ academic performance can be impacted negatively by their drinking peers through disrupted sleep and disturbed study time (Wechsler, Moeykens, Davenport, Castillo, & Hansen, 1995). Campus community members also suffer negative consequences such as vandalism, damaged property, and other assaults due to student drinking (Perkins, 2002; Wechsler & Nelson, 2008). For universities and colleges, high rates of alcohol abuse have been linked to declining retention rates that lead to institutional financial losses (Martinez, Sher, & Wood, 2008). Finally, recent research estimates that in the college population of 18-24 year olds, 1800 deaths each year are connected to alcohol use (Hingson et al., 2009).

As a result of these concerns, most colleges have developed some course of action aimed at decreasing alcohol abuse and centered around alcohol treatment, prevention, and intervention strategies. The most frequent approaches to the problem include offering counseling services to students who have demonstrated alcohol problems, providing substance-free residences, employing a specialist in substance abuse, limiting alcohol use at home athletic events, and implementing alcohol education aimed at students perceived to be high-risk (Wechsler, Seibring, Liu, & Ahl, 2004). However, in order to develop efficacious interventions for this population, it is important first to understand the motivational factors which lead to high-risk drinking. Utilizing theory-driven research can provide a framework to study these underlying variables and their impact on alcohol
use. Therefore, the present study sought to examine the application of a theoretical model to explain the alcohol-related intentions of a sample of high-risk college students.

In this introductory chapter, college students who have been mandated to alcohol intervention due to legal or university policy violations are presented as a high-risk population. Then, the theory of planned behavior (TPB; Ajzen, 1991) is asserted as a promising framework which may shed light on the psychological determinants of alcohol-related intentions in students who have been mandated to alcohol intervention. Finally, an extension of the TPB is proposed to explore whether impulsivity and aversiveness of an alcohol-related consequence could improve the TPB’s prediction of alcohol-related intentions in this college population.

**High-Risk Populations**

Although researchers have suggested that alcohol abuse is a risk for all college students, some subpopulations are found to be at higher risk for alcohol-related consequences than are others (e.g., student athletes, fraternity and sorority members) (Turrisi, Mallett, Mastroleo, & Larimer, 2006). One such group at high-risk for alcohol problems is mandated college students. Mandated college students are defined as students who are required to participate in intervention or treatment due to alcohol-related university policy violations or legal infractions. Martens, Neighbors, and Lee (2008) suggested that students who are mandated for alcohol treatment are at particularly high-risk for subsequent alcohol-related problems and thus should be a focus of selective prevention efforts. According to Martens and colleagues, “Selective prevention targets individuals presumed to be at risk for substance abuse based on the presence of
characteristics associated with risk or based on their membership in groups identified as being at higher risk of abuse” (p. 553).

Indeed, some research findings indicate that mandated students are disproportionately heavy drinkers and they are more likely to face alcohol-related consequences than are non-mandated college drinkers (Barnett et al., 2004; Caldwell, 2002; Fromme & Corbin, 2004). Hingson and colleagues (2002) estimated that over 100,000 students between the ages of 18 to 24 are arrested yearly due to alcohol-related violations associated with high risk behaviors including driving under the influence of alcohol and public intoxication. Further, despite the aforementioned efforts to curb these problems, research suggests that alcohol-related arrests continue to grow on campus, leading to additional mandated students (Hoover, 2005).

Although numerous studies have been conducted to understand the prevalence, consequences, and treatment approaches to alcohol abuse on campuses, very little is known about what are effective interventions for the mandated population (Barnett & Read, 2005). One possible reason for this gap in the literature is that mandated students represent a challenging population to serve because they are required to participate in treatment by the university or court rather than participating voluntarily (Martens et al., 2008). Therefore, prevention approaches and interventions for this population may need to consider the possibility of low motivation for behavior change among some of the participants. Further, in contrast to studies that report universal heavy drinking in mandated populations (e.g., Barnett & Read, 2005; Fromme & Corbin, 2004), other research has suggested that this group of students actually demonstrates heterogeneous drinking styles ranging from low-risk behaviors (e.g., minimal alcohol consumption
occurring underage which led to infraction) to high-risk incidents (e.g., alcohol overdose requiring hospitalization which led to infraction) (Barnett et al., 2008; Tevyaw, Borsari, Colby, & Monti, 2007; White, Mun, Pugh, & Morgan, 2007). This variability makes developing interventions aimed at this population challenging due to the wide range of alcohol problems these students may experience.

There are also obstacles to conducting research with this population. For example, relatively little research has been conducted with mandated students because they are difficult to access, possibly due to being considered a “vulnerable population” by Institutional Review Boards. Many barriers have been established to maintain research ethics regarding voluntary participation and confidentiality for students who are required to participate in treatment (Martens et al., 2008). Institutional Review Boards take significant steps to ensure that these students do not feel coerced into study participation due to the fact that they are mandated to attend the intervention.

The extant work with this mandated population is also susceptible to the same problems evident in the collective research on college alcohol abuse. A significant problem that has been highlighted in the literature related to the prevention and treatment of college alcohol abuse is the relative lack of theory used in understanding college alcohol abuse and in the development of effective prevention programs (Broughton & Molasso, 2006). According to Romano and Netland (2008),

Prevention science advocates emphasize that well-developed prevention interventions are theory driven and that prevention theory and practice must continue to merge for prevention science to advance. Too often, prevention projects develop without strong conceptual and theoretical support, and as a result, prevention is sometimes considered to be atheoretical. (p. 780)
The lack of theory-driven research is particularly problematic in college alcohol abuse research because without a theory to guide prevention efforts, it is difficult to understand the mechanisms by which behavior change occurs or why it may not occur. An example of this difficulty in interpreting atheoretical research is a recent study which suggested that after being referred to a mandatory alcohol intervention, a significant number of college students moderated their drinking behavior prior to taking part in the intervention (Morgan, White, & Mun, 2008). Though this finding is certainly interesting, the study itself does not offer insight regarding what factors led to the behavior change and thus the data do not inform researchers how to replicate this outcome.

To address the problem of the literature lacking theory with which to evaluate prevention programs, Romano and Netland (2008) recently called upon counseling psychologists to utilize the theory of planned behavior (TPB; Ajzen, 1991, 1998) in prevention research and practice. As noted by Romano and Netland, the TPB “offers a framework for systemic change among groups with low motivation for change, and provides a process to individualize prevention activities for specific population groups” (p. 800). The current study proposes to use the TPB as an appropriate theory to understand intentions related to drinking behavior in a sample of mandated students.

**Theory of Planned Behavior**

Previous research on the predictive validity of the TPB has resulted in a growing body of literature aimed at developing the TPB interventions which target intentions, and thus aim to change behavior (Godin & Kok, 1996). The TPB posits that behavioral intention is the best predictor of actual behavior (Ajzen, 1991). According to the theory, intentions are determined by attitudes, subjective norms, and perceived behavioral control
Operationally defined, attitudes are the general evaluation of a behavior (which can be positive or negative) and subjective norms signify the perceived social pressure from significant others (e.g., friends, parents, partners, etc.) to engage in the behavior. Attitudes are based upon behavioral beliefs about the expected consequences associated with a specified behavior. Subjective norms are based upon normative beliefs regarding perceived expectations of significant others and the motivation to comply with these expectations. Perceived behavioral control is defined as the extent to which people believe they are able to perform, and can control, the behavior in question. Perceived behavioral control is based upon control beliefs regarding expectations that certain factors will assist or interfere with performing a behavior. To the extent that perceived control reflects actual control, perceived behavioral control affects the relationship between intention and behavior (Ajzen).

Figure 1

Theory of Planned Behavior (Copyright © 2006 Icek Ajzen)
These TPB variables are particularly relevant to the current study of college alcohol use. In college alcohol drinkers, longitudinal research suggests that positive attitudes toward alcohol use are related positively to future alcohol use (Stacy, Bentler, & Flay, 1994). Additionally, accounting for subjective norms is important in college alcohol research as students report that peers are more influential regarding their alcohol use than are adults (Perkins, 2002). Finally, greater perceived behavioral control and drinking refusal self-efficacy (a conceptually related concept) have demonstrated the ability to predict lower drinking rates and fewer alcohol-related harms in college samples (Johnston & White, 2003).

Consistent with the TPB, research has supported that alcohol-related behavior may be predicted from intentions in college drinkers (Armitage, Norman, & Conner, 2002; Collins & Carey, 2007; Johnston & White, 2003; Norman & Connor, 2006). For example, in examining binge-drinking in college students, Johnston and White (2003) demonstrated that the TPB explained 69% of the variance in intentions and subsequently intentions accounted for 51% of the variance in binge-drinking behavior. Similarly, Norman and Connor (2006) found that the TPB explained 66% of the variance in intentions. Currently, however, there is no known research which attempts to predict intentions related to alcohol behavior in mandated college students. Therefore, testing the applicability of the TPB in a mandated sample would be a step in further assessing the utility of the TPB.

Although the TPB has shown success in previous research related to alcohol use in the college population (e.g., Armitage, et al., 2002; Collins & Carey, 2007; Johnston & White, 2003; Norman & Connor, 2006), the prediction of intentions and behavior could
still be improved. One possibility is to assess the influence of additional variables that may explain the variance unaccounted for by the TPB. For example, some researchers suggest there are significant relationships between personality traits and alcohol use (e.g., Brennan, Walfish, & Aubuchon, 1986). Therefore, augmenting the TPB with a specific personality variable, impulsivity, was considered in the current study. Also, because mandated students have recently experienced tangible consequences (e.g., arrest, court dates, court fees/fines, mandatory referral), beliefs regarding alcohol expectancies may be made particularly salient for these individuals; this may have an impact on the underlying social-cognitive influences within the TPB which lead to alcohol-related intentions. Therefore, the variable, aversiveness of consequence, was evaluated as another possible predictor in the TPB model.

**Extending the TPB**

**Impulsivity.** Personality variables have been widely studied as risk factors associated with alcohol abuse. For example, a consistent finding is that impulsive personality traits, including sensation-seeking tendencies, seem to lead to significantly increased rates of alcohol consumption and more alcohol-related risk-taking behavior (Acton, 2003; Cookson, 1994; Galen, Henderson, & Whitman, 1997; Magid, MacLean, & Colder, 2007; Robbins & Bryan, 2004).

In early studies of personality and alcohol use, heavy drinkers were characterized as pleasure seeking, impulsive, and non-conforming (Brennan et al., 1986). In a study of 149 non-alcoholic women, Grau and Ortet (1999) found that impulsivity was significantly related to quantity and frequency of alcohol consumption. In addition to alcohol use rates, impulsivity has also been found to share a relationship to alcohol
problems (Simons, Carey, & Gaher, 2004). A study by Simons and colleagues suggested that as the relationship between alcohol problems and affect lability strengthened, levels of impulsivity also increased. It would seem that the role of impulsivity in a model of alcohol-related intentions and behaviors would be significant; yet, an examination of the literature reveals that little research has examined this question. Despite the numerous studies demonstrating a relationship between a variety of alcohol-related measures and impulsivity (Acton, 2003; Cookson, 1994; Galen, Henderson, & Whitman, 1997; Magid, MacLean, & Colder, 2007), this variable has not yet been explored in the application of the TPB to alcohol use until this current study.

**Aversiveness of consequence.** Although there is a great deal of research aimed at identifying the myriad consequences associated with alcohol abuse in college populations, there is little research assessing students’ reactions to these consequences or how aversive the consequence is experienced. Instead, researchers (e.g., Shim & Maggs, 2005) have seemed to assume that students perceive consequences such as arrests, blackouts, or unintended sexual encounters as being universally negative (Mallett, Bachrach, & Turrisi, 2008). In contrast, other research has indicated that some apparently harmful consequences are not deemed to be negative by the students who experience them. According to Mallett and colleagues, “The possibility that consequences are not necessarily perceived as negative may serve to explain findings that despite experiencing alcohol related consequences, college students continue to drink in a high-risk manner” (p.1376). In their study, fewer than 50% of students who experienced such detrimental consequences as hangovers, waking up in a stranger’s bed, or leaving a party alone (i.e., without the safety of friends’ company) identified these events as
negative and almost half of students who admitted to blackouts, or physical and/or social embarrassment judged these consequences to be either neutral or positive. Twenty-five percent of individuals who experienced a hangover judged this to be a positive outcome to a night of drinking. The authors hypothesized that students may perceive some consequences, such as hangovers, as being a typical part of the drinking experience which is off-set by positive outcomes of the same night. The authors pointed to the importance of these findings because many psychoeducational interventions provide information regarding the range of consequences likely to occur for students who engage in alcohol abuse in effort to motivate students to minimize their alcohol consumption. However, if students perceive consequences such as these as positive or neutral, interventions may be ineffective in shaping students’ decision-making processes regarding their drinking behaviors.

Such reactions to alcohol abuse consequences are important to consider in research on interventions aiming to change students’ intentions to engage in high-risk alcohol consumption. Though some research suggests that consequences including hospitalization and health problems are correlated to increased motivation to change drinking behaviors and to reduced alcohol consumption in adults (Dunn et al., 2003), very little research has explored this relationship in college student populations. Nevertheless, one extant study suggested that students mandated to treatment who perceived their alcohol-related incident to be more aversive were more motivated to decrease their alcohol consumption compared to those students who perceived their incident to be less aversive (Barnett, Goldstein, Murphy, Colby, & Monti, 2006). This study did not assess, however, whether motivation to change alcohol consumption led to
behavior change. Despite this latter limitation, these findings support the importance of assessing intrapersonal factors such as perception of consequences. Specifically, students who attributed their negative incident to their drinking behavior and/or poor decision making judged the incident to be more aversive than did students who did not make these personal attributions. These findings could mean that increasing students’ perceptions of personal responsibility for their drinking-related consequences may lead to perceiving the consequence as more aversive, and thus may subsequently lead to motivation to change their drinking behaviors.

**Summary and Statement of Purpose**

Researchers, college counseling center professionals, and university administrators have recognized the problem of college student drinking over the past three decades. Despite increased efforts to identify interventions which will limit high-risk drinking behavior, many college students continue to drink frequently and heavily and the number of alcohol-related infractions on college campuses continues to grow (Hoover, 2005; Wechsler et. al, 2002; Wechsler & Nelson, 2008). In particular, some researchers suggest that many students mandated for alcohol education are disproportionately heavy drinkers, placing them at higher risk for future harmful consequences (Caldwell, 2002; Larimer & Cronce, 2002).

Though varied interventions for college alcohol abuse exist, research findings largely do not support the efficacy of these interventions for mandated students (Barnett & Read, 2005). Perhaps because little research has applied a theoretical framework to examine these interventions, the variables that could improve the efficacy of these programs are still unclear. The current study seeks to apply the TPB, a model used to
explain behavior, to understand a sample of mandated college students’ intentions to drink to intoxication.

Another aim of the current study is to assess an extension of the TPB by adding aversiveness of consequence and impulsivity to the model as predictors of intention to drink to intoxication. Recent research indicates that if behavior change is to occur for students who have been sanctioned for alcohol treatment, it may not be due to the efficacy of an intervention but rather to the perceived aversiveness of alcohol-related consequences (Barnett et al., 2006). Additionally, research has yet to examine whether personality factors such as impulsivity could impact students’ intentions regarding alcohol-related behaviors. Therefore, a study examining the impact of aversiveness of consequence and impulsivity could advance researchers’ and practitioners’ understanding of the motivations for alcohol consumption among this population. This knowledge is important to the development of more effective, theoretically informed, interventions aimed at decreasing alcohol risks for the mandated population.

**Significance of the Study**

This study extends previous work in the college alcohol abuse literature not only by engaging in theory-driven research with an infrequently studied population, but also by assessing the additive impact of aversiveness of consequence and impulsivity in the TPB. In this way, the present study has implications for furthering understanding of interventions which intend to reduce high risk drinking among mandated college students. This knowledge is expected to be of importance to college administrators, college mental health professionals, university police officials, university residence hall staff, parents, and college students. Additionally, this study is expected to provide
support for utilizing the TPB in developing and evaluating alcohol related interventions for mandated college students, and to stimulate further research efforts in the field of college student alcohol abuse.
CHAPTER II
LITERATURE REVIEW

College alcohol abuse has been a topic of interest to researchers and practitioners dating back to 1953 when Strauss and Bacon conducted the first large scale assessment of college students’ drinking behaviors. Since then, several longitudinal studies have been undertaken to track the extent of alcohol abuse on campuses in the United States (Hoban, 2007; Wechsler & Nelson, 2008). These studies have identified stable rates of alcohol abuse on campuses, despite a plethora of efforts to mitigate this problem. Additionally, the previous literature identified certain subpopulations of students who are at greater risk for alcohol-related harms and consequences. The current study focuses upon students mandated to alcohol intervention as one such group.

Some authors have suggested that students who are mandated for alcohol treatment are more likely to drink heavily and to experience alcohol harms due to their established patterns of high-risk alcohol consumption (Caldwell, 2002; Larimer & Cronce, 2002; O’Hare & Sherrer, 1997; Martens, Neighbors, & Lee, 2008). However, there is a paucity of research which aims to better understand this population and their drinking behaviors. Further, research which has been conducted with the mandated
population has largely not been theory-driven, which is a limitation of a great deal of research in the field of college alcohol abuse.

The current study seeks to address this weakness by proposing the use of the theory of planned behavior (TPB; Ajzen, 1991) to explain intentions for alcohol-related behaviors in a sample of college students who have been mandated for alcohol intervention. This study extends the previous TPB literature by assessing its utility with a new population and also by proposing two additional variables that may enhance the predictive power of the model: impulsivity and aversiveness of consequence.

This chapter begins with an overview of the TPB model. Next, research examining the validity of the TPB is reviewed, with specific emphasis on literature utilizing the TPB to explain alcohol-related behaviors in college students. Then, research on the personality variable, impulsivity, as related to drinking behaviors is reviewed in order to highlight this variable as potentially enhancing the predictive power of the theory. Finally, literature concerning the possible influence of perception of consequence in the TPB model is examined. Specifically, students’ perceptions of the alcohol-related consequence, in terms of the extent it was deemed aversive, is suggested as a variable that may further explain behavioral intention in this particular population.

Overview of the Theory of Planned Behavior

Theory of Reasoned Action (Fishbein & Ajzen, 1975): The beginnings of the TPB. The theory of planned behavior (TPB) is generally used to predict and describe behavior in specific contexts (Ajzen, 1991). The theory originated from Fishbein and Ajzen’s (1975) theory of reasoned action (TRA), which attempted to explain the influence of attitudes on behavior. TRA began as a social psychological theory (for
explaining intentional behaviors) which was developed out of expectancy value theory in the late 1960’s. Expectancy value theory explained how attitudes were formed by underlying beliefs about the probable outcomes of engaging in a specific behavior, weighted by the appraisal (positive or negative) of the outcome. The TRA also recognized the influence of social pressure (i.e., perception of whether important others would think the behavior should, or should not, be performed). TRA proposed that one’s perceived social pressure to engage in a behavior weighted by motivation to comply with important others’ opinions would also influence the decision to perform a behavior. The central contribution of the TRA, however, was the addition of the behavioral intention variable. Behavioral intention is one’s readiness to engage in a specific behavior (Fishbein & Ajzen, 2010).

The TRA was an important development in the attitude-behavior literature at the time of its inception because general attitudes were not explaining a significant amount of variance in behaviors based upon previous models. In fact, Wicker (1969) suggested that general attitudes were unlikely to predict behavior based upon his review of the attitude-behavior research. With the TRA, Fishbein and Ajzen (1975) introduced the variable, intention, which led to better explanation of the attitude-behavior relationship. According to the Fishbein and Ajzen, behavioral intention is the immediate antecedent and most important predictor of behavior.

**The link between intention and behavior.** There is a great deal of literature which suggests a consistent association between intention and behavior. Several meta-analyses have supported the link between intention and behavior (Armitage & Connor, 2001; Notani, 1998; Randall & Wolff, 1994; Sheppard, Hartwick, & Warshaw, 1988). In
an early meta-analysis of 87 separate studies, Sheppard and colleagues reported a mean correlation of .53 for intention and behavior and a mean multiple correlation of .28. More recently, Armitage and Connor (2001) conducted a meta-analysis of 48 studies across several behavioral domains. After controlling for the effects of sample size, they reported a mean correlation of .47 for the relationship between intention and behavior, which suggested that 22% of the variance in behavior was accounted for by intention. In an example of a study which is particularly relevant to the current study, Glindemann, Geller, and Ludwig (1996) conducted research which demonstrated a significant relationship between alcohol-related intentions and subsequent alcohol behavior in a college sample. College students’ were asked to estimate their blood alcohol concentration (BAC) level one week before they attended a fraternity party, and then the researchers objectively measured BAC levels with breathalyzers a week later as the students left the fraternity party. The results showed that participants’ estimates of their BAC were significantly positively related to their actual BAC ($r = .54$). Another test of the relationship between intention and behavior was conducted by these researchers regarding students’ estimates of their BAC directly before entering the fraternity party and then upon leaving the party. This correlation was even stronger ($r = .63$), suggesting that alcohol intentions explained 39% of the variance in alcohol consumption behavior.

**Origination of the TPB.** Overall, the TRA appeared to be supported with behaviors over which one has a good amount of control such as exercise, use of public transport, leisure activities, condom use, breast-feeding, breast self-examination, fruit and vegetable consumption, and various others (see Armitage & Connor, 2001). However, soon after this theory was proposed it became evident that the TRA was limited because
it neglected to account for behaviors that are not under one’s complete control.

Behaviors may not be entirely under one’s control due to a lack of information, knowledge, skills, abilities, or environmental influences. In other words, despite a person’s motivation to engage in a behavior, some behaviors may not be performed because of a lack of resources or due to the presence of other barriers to the behavior. For example, although some people may be motivated to recycle they may not carry out the behavior because they do not have access to transportation or they do not know the location to a recycling center. Therefore, the theory of planned behavior (TPB; Ajzen, 1991) broadened the applicability of the TRA by including the variable, perceived behavioral control, to help explain behaviors that are not under complete control.

**Definition of variables and terms.** The theory of planned behavior (TPB) is constructed of four key variables: intention, attitude, subjective norm, and perceived behavioral control. The TPB contends that intention “captures the motivational factors that influence a behavior; they are indications of how hard people are willing to try, of how much of an effort they are planning to exert, in order to perform the behavior” (Ajzen, 1991, p. 181). According to the theory, the intention to engage in a specific behavior is the immediate precursor to performing the target behavior (Ajzen).

The TPB model suggests that intention is predicted by a person’s (a) attitude toward the behavior, (b) subjective norm, and (c) perceived behavioral control (Ajzen, 1991). **Attitude** relates to the positive or negative appraisals of the target behavior. **Subjective norm** is essentially the perceived social pressures to either perform, or not perform, the target behavior. **Perceived behavioral control** is one’s confidence about the ability to perform, or control, a target behavior. A distinction between perceived
behavioral control, compared to the other TPB predictors, is its ability to directly influence behavior in cases where perceived control accurately depicts volitional control. Each of these three primary predictors is weighted according to its significance to the target behavior and the specific population being studied. In other words, the strength of each predictor will depend upon the specific behavior and the specific population that is of interest. As was illustrated in Figure 1 (page 7), attitude, subjective norm, and perceived behavioral control also have precursors related to core beliefs about the target behavior. Beliefs refer to subjective probabilities regarding each of the three key variables.

According to the TPB, underlying but accessible beliefs precede the formation of attitude, subjective norm, and perceived behavioral control; in this way these beliefs can represent indirect measures of the primary predictors (attitude, subjective norm, and perceived behavioral control). More specifically, attitudes are predicted by a set of salient behavioral beliefs. Behavioral beliefs are the expected outcomes of performing the target behavior. Each behavioral belief is connected to a subjective valuation of the importance of the expected outcomes. The end result is an overall positive or negative evaluation of the behavior. As Ajzen (1991) stated, “We learn to favor behaviors we believe have largely desirable consequences and form unfavorable attitudes toward behaviors we associate with mostly undesirable consequences” (p. 191). Subjective norms are predicted by normative beliefs. Normative beliefs represent the perceived expectations of specific significant others (e.g., friends, family, teachers, etc.). The opinions of specific significant others may hold more or less importance for an individual. Therefore, motivation to comply with these expectations is also considered
along with the normative beliefs about receiving approval or disapproval for engaging in a specific behavior. Perceived behavioral control is predicted by control beliefs (Ajzen, 2006). Control beliefs deal with the factors that individuals believe will facilitate or interfere with behavior performance and the perceived power of those factors (Ajzen).

Ajzen strongly (2006) recommended that when using the TPB to explain specific behaviors, researchers engage in formative research as the first phase of study. Formative research involves eliciting the previously described behavioral, normative, and control beliefs which are most salient to the population of interest in any study. This qualitative data is then content analyzed to identify the most salient and frequently occurring beliefs regarding a behavior. This information is then used to construct items from which the indirect measures of attitude, subjective norm, and perceived behavioral control are derived. These indirect measures are representative of the behavioral, normative, and control beliefs for the specific population of interest to the study. The purpose of identifying these underlying beliefs is to identify the factors that influence behavior the most. With this information, interventions can be developed to change the most important beliefs with the ultimate intention of changing the behavior. Further, the theory can also be used subsequently to evaluate interventions, identifying the aspects of the intervention which proved effective and ineffective. In this way, the TPB has practical purposes.

The TPB is widely studied in social psychology and health psychology (e.g., Chatzisarantis, Hagger, Biddle, Smith, & Wang, 2003; Hurtz & Williams, 2009; Mason & White, 2008). Only recently have counseling psychologists expressed interest in the utility of this theory for prevention-focused work. Romano and Netland (2008)
advocated for the use of the TPB due to its ability to identify a wide range of underlying cognitions and motivations related to a specific behavior. As noted by these authors, understanding these mechanisms of behavior “change” allows for more effective interventions to be developed and evaluated. Further, from a multicultural standpoint, prevention efforts may be more capable of reaching diverse populations because the TPB accounts for the norms and attitudes specific to each group. Another unique contribution of the TPB is its consideration of behaviors which may not be entirely under a person’s control due to societal or contextual influences (Romano & Netland). For these reasons, the TPB appears conceptually to be a promising theory for predicting alcohol-related intentions and behaviors.

Validity Evidence for the Theory of Planned Behavior (TPB)

The predictive validity of the TPB for explaining intentions and behaviors has been tested widely including driving behaviors (Elliott, Armitage, & Baughan, 2007), weight loss (Schifter & Ajzen, 1985), voting (Flynn et al., 1997), AIDS prevention (Richard, van der Plight, & de Vries, 1996), safe sex (Bryan, Fisher, & Fisher, 2002), marijuana use (Conner & McMillen, 1999), smoking (Godin, Valois, LePage, & Desharnais, 1992), exercise (Hagger, Chatzisarantis, & Biddle, 2002), employee development (Hurtz & Williams, 2009), and alcohol consumption (Huchting, Lac, & LaBrie, 2008; Johnston & White, 2003). A detailed review of the TPB’s explanatory power for the many behaviors for which it has been applied is beyond the scope of this review. Instead, results from previous meta-analyses are reviewed and then more detailed discussion of the TPB’s application to alcohol consumption follows. The purpose of this review is to demonstrate that the TPB is a well-supported model of
behavior with the potential to illuminate the mechanisms involved in alcohol-related behavioral intentions among college students mandated to alcohol intervention.

Several reviews and meta-analyses provide evidence to support the predictive validity of the TPB in explaining a range of health-related intentions and behaviors such as smoking, speeding, drunk driving, participating in cancer screening, breast self-exam, dietary behaviors, and condom use (see Godin & Kok, 1996). For example, Ajzen (1991) reviewed the findings of 16 studies (examining 19 behaviors) and found that the TPB explained a significant amount of variance (50%) in intentions. The average multiple correlation was .71 across these studies, ranging from .43 (election participation) to .94 (exercising after child-birth). Though attitudes and perceived behavioral control made significant contributions in predicting intentions across the studies, subjective norms failed to show significant correlations for 9 of the 19 behaviors reported. In terms of predicting behavior, the TPB contends that intentions along with perceived behavioral control should predict behaviors which are not under complete volitional control. Ajzen examined this hypothesis by summarizing the results from 17 studies which assessed behavioral outcomes and found the average multiple correlation for intention and perceived behavioral control was .51 (ranging from .23 to .78). These initial results from Ajzen’s review appear promising, however Ajzen did not report sample sizes, did not mention whether correlations were adjusted for differing sample sizes across studies, and also did not report inclusion criteria for the studies he chose to summarize so there may have been a bias toward reporting research which affirmed the TPB.

However, other meta-analyses have also supported the use of the TPB in explaining behavior. Godin and Kok (1996) conducted a meta-analysis of the TPB
applied to a variety of specifically health-related behaviors such as seatbelt use, participation in health screenings, smoking cigarettes, condom use, disordered eating, drunk driving, and alcohol use. In their review of 56 studies, on average 41% of the variance in intentions was explained by the TPB model (attitude, subjective norm, and perceived behavioral control) and 34% of the variance in behavior was explained by the TPB (attitude, subjective norm, perceived behavioral control, and intentions). Similar to Ajzen’s (1991) previous study, attitudes and perceived behavioral control served as the strongest predictors of intention. Of particular note, and as related to the current study, the averaged multiple correlation for the TPB explaining specifically addiction-related behaviors (e.g., quitting smoking, alcohol and drug abstinence) was .41 and the averaged multiple correlation for the TPB explaining addiction-related intentions was .45. Further, addictive behaviors were moderately correlated with perceived behavioral control (averaged $r = .51$), which was also comparable to the correlation between intention and addictive behaviors (averaged $r = .56$). Therefore, the extent to which individuals felt they had control over their behavior was moderately related to whether or not they engaged in or abstained from an addictive behavior. This meta-analysis demonstrated the utility of including perceived behavioral control when examining addictive behaviors because many individuals lack confidence in their ability to change their use of substances possibly due to physical addiction and/or lack of access to health services.

Building upon Godin and Kok (1996), Armitage and Conner (2001) conducted a comprehensive meta-analysis and found an average multiple correlation for the entire TPB model of attitudes, subjective norms, and perceived behavioral control predicting intention was .63, meaning that 39% of the variance in intention was accounted for by the
model. In this meta-analysis, 44 studies assessed prospective self-reported behavior and 19 studies assessed more objective measures of behavior (taken from records or reported from significant others). From analyses of these aforementioned studies, perceived behavioral control was shown to add significantly to the prediction of intention and behavior above and beyond attitudes and subjective norms. Specifically, perceived behavioral control and intentions accounted for 27% of the variance in behavior. This review expanded upon previous meta-analyses through examining hypothesized relationships between beliefs (behavioral, subjective, and control) and the assumed respective measures of attitude, subjective norm, and perceived behavioral control which are rarely reported if measured. Medium to large associations (as defined by Cohen, Cohen, West, & Aiken, 2003) were found for the expected relationships between behavioral beliefs and attitudes \( r = .50 \), normative beliefs and subjective norms \( r = .50 \), and control beliefs and perceived behavioral control \( r = .52 \).

On the whole, these meta-analyses demonstrated a large body of work, which supported the theory of planned behavior for explaining a variety of behaviors. In particular, the addition of the perceived behavioral control variable to the TRA model originally proposed by Fishbein and Ajzen (1975) appears to add to the TPB’s predictive validity for a range of behaviors (Armitage & Conner, 2001; Godin & Kok, 1996). The practical significance of these empirical findings is that the TPB may represent a general framework for understanding and explaining human behavior. As such, it could be used to ultimately help people solve personal and societal problems which are caused by human behavior. However, a common finding in the meta-analyses that may question the predictive validity of the TPB for these behaviors is that subjective norm was not found
to be a consistent predictor of intentions in the model. Yet, Ajzen (1991) explained that the three antecedents of intentions (attitude toward the behavior, subjective norm, and perceived behavioral control) should perform somewhat differently based upon the target behavior and the specific population being studied. Because college students’ alcohol use has been shown to be influenced by their peers (Beck & Treiman, 1996; Perkins, 2002), the subjective norm variable may show a stronger relationship to alcohol-related intentions in the current study than in previous work which examined various other behaviors. Though the previous meta-analyses reviewed generally provide evidence to support the predictive validity of the TPB across behaviors, the next section of this review is more related to the current study because it focuses directly on the TPB as it has been applied to alcohol-related behaviors in college students.

**Validity Evidence for the TPB Applied to Alcohol Behaviors in College Students**

Although there is research supporting specific variables related to both the theories of reasoned action and planned behavior in the alcohol literature (e.g., Conner, Warren, Close, & Sparks, 1999; Schlegel, D’Avernas, Zanna, DeCourville, & Manske, 1992), only within the last ten years have there been studies conducted to assess the predictive power of the TPB for alcohol-related behaviors in the college population. A review of this literature which assesses the predictive validity of the TPB for college students’ alcohol use follows. In these studies, alcohol-related behaviors have been widely defined as heavy-episodic drinking, binge-drinking, quantity of alcoholic drinks, and drinking “too much.”

In the first identified study to use the TPB to understand the determinants of “binge-drinking” in college students, Norman, Bennett, and Lewis (1998) collected data
from 136 undergraduates (77 females; median age = 20) who attended a Welsh university. The authors reported that they followed Fishbein and Ajzen’s (1975) recommendations for development of the TPB measures by conducting pilot interviews with 16 additional undergraduates. Binge-drinking was defined as consuming 3.5 pints of alcohol for female students and 5 pints of alcohol for male students on one occasion. These researchers assessed the three primary predictors of intention (attitudes, subjective norms, perceived behavioral control) as well as their related beliefs (behavioral beliefs, normative beliefs, control beliefs). However, unlike Ajzen’s recommendations for construction of beliefs’ measures, Norman and colleagues differentiated between positive and negative beliefs and they provided no rational for doing so. Specifically, behavioral beliefs were differentiated between beliefs about positive (“positive behavioral beliefs”) and negative (“negative behavioral beliefs”) outcomes. Normative beliefs were separated between those referents who would encourage binge drinking (“positive normative beliefs”) and those who would discourage binge drinking (“negative normative beliefs”). Control beliefs were also differentiated between circumstances which would facilitate (“positive control beliefs”) and interfere (“negative control beliefs”) with binge drinking. Both partial correlations and regressions were computed to analyze the data because statistically significant gender differences were found for a number of the measures. Men reported more positive attitudes toward binge drinking, they felt more social pressure to binge drink, and they also reported fewer obstacles to engage in binge drinking when compared to women. Further, men reported more frequent binge drinking sessions than the women in this sample.
The outcome of this initial study was somewhat mixed in its support of the theory of planned behavior. For example, the results indicated that 9% of the variance in binge-drinking was explained by gender, but an additional 29% was explained by the TPB model. However, through regression analyses for binge drinking behavior, the only significant independent predictors found were perceived behavioral control and “positive control beliefs.” The authors did not provide data regarding the prediction of intentions to binge-drink. Though this initial study demonstrated a relatively high multiple correlation (38% variance explained) for the model, only perceived behavioral control and positive control beliefs reached significance which provided limited support for the prediction of binge-drinking by the TPB constructs. Further, because this study was conducted at a Welsh university, generalizability to other college students should not be assumed particularly because the legal drinking age is 18 in Great Britain and the underlying attitudes and beliefs may differ from students in other cultures, namely the United States.

In another study examining alcohol use in college students, Wall, Hinson, and McKee (1998) used stepwise regression analyses (conducted separately by gender) to determine if attitudes, subjective norms, and perceived behavioral control predicted students’ intentions to “drink too much.” The authors did not provide a more specific definition of the target behavior. Participants were 316 undergraduates (146 females; mean age = 19.91, SD = 2.85) who attended the University of West Ontario and reported drinking at least once monthly. All participants were of legal drinking age, which is 18 in Canada. These authors used stepwise regression instead of hierarchical multiple regression to analyze the predictive utility of the model because they examined alcohol
expectancy factors (sociability, impairment, assertiveness, and sexual functioning) as possible predictors.

Results showed that attitudes, perceived behavioral control and sociability expectancies predicted intention to “drink too much” for women. In contrast, attitudes, subjective norms, and perceived behavioral control predicted intention for men. In terms of drinking behavior, intentions, perceived behavioral control, and assertiveness expectancies were predictive for women. Assertiveness expectancies referred to the participants’ beliefs that drinking too much would result in increasing their ability to be assertive. However, intentions and higher sexual functioning expectancies were predictive of behavior for men. This study was limited by its measures of the TPB, as the authors did not follow Ajzen’s (1991, 2006) recommendations for engaging in formative research as the first phase of study. In fact, the internal consistency for their subjective norm measure was reported to be “unacceptably low” (they did not report the value of the alpha) and thus the authors chose to use a single item that reflected participants’ motivation to comply with the perceived “general societal pressure to engage in excessive consumption” (p. 412). The current study sought to address this measurement issue by engaging in formative research first and then using a pilot study to assess the reliability of the questionnaire.

In a subsequent study, Johnston and White (2003) examined the predictive validity of the TPB to predict “binge-drinking” among 289 first year undergraduate students at an Australian university. The sample consisted primarily of females (80%) and the mean age of the sample was 26 ($SD = 9.66$; range 18-59). The authors did not report the median age which might have provided a better representation of their sample
given the apparent outliers. The authors defined binge-drinking as consuming five or more standard alcohol beverages on one occasion over the past 2 weeks. Survey data were collected twice; in the first wave data were collected for the TPB predictor variables and in the second wave data were collected regarding self-reported alcohol consumption. Notably, Johnston and White substituted a measure of self-efficacy for perceived behavioral control, providing a rationale that the two constructs were conceptually similar and that previous research had also made this substitution.

Using multiple regression, the TPB explained 69% ($p < .001$) of the variance in behavioral intentions. Intention to binge-drink was significantly predicted by the TPB variables including attitude, subjective norm, and self-efficacy. Another multiple regression was conducted with amount of alcohol consumed (target behavior) as the dependent variable and intention and self-efficacy as independent variables; the results indicated that intention and self-efficacy together explained 51% of the variance in alcohol consumption. Intention, however, was the only significant contributor to the prediction of alcohol consumption. The failure of self-efficacy to predict binge-drinking may have reflected a problem with the authors’ choice to operationalize perceived behavioral control with a self-efficacy measure. Another limitation of this study is lack of generalizability of the sample, given that the majority of the participants were women and the mean age of this sample may be older than the general undergraduate population in the United States. Further this study, as well as others did not assess for social desirability. The lack of accounting for social desirability is a problem that is evident in all of the research using the TPB for explaining alcohol behaviors in the college population, which will be addressed in the current study.
Collins and Carey (2007) attempted to improve upon these previous studies by using latent factor structural equation modeling to test the TPB’s predictive validity for explaining intention and “heavy episodic drinking” in a college student sample. The authors purported that they improved previous work by using a longitudinal design and statistical analyses which allowed for a confirmatory test of the theory rather than simply an exploratory test of the theory. In this study, heavy episodic drinking was defined as “number of drinks consumed during the peak drinking occasion in the past 2 weeks and number of heavy-drinking episodes” (p. 502). Heavy drinking episodes were defined as consuming five or more alcoholic beverages on one occasion for men and four or more alcoholic beverages on one occasion for women. Data were gathered via a self-report measure of drinking behaviors. Participants were 131 (83 women) undergraduate students at Syracuse University and the mean age of the sample was 18.95 ($SD = 2.67$), therefore, several of the participants were not of legal drinking age. This study was one of the few which provided the racial/ethnic background of the participants (2% of the participants identified as Hispanic/Latino, 5% identified as Asian, 1% identified as multi-racial, and 92% identified as Caucasian).

Results suggested that attitude and drinking refusal self-efficacy (the construct used to represent perceived behavioral control) significantly predicted intention, explaining 47% of the variance. Therefore, in this sample it seemed that students’ choices to engage in heavy drinking were most influenced by their beliefs about the likely outcomes of their drinking and also the extent to which they felt they were capable of refusing alcohol. Further, the hypothesized model test suggested adequate fit (CFI=.98, RMSEA = .04). However, subjective norm did not significantly predict intention reliably
in the structural models. This finding is consistent with previous meta-analyses across behaviors which suggested that subjective norm performs less well than perceived behavioral control and attitude in the prediction of intention (Ajzen, 1991; Godin & Kok, 1996). Also, Collins and Carey (2007) admitted that they did not have sufficient sample size to ensure adequate power for the advanced statistical procedure they chose to use in this study. For example, for a power of .80 structural equation modeling required a sample of 200 participants but only 131 students participated in this study. Again, social desirability was not measured in this study. Because this study was conducted in the United States, where consuming alcohol below the age of 21 is illegal, measuring social desirability would seem to have been important due to the possibility of participants underreporting their use.

In the most recent application of the TPB to college alcohol-related behavior, Huchting and colleagues (2008) assessed the utility of the TPB in explaining sorority drinking behaviors. In this study, 247 female participants (mean age = 19.43; SD = 1.06) completed questionnaires assessing attitude, subjective norm, perceived behavioral control, drinking intentions, and self-reported drinking behaviors. Drinking behavior was defined by the average number of standard drinks consumed per occasion over the last 30 days and the maximum number of standard drinks consumed at any one time over the last 30 days. Participants were provided the definition of “standard drink” as one 12 oz. beer, 8 oz. malt liquor, 4 oz. glass of wine, or 1.25 oz. of 80-proof liquor. Data were collected at baseline and one month later.

This research demonstrated strong support for the predictive power of the TPB in a sample of sorority women. Results indicated that overall the TPB model accounted for
44.7% of the variance in intention and 73.4% of the variance in alcohol-related behavior. In this sample, only attitude and subjective norm predicted intentions; however, consistent with the theory both intentions and perceived behavioral control had a direct link to predicting behavior. Therefore, at least within this sorority sample, the perception of control over alcohol consumption directly influenced their alcohol use. Additionally, this study showed a significant contribution of subjective norm, which is a construct that has previously shown statistically inconsistent contributions to the TPB model as seen in the review of the previous meta-analyses and in Collins and Carey’s (2007) study. Further, subjective norm actually had a stronger impact on intentions than both attitude and perceived behavioral control in this study.

This research may shed light on important information reflecting the significant impact that “peer pressure” has on sorority members; however, caution should be noted in these results because Huchting and colleagues did not follow Ajzen’s procedure for developing measures based upon an elicitation study in formative research. Instead, the attitude construct was adapted from another measure, the Drinking Motives Questionnaire (Cooper, 1994). Further, rather than assessing which referent others would be important to assess for subjective norms in this sample, participants were asked to reflect upon the perceived norm of the “typical sorority member.” The perceived behavioral control measure was adapted from four items on the Rutgers Alcohol Problem Index (White & Labouvie, 1989), which appeared to reflect the inability to refrain from drinking. Finally, as is consistent with previous studies in the college population, social desirability was not measured in this study and thus could have confounded the results.
In reviewing studies which assessed the predictive validity of the TPB as applied to alcohol-related behaviors in college samples, there seems to be some evidence to suggest this model has merit. However, there are also notable limitations and inconsistencies in this research which make comparisons across studies challenging. First, the definition of the target behavior (i.e., alcohol-related behavior) is notoriously inconsistent, and this interferes somewhat with the ability to aggregate the findings. The research reviewed here used criterion variables that included binge drinking, heavy episodic drinking, drinking “too much,” and frequency/quantity of alcohol use. This criticism is not specific to the TPB literature, but rather is a consistent problem across all college alcohol-abuse literature.

Another limitation in this research is the lack of acknowledgement of the possible effects of socially desirable responding. It is surprising that this possible confound has been neglected in this literature given that most of the data collected are self-reported. Accounting for social desirability would seem particularly important given that college students are typically well aware that drinking underage is illegal and that heavy drinking at any age is socially unaccepted. In an attempt to strengthen the TPB and college alcohol abuse literature, the current study measures social desirability as a possible covariate in explaining alcohol-related intentions.

Also, given the range of variance accounted for with the TPB, there is inconsistency with regard to how outcomes from the TPB studies are interpreted. For explaining alcohol-related intentions in the college population, the theory appears to account for between 40% and 70% of the variance; for alcohol-related behaviors, the TPB appears to explain between 22% and 74% of the variance. As a result, some
researchers (e.g., Armitage & Connor, 2001) suggested that the TPB performs well in accordance with Cohen and colleagues’ (2003) criteria for medium to strong effect sizes, while others (e.g., Rhodes, Courneya, & Jones, 2003) critiqued the TPB for “only” explaining half of the variance. Clearly there are methodological inconsistencies which may account for the range of effect sizes. One possibility for the discrepancy is the extent to which researchers follow Ajzen’s guidelines for assessing the TPB variables. Specifically, the aforementioned research is inconsistent with regard to the extent that researchers utilized formative research in the first stage of their studies. Ajzen (2006) noted, 

Investigators often mistakenly assume that direct measures of the theory’s constructs are obtained by asking a few arbitrarily selected questions, or by adapting items used in previous studies. Although this approach often yields findings of interest, it can produce measures with relatively low reliabilities and lead to an underestimate of the relations among the theory’s constructs and of its predictive validity. To secure reliable, internally consistent measures, it is necessary to select appropriate items in the formative stages of the investigation. Different items may have to be used for different behaviors and for different research populations. (p. 4) The problems Ajzen discussed above were evident in the previously reviewed studies. Only Norman et al. (1998) mentioned following Fishbein and Ajzen’s (1980) guidelines for engaging in formative research through an elicitation study and yet they also altered Ajzen’s recommendations by specifically analyzing the effects of negative vs. positive beliefs. The other studies reviewed typically borrowed and adapted items from other measures (e.g., Drinking Motives Questionnaire) or applied measures previously used in conceptually related research (e.g., drinking-refusal self-efficacy). Ajzen (2006) clearly advised against both of these strategies. The current study aspired to strengthen and contribute to the existing TPB literature by following Ajzen’s
recommendations to begin this project with formative research which entailed an elicitation and pilot study taken from the target population for which it was intended.

In addition to critiques regarding problems with measurement of the predictor variables in the TPB, some authors point to other relative weaknesses of the theory and note that there is a large percentage of variance left unexplained by the model. In response to these criticisms, other researchers have proposed additional constructs which may strengthen or augment the model (Conner & Armitage, 1998) such as past behavior/habit (see Eagly & Chaiken, 1993), self-efficacy (e.g., Terry & O’Leary, 1995), moral norms (e.g., Kurland, 1995), group identification (Terry, Hogg, & White, 1999), and reactance (Orbell & Hagger, 2006) Ajzen (1991) even supported the addition of other variables to the model stating,

The Theory of Planned Behavior is, in principle, open to the inclusion of additional predictors if it can be shown that they capture a significant proportion of the variance in intention or behavior after the theory’s current variables have been taken into account. The Theory of Planned Behavior in fact expanded the original theory of reasoned action by adding the concept of perceived behavioral control. (p.199)

Recently, Sharma (2007) also criticized the theory for not accounting for personality-related factors, culture, and other demographic variables which may be linked to behavior. Churchill and colleagues (2008) further noted, “little consideration has been given to individual differences in personality within the theoretical framework of the TPB, despite there being known associations between personality and various behavioral outcomes” (p. 632). There may be a paucity of research looking at the role personality plays in the TPB because Ajzen proposed that individual differences variables are exogenous, or background, variables which influence behaviors only through the
predictors already operationalized by the TPB (Ajzen, 1991; Churchill, Jessop, & Sparks, 2008). Evidently, the literature reveals conflicting opinions regarding the function and value of explicitly testing personality in the model. In the current study, the TPB was extended to identify if a personality-related variable, impulsivity, could enhance the model’s predictive validity in explaining alcohol-related intentions. A review of literature which highlights the potential utility of augmenting the TPB with impulsivity follows.

**Impulsivity**

In order to examine the divergence between Ajzen’s (1991) original conceptualization of the TPB and Churchill and colleagues’ (2008) aforementioned perspectives, the current study assesses impulsivity as a potential contributor to the predictive validity of the TPB. This section of the literature review begins with summarizing research which has reported a relationship between personality and alcohol-related behaviors, with specific emphasis on impulsivity as exhibiting a particularly consistent link. Hollander and Evers (2001) defined impulsivity as a dimension of personality, which reflects, …the failure to resist an impulse, drive, or temptation that is harmful to oneself or others. It is a measurable feature of behavior, manifesting as impatience (including the inability to wait for rewards), carelessness, risk-taking, sensation-seeking and pleasure-seeking. (p. 950)

This section concludes with a review of the few studies which have attempted to augment the TPB with impulsivity to demonstrate a need for further research examining this variable’s use in improving the prediction of alcohol-related intentions over and above the TPB’s key variables.
Impulsivity and Alcohol Use

The correlation between personality variables and alcohol abuse has been widely studied (e.g., Brennan, Walfish, & AuBuchon, 1986; Feil & Hasking, 2008; Goldstein & Flett, 2009; Martin & Sher, 1994; Paunonen & Ashton, 2001; Ruiz, Pincus, & Dickinson, 2003). Personality has been defined as, “the characteristic ways of thinking, feeling, and acting that show some consistency when measured across situations and over time” (Baer, 2002, p. 42). The most consistent relationship reported across all alcohol-related behaviors and problems has been with aspects of personality regarding impulsivity (Brennan et al., 1986; Sher & Trull, 1994; Windle, 1990). This finding has also been documented in studies specific to alcohol use in college samples (Brennan et al., 1986).

For example, Brennan and colleagues (1986) summarized data from 20 studies collected over thirty years (from 1953-1984) in a review of individual and personality correlates of alcohol use and abuse in college students. They reported:

Of the 20 studies examining alcohol use in relation to impulse expression/sensation seeking, most came to a similar conclusion: that college students who drink in great quantity, drink frequently, and who experience more negative consequences as a result of drinking are more likely to be classified as impulse expressive, sensation seeking, or subscribing to the “hang loose ethic”… This robust finding prevails over large numbers of male and female subjects from diverse areas of the United States and Great Britain, and various measures of alcohol use and abuse. (Brennan, Walfish, & AuBuchon, 1986, p. 457)

These findings appeared consistent across studies of both observed and self-reported behaviors. An implication of Brennan and colleagues’ review is that impulsivity may have a more direct impact on alcohol-related intentions and
behaviors than Ajzen (1991) hypothesized based upon his contention that personality variables are only distal factors in explaining behaviors within the TPB. However, caution is warranted in making assumptions based on Brennan’s conclusions because the authors did not provide specific data in terms of effect sizes to support their contention that these impulsivity-related personality facets showed a “robust” relationship with alcohol behaviors. Further research is needed to identify and quantify the strength of the relationship between impulsivity and alcohol behaviors.

In a more recent review of research examining college samples, Baer (2002) summarized a variety of intrapersonal variables that are related to variation in alcohol consumption, including impulsivity. Studies were only included if they were published and conducted with college samples in the U.S. Participants in the various studies reviewed were reported to be primarily of the ages 18 to 21. Baer did not report the number of studies he reviewed from which he based his conclusions, so the comprehensiveness of his search cannot be determined. From his review, Baer supported Brennan and colleagues’ (1986) findings and stated, “A pattern of impulsivity/sensation seeking is strongly related to increased drinking among students” (p. 40).

There are two problems with Baer’s statement which may reflect other limitations in the literature examining impulsivity. The first problem concerns Baer’s description of a “strong” relationship between impulsivity/sensation seeking and alcohol use. The second problem concerns combining impulsivity
and sensation-seeking into one general concept (i.e., “impulsivity/sensation-seeking”). The implications of these issues will be addressed consecutively.

Consistent with Brennan’s (1986) review, Baer did not report any quantifiable data to demonstrate the overall significance of the positive correlations found between impulsivity and alcohol use. As a result, the strength of the relationship between impulsivity and alcohol-related behavior still appeared unclear and required more sophisticated analyses to demonstrate the magnitude of the relationship. Therefore, to examine this question a more recent meta-analysis exploring sensation-seeking (a marker of impulsivity) and alcohol consumption by Hittner and Swickert (2006) quantitatively described the overall significance of this relationship.

Hittner and Swickert (2006) conducted an extensive search of literature pertaining to research which examined the relationship between sensation-seeking and alcohol use. After excluding articles which did not report statistical data, the researchers analyzed a total of 61 studies and reported a small to moderate mean weighted correlation for alcohol use and sensation-seeking ($r_w = .263; 95\%\ CI = .216 -.309; p < .001$). It is important to note that the authors transformed correlation coefficients to corrected $z$ scores to account for skewed distributions and estimate bias, and then the adjusted $z$ scores were weighted by sample size. Weighted $z$ scores were then transformed back to weighted correlation coefficients and were used to compute effect sizes. Fail-safe $N$ (Rosenthal, 1991) was also computed for the mean weighted correlations to identify whether the effects were robust against unpublished research (studies which resulted in non-significant findings).
Although it was significant, the average effect size was not strong for sensation-seeking (Hittner & Swickert, 2006), which contradicts Brennan et al. (1986) and Baer’s (2002) statements. A possible explanation for the small to moderate relationship found in Hittner and Swickert’s study is that the specific factor of sensation-seeking plays a less significant role in alcohol-related behavior than other impulsivity facets. Another possibility is that the strong associations found between sensation-seeking and alcohol use were exaggerated because some of the sensation-seeking measures used in the studies which were reviewed by Brennan and Baer (e.g., Sensation Seeking Scale, Zuckerman, 1979) actually contained questions which ask about alcohol use. This issue could magnify the relationship between sensation-seeking and alcohol use inappropriately due to contamination of the scale’s criterion validity (Darkes, Greenbaum, & Goldman, 1998; Hittner & Swickert, 2006; Liraud & Verdoux, 2000). Evidently, there are some limitations in the literature which examined the relationship between impulsivity and alcohol-related behavior regarding measurement and the interpretations which suggested strong correlations. The current study attempted to address this problem by utilizing a measure of impulsivity which did not include any items that asked about alcohol use.

The second issue raised by Baer’s (2002) conclusion concerns the lack of a specific operational definition of impulsivity. The conceptual overlap between impulsivity and sensation-seeking is somewhat unclear, yet researchers tend to speak about these variables interchangeably (e.g., Baer, 2002; Brennan et al., 1986). Though related, sensation-seeking and impulsivity may tap slightly different qualities such as the
tendency to seek novel situations versus the tendency to act without forethought. Therefore, it may be inappropriate to assume that sensation-seeking and impulsivity operate equivalently in their relationship to alcohol use. The current study attempted to address this limitation by specifically using a measure of impulsivity that accounts for four different facets of impulsivity: sensation-seeking, urgency, perseverance, and premeditation.

The inconsistency with which impulsivity has been defined in the research has long presented a challenge in making firm generalizations across the literature. For example, Depue and Collins (1999) stated, “Impulsivity comprises a heterogeneous cluster of lower-order traits that includes terms such as impulsivity, sensation seeking, risk taking, novelty seeking, boldness, adventuresomeness, boredom susceptibility, unreliability, and unorderliness” (p. 495). Within the last decade researchers have begun to acknowledge the multidimensionality of impulsivity as a construct (see Whiteside & Lynam, 2001). The current study strengthens the previous literature by utilizing a validated multidimensional measure of impulsivity.

Regardless of the controversy surrounding operational definitions of impulsivity, a great deal of contemporary research continues to study the construct with measures that fit the purpose of their work. For example, in a study comparing college alcohol abusers to non-abusers, MacKillop and colleagues (2007) measured impulsivity with markers of risk-taking behaviors, lack of planning ahead, pleasure-seeking tendencies, lack of future orientation, and thrill-seeking tendencies. In their study of 93 college drinkers (76% male; mean age = 19.35), MacKillop and colleagues compared hazardous drinking
students to a control group of social drinkers. Hazardous drinkers were identified by scoring a 6 or more on the Alcohol Use Disorders Identification Test (AUDIT; Babor, Kranzler, & Bohn, 1991) and social drinkers scored a 5 or less. The AUDIT is used to measure alcohol use and alcohol problems. Typically, a score of 8 or more is used to identify hazardous drinkers; the authors did not explain their rationale for lowering the threshold in their study.

ANOVAs were used to compare impulsivity between the two groups. Findings suggested that hazardous users reported significantly greater impulsivity (MacKillop et al., 2007). However, this study’s findings should be interpreted cautiously because the sample was pulled from a larger study which assessed gambling behaviors, thus all participants reported at least some gambling behaviors which may confound and limit the generalizability of the results. However, if the findings of this study are accurate, it may suggest that individuals who are more impulsive tend to consume greater amounts of alcohol and experience more alcohol related problems as measured by the AUDIT. Of relevance to the current study, this finding suggests that those who are more impulsive may have greater intentions to drink to intoxication.

In summary, the extant literature demonstrates that a variety of research has identified impulsivity as being positively related to alcohol consumption and alcohol problems (Arnett, 1996; Bucholz, 1990; Camatta & Nagoshi, 1995; Jackson & Matthews, 1988; Robbins & Bryan, 2004; Wood, Nagoshi, & Dennis, 1992; Zuckerman & Cloninger, 1996). Due to the evidence provided by these studies which examined the last 50 years of literature demonstrating a link
between impulsivity and alcohol behaviors, the current study focuses upon impulsivity as a personality construct which has the potential to contribute to the prediction of alcohol-related intentions alongside the key variables of the TPB. The literature reviewed next further explores how impulsivity may specifically play a role in the TPB.

**Impulsivity and the Theory of Planned Behavior**

Given the prevalence of research identifying the association between impulsivity and alcohol-related behaviors, this variable seems to merit explicit exploration within a TPB model which seeks to predict alcohol-related intentions among college students in a mandated sample. Though Ajzen (1991) contended that individual differences variables, such as personality factors, are not necessarily additive within the context of the TPB due to their indirect and distal influences on behavior, recent research is discussed next which has contradicted this point of view by demonstrating that impulsivity may enhance the TPB model.

For example, impulsivity has been shown to be a significant predictor for high-calorie snack consumption, even after accounting for the main TPB variables (attitude, subjective norm, perceived behavioral control) (Churchill, Jessop, & Sparks, 2008). Churchill and colleagues also included anticipated regret, and anticipated affective reactions as possible predictors in their extended TPB model. Participants were 315 adults (66% women) ranging in age from 16 to 67 years old ($M = 38.50; SD = 11.78$) in the United Kingdom. Impulsivity was measured with the UPPS impulsive behavior scale (Whiteside & Lynam, 2001) which includes four related subscales: urgency, lack of premeditation, lack of perseverance, and sensation-seeking. Surveys were completed at
time 1 regarding intentions and again 2 weeks later regarding reported behaviors. Because bivariate correlations were not significant for associations between impulsivity and intentions, further analyses were only computed for reported behavior. A hierarchical multiple regression model was used to determine the role of impulsivity in predicting behavior. The addition of impulsivity to the model significantly increased the variance accounted for in the reported behavior (high-calorie snack consumption). Specifically, impulsivity accounted for an additional 4% of the variance, on top of the 23% variance accounted for by the TPB, anticipated regret, and anticipated affect. The final extended TPB model with impulsivity explained 27.1% of the variance in behavior.

Therefore, this research suggested that the strength of the TPB in predicting high-calorie consumption was enhanced by adding a measure of impulsivity to the model (Churchill et al., 2008). Specifically, the authors stated, “for at least some behaviors, measures that tap the extent to which people act on impulse may be important independent predictors of behavior alongside factors that reflect more deliberative information processing” (p. 641). This study was the first, and thus far only, to examine the impact of impulsivity within the TPB model. Because this is the case, it should not be assumed that the influence of impulsivity would be applicable across other tests of the TPB model with various behaviors. Therefore, the current study attempted to advance this research by examining if the variance explained in alcohol-related intentions could also be enhanced by adding impulsivity, as measured by the UPPS Impulsive Behavior Scale (Whiteside & Lynam, 2001), to the TPB model.

Further limitations to Churchill and colleagues (2008) study include lack of generalizability due to: the snowballing technique used by the researchers to recruit
participants, the respondents all lived in the U.K., and the sample consisted of more women than men. Also of note in this study, social desirability may have played a role in the self-reports of the participants, however this was not assessed. Finally, the authors did not further explain the implications of anticipated regret and anticipated affect within the model even though these variables appeared highly correlated with dietary restraint and other TPB variables, specifically intentions (anticipated regret = .68, \( p < .001 \); anticipated affect= .33, \( p < .001 \)). Despite these limitations, Churchill and colleagues have provided support for examining impulsivity within a TPB model.

**Summary of Literature on Impulsivity, Alcohol Use, and the TPB**

Impulsivity is the most consistent personality construct reported in the literature to have a relationship with alcohol-related behaviors (Baer, 2002; Sher & Trull; 1994). However, due to inconsistencies in the operational definition of impulsivity and measurement issues, the magnitude of the relationship is somewhat unclear. Nonetheless, given the prevalence of the reported relationship and the extent to which the relationship has been deemed to be at least moderate, studying the use of impulsivity as a predictor of alcohol-related intentions is warranted.

Further, some research has examined the impact of impulsivity within the TPB model despite Ajzen’s (1991) original contention that personality factors are only distal influences on behavior. In particular, Churchill and colleagues (2008) recently conducted a study which showed that impulsivity had a direct impact on high-calorie snack consumption above and beyond the TPB variables. Therefore, further research is needed to understand whether impulsivity is additive to the
TPB model in the explanation and prediction of other behaviors as well, such as alcohol use.

Currently, no studies have examined the possible role that impulsivity plays within the TPB model in the prediction of alcohol-related intentions and behavior. Due to the precedent set by very recent literature which has successfully used impulsivity to augment the predictive power of the TPB, the current study builds upon previous work by exploring the role of impulsivity within the TPB model to predict mandated college students’ intentions to drink to intoxication. This appears to be an important research question because if impulsivity relates to decisions students make regarding alcohol use, matching alcohol interventions to personality style, or impulsive tendencies, may be justified.

**Perception of Consequence and Alcohol-Related Behaviors**

In addition to the function of impulsivity in the TPB, there is reason to believe that examining the role that perception of consequence, and specifically aversiveness of consequence, plays in augmenting the theory of planned behavior is a worthwhile endeavor. The specific consequence which the participants have experienced in the current study is a legal infraction. As stated previously, the TPB posits that attitudes toward a behavior reflect the salient, or “accessible,” beliefs one holds about the outcome of a particular behavior (Ajzen, 1991). Because the current study seeks to predict alcohol-related intentions in a sample of students who have recently been cited for infractions related to alcohol use, it is hypothesized that actually experiencing this consequence (as opposed to the belief that one could hypothetically experience an
infraction) may make beliefs about these outcomes more salient for some students, resulting in a more direct impact on intentions. Therefore, the current study seeks to examine the role of aversiveness of consequence in influencing students’ intentions to drink to intoxication.

A vast amount of research has uncovered the many consequences which accompany college alcohol use and abuse (see Abbey, 2002; Hingson et al., 2009; Neal & Fromme, 2007). However, researchers have only begun to acknowledge that students display varying reactions and perceptions of these alcohol-related consequences (see Mallett, Bachrach, & Turrisi, 2008) and it is still unclear what impact these perceptions have on drinking behavior. The extant literature suggests that more research is needed to understand the impact that experiencing certain consequences has on students’ cognitions, evaluations, and attitude development regarding their alcohol use (Patrick & Maggs, 2008). The most recent efforts to identify the underlying social-cognitive factors involved in alcohol-related consequence perception have investigated variables including aversiveness of consequence experienced (Barnett, Goldstein, Murphy, Colby & Monti, 2006; Mallet, Bachrach, & Turrisi, 2008; Reis, 2007), alcohol expectancies (McNally & Palfai, 2001), and anticipated regret (Cooke, Sniehotta, & Schuz, 2007; Sandberg & Connor, 2008). The following section outlines studies which highlight a need for further research to better understand the impact of consequence perception in explaining alcohol related intentions and behaviors.

**Aversiveness of consequence.** Assessing students’ perceptions of consequences appears to be important in understanding factors that are related to college alcohol use. Specifically, research has revealed that all alcohol-related consequences are not perceived
similarly among college students (Mallet, Bachrach, & Turrisi, 2008). However, when the consequence is deemed severe (e.g., alcohol overdose), students are more likely to report intentions to change their consumption (Reis, Harned, & Riley, 2004).

Specifically, it seems that significantly aversive consequences, such as hospitalization for alcohol overdose, tend to lead students to make plans to moderate alcohol consumption. In a study of 50 first-year students who had been transported to an emergency room after overdosing, 83% of these individuals reported intentions to decrease how much alcohol they consumed, 60% planned to decrease how quickly they consumed alcohol, and 48% reported intentions to decrease how frequently they drank (Reis et al., 2004). Students in this study also reported the following concerns associated to their alcohol overdose: 83% were concerned about University disciplinary procedures, 83% were concerned about academic problems, and 82% were concerned about the guilt they felt due to the event.

At least in this study, a large percentage of students who experienced an overdose reported intentions to decrease their alcohol consumption and reported feelings of guilt (Reis et al., 2004). Also, 76% of the sample endorsed that the reason for their overdose was, “I made a stupid decision to drink too much” (p. 240). The authors stated, “Overall, students going through the experience have major regrets and seem to be able to accept responsibility for their actions” (p. 242). Though this study did not specifically assess aversiveness, due to the prevalence of feelings of guilt and other concerns it would follow that the event was experienced negatively. However, the sample size of this study was relatively small which didn’t allow for more sophisticated statistical analyses beyond basic descriptive statistics.
In a related study, students’ reactions to alcohol-related incidents seemed to be related to the attributions they made about the incidents, and the perceived aversiveness of the incidents. Barnett and colleagues (2006) found that students who judged their incidents as more aversive were also more motivated to decrease their alcohol consumption. In this study, 227 (52% female; 75.8% Caucasian) students from a private university who were mandated to intervention due to alcohol related infractions completed measures of alcohol use and alcohol problems prior to taking part in an intervention. The participants were also asked to describe aspects of their alcohol-related incident, the perceived aversiveness of the incident, their attributions regarding how the incident occurred, and their motivation to change alcohol consumption as a result of the incident. Using path analysis, incident aversiveness was found to be related to previous alcohol use and incident attribution as well as motivation to change drinking behavior. Specifically, individuals who used alcohol more heavily prior to the incident rated the incident as less aversive. Individuals who attributed the incident to their responsibility rated the incident as more aversive. Finally, the more aversive a student found the incident, the more likely they reported a desire to change their alcohol consumption. Further, with logistical regression analyses, incident aversiveness demonstrated a direct path to motivation to change alcohol use.

The authors interpreted their findings as suggesting the possibility that the incident itself and/or the referral to a mandated intervention compelled some students to consider decreasing their alcohol consumption (Barnett et al., 2006). However, this interpretation is only conjecture because other extraneous but possibly relevant factors such as possibly social desirability were not accounted for in the study. Further, the
authors did not have a measure for motivation to change alcohol consumption prior to the incident so caution should be used when interpreting this finding as suggesting that the incident caused intentions to change.

Research has also highlighted the misguided assumptions that researchers and clinicians make regarding what we think college students deem as “negative” in terms of their perceptions of personal alcohol-related consequences. Mallet, Bachrach, and Turrisi (2008) conducted research which suggested that students may counter-intuitively judge some consequences, such as experiencing hangovers, as neutral or positive rather than negative.

In their study of 341 (55.1% women; 85.9% white; mean age = 18.5) first-year undergraduates, Mallet et al. (2008) asked respondents to self-report alcohol related consequences on the Young Adult Alcohol Problems Screening Test (YAAPST; Hurlbut & Sher, 1992) and to report their alcohol consumption with the Daily Drinking Questionnaire (DDQ; Collins, Parks, & Marlatt, 1985). They were also asked to assess how positive or negative the consequences were by rating their evaluations on a five-point Likert-type scale (Extremely Negative to Extremely Positive). In the final data analyses, the data were simplified down into one of three categories: negative, neutral, and positive. No rationale was provided for collapsing this evaluative data other than it “eased interpretation” (p.1377).

Consequences which were “infrequently” rated negatively (as indicated by being rated neutral by over 40% of the sample, and rated positive by more than 10% of the sample) included having a hangover (25% rated this consequence positive), waking up in someone else’s bed after drinking, leaving a party alone, binge-eating, and skipping a
meal. Consequences which were “less frequently” rated negative (as defined by being rated positive by more than 10% of the sample, but also rated neutral by over 30% of the sample) included experiencing a blackout (12% rated this consequence positive) and arriving late to class or work due to drinking the previous evening. Finally, consequences “frequently” perceived as negative (as indicated by being rated negative by the majority of respondents) included receiving a citation (92.5% rated negative), having property stolen, receiving a low grade due to drinking the night before an exam or paper was due, experiencing unintended sex, vomiting, acting socially inappropriately, and being embarrassed. Overall, there was no consequence which was universally judged to be negative (Mallet et al., 2008). These findings are important to the current research because they suggest that there is some variability with regard to what outcomes students perceive as being negative or in the case of the current study, “aversive.” It is important to know what constitutes “negative consequences” to college students because if interventions are to be successful at reducing high-risk alcohol consumption, then they need to emphasize consequences which students would actually find aversive.

A strength of Mallet and colleagues’ (2008) research is that it asked a previously unexamined question regarding distinctions among a variety of previously assumed negative alcohol-related consequences. Further, their study indicated that students who were heavier drinkers tended to rate the following consequences more positively: vomiting, unintended sex, being late to work/class, experiencing a blackout, skipping an evening meal, and experiencing a hangover. These findings could help inform interventions aimed at mandated populations because members of this group are generally considered to be heavier drinkers (Caldwell, 2002). For example, if heavier
drinkers do not perceive these particular consequences as negative, then interventions for this population should not incorporate a discussion of these consequences intending to motivate them to decrease their alcohol consumption because this may have the unintended effect of increasing the likelihood that students drink (Mallett et al., 2008). However, this study was limited because the authors did not provide the psychometrics of any of the measures they used, and they also didn’t describe their rationale for the heuristic used to categorize consequences. Further, it is unknown whether the individuals who chose to participate in this study were different from those who chose not to participate; their response rate was 55.5%.

**Alcohol expectancies.** A related line of research which examined underlying cognitive factors of alcohol behaviors is that focused on alcohol-related expectancies. For example, negative emotional expectancies about alcohol outcomes have been found to predict motivation to change alcohol-related behavior among binge-drinkers. Specifically, McNally and Palfai (2001) surveyed 152 undergraduates (49.3% women; mean age = 18.74) who reported at least one binge drinking episode in the past month. Though both positive and negative alcohol expectancies were measured, only negative alcohol expectancies contributed significantly to predicting motivation to change after controlling for quantity/frequency of alcohol use and alcohol related problems. These researchers interpreted their results as support for the hypothesis that negative expectancies are related to motivation to control alcohol use. Further analysis revealed that negative emotional expectancy was the primary significant predictor of motivation to change, and negative social, physical, and cognitive/performance expectancies were unrelated to motivation to change. The results of this study suggest that strengthening
negative alcohol expectancies, chiefly emotional expectancies, may be an appropriate goal for interventions which aim to change alcohol abuse.

**Anticipated regret.** In relation to the previous study, negative alcohol expectancies, and particularly negative emotional expectancies, have been hypothesized in other research to be theoretically similar to anticipated regret (Cooke, Sniehotta, & Schuz, 2007; Leigh & Stacy, 1991). Anticipated regret has been examined within the TPB as a possible predictor of alcohol-related behaviors. Anticipated regret appears to add another dimension, one more acknowledging of affect, to the theory of planned behavior. For example, the TPB has been critiqued for ignoring affective processes in determining behavior in spite of extant research suggesting that emotions frequently are involved when individuals make decisions about their actions (Connor & Armitage, 1998; Sandberg & Connor, 2008). As a result, some research has attempted to incorporate anticipated affective reactions with the TPB in order to explain attitudes and intentions particularly in contexts where consequences could be viewed as eliciting negative affect (e.g., Cooke, Sniehotta, & Schuz, 2007; Richard, van der Pligt, & de Vries, 1996).

Anticipated regret is an example of one such affect-laden variable which has been cited frequently in the TPB literature and appears most related to the aversiveness of consequence variable of interest in the current study. Sandberg and Connor (2008) provided the following definition of regret: “Regret itself is a negative, cognitive-based emotion that is experienced when we realize or imagine that the present situation could have been better had we acted differently” (p.590). Connor and Armitage (1998) noted that affective reactions, such as anticipated regret, can shape behavior when they are
made salient. This is relevant to the current study because mandated students who have recently experienced the outcomes of legal or university infractions may experience affective reactions which are deemed salient or more accessible.

Previous literature has supported the contention that anticipated regret is a unique variable separate from other predictors of the TPB (Conner, Graham, & Moore, 1999; Sheeran & Orbell, 1999). Studies have provided evidence that anticipated regret adds to the prediction of several behavioral intentions including exercise, engaging in casual sex, and binge drinking above and beyond the explanatory power of attitudes, subjective norms, and perceived behavioral control (see Conner & Abraham, 2001; Conner & Flesch, 2001; Cooke, Sniehotta, & Schuz, 2007). Indeed, a recent meta-analysis examining anticipated regret as an additional predictor in the TPB provided support for expanding the theory with such a variable (Sandberg & Conner, 2008).

Sandberg and Conner (2008) conducted a meta-analysis of 20 articles which utilized the TPB, a measure of anticipated regret, and reported sample-size weighted average correlations. The researchers described significant positive relationships for anticipated regret and intentions ($r = .47; 95\% CI = .19 - .74$), for anticipated regret and prospective behavior ($r = .28; 95\% CI = .06 - .50$), and for anticipated regret and attitude ($r = .35; 95\% CI = .02 - .68$). Finally, the meta-analysis indicated that the three primary TPB variables accounted for 30% of the variance in intentions; however, anticipated regret added another 7% to the variance explained above and beyond the usual TPB predictors. Overall, this meta-analysis provides a rationale for examining the impact of affective variables which may augment the predictive utility of the TPB.
Though this recent meta-analysis speaks to the possible merit of elaborating the TPB with affective variables such as anticipated regret, only one study to date has examined the role of anticipated regret with alcohol-related behavioral intentions (Cooke, Sniehotta, & Schuz, 2007). The outcome measure used in this study was notably different from other TPB research examining alcohol use because Cooke and colleagues assessed respondents’ intentions to “limit their drinking and avoid binge-drinking” (p. 85) rather than assessing their intentions to binge-drink. Binge-drinking was defined as “drinking at least half the recommended weekly alcoholic units in a single session, which entails 7 units for women and 10 units for men” (p. 86). This study was conducted in the United Kingdom and the authors did not provide a definition for a “unit” of alcohol.

Participants were 108 undergraduates (65 female; mean age = 20.28) who volunteered to complete a study of their drinking attitudes, intentions, and behaviors. The researchers found that intentions to limit drinking were significantly related to positive attitudes to limit alcohol consumption and also to greater regret if participants did not abide by their drinking limits. Using hierarchical regression, these researchers reported that anticipated regret was the strongest predictor of intentions ($\beta = .47, p < .001$). Therefore, the implications of this study suggested that if interventions are aimed at manipulating regret in participants, it may be possible to reduce the problem of binge-drinking.

Further, the overall results of this study demonstrated that the TPB variables accounted for 37% of the variance in intentions; with the addition of past behavior and anticipated regret, the final TPB model accounted for 58% of the variance in intentions to limit drinking. Attitudes were also a significant predictor of intentions ($\beta = .30; p < .001$). Consistent with previously described research, subjective norms failed to show predictive
power for intentions. This may be due to the authors adapting a subjective norms variable from previous research rather than seeking to identify important referents for the current population, which is a critique that has been explained elsewhere in this literature review. Additionally, likely due to lack of variation in perceived behavioral control responses (mean = 6.2 on a 7-point measure), perceived behavioral control failed to predict intentions or behavior (Cooke et al., 2007). Despite these limitations in measurement, this study adds to previous research by supporting the addition of affective variables to a TPB model used to predict intentions to limit binge-drinking.

The previously reviewed studies which highlight the benefits to understanding college students’ perceptions of their consequences (as described by perceived aversiveness of consequence, alcohol expectancies, and anticipated regret) may help researchers understand why some recent studies have found that mandated students are likely to change their alcohol-related behavior prior to any intervention (Morgan, White, & Mun, 2008; White, Mun, & Morgan, 2008). Though the authors of these studies did not assess for perception of consequence in their research, this could be an explanation for their findings.

**Alcohol-related infractions and behavior change.** A body of work has begun to explore the effects of alcohol-related infractions for eliciting behavior change among mandated college students (Morgan, White, & Mun, 2008; White, Mun, & Morgan, 2008). Typically, students who are cited for alcohol-related violations are required to attend some type of alcohol intervention by their university or by a referring court system. As such, a great deal of energy has been devoted to identifying effective evidence-based interventions for students who are required to participate in alcohol
programs. Though research has proliferated in the field of alcohol prevention and intervention over the past several decades, less is known about interventions which are effective for mandated populations (Barnett & Read, 2005). As noted earlier, mandated students represent a challenging population to serve and to study due to their involuntary participation in interventions (Martens et al., 2008). Further, while the majority of the research has focused upon identifying effective interventions, the influence of the sanctions has often been overlooked.

In an attempt to address this weakness in the extant research, Morgan, White, and Mun (2008) studied the impact that getting caught and sanctioned has on reductions of student drinking prior to mandated interventions. In one study of 175 mandated students (70% male; mean age = 18.8), a repeated-measures analysis of variance (ANOVA) was used to assess changes in alcohol consumption between two periods of time (30 days prior to the sanction, and 30 days prior to entering the alcohol program). Alcohol consumption was measured by total number of drinks consumed per week, peak Blood Alcohol Concentration (BAC), and alcohol frequency. Analyses demonstrated significant reductions on all three measures of alcohol consumption. The authors described the effect sizes as being between medium to large. The researchers also categorized the incident which led to sanctions as serious (requiring hospital visit or arrest) or not serious (residence hall violation) and found a significant incident seriousness by change in alcohol consumption interaction (effect sizes were both .07). Of note, the researchers made the determinations of level of seriousness of the incident, though it may have been helpful if they had sought that perception from their respondents.
Related to the current study’s purpose, Morgan and colleagues (2008) were unable to determine whether students’ affective and cognitive reactions to the sanction influenced their intentions to change their alcohol consumption because the researchers did not measure these variables. Another limitation of this study is that it is unclear whether the students’ changed their behavior as a result of the incident leading them to sanction or to the sanction itself because perceptions of these consequences were not assessed (Morgan et al.). In fact, because no theory was used in this study, there is no underlying framework which could provide insight into why students’ changed their behavior. Also, this study involved relying upon students’ memory to report their alcohol use 30 days prior to their infraction and 30 days prior to beginning the alcohol program. Students may have been somewhat motivated to exaggerate changes in their alcohol consumption. However, the study did not use a measure to assess for socially desirable responding, so ruling this confound out is not possible. The current study seeks to strengthen this literature by offering a theory of behavior which could serve to help us understand the underlying mechanisms of intended change and also by measuring social desirability.

**Summary of Perception of Consequence**

The research reviewed here revealed a few significant findings in regard to the impact that perception of consequence, namely the aversiveness of consequence, may have on behavioral intentions. First, researchers now have literature which speaks to the variability in perceived consequences for college students who experience alcohol-related incidents. This suggests the need to clarify the aspects of consequences that students find most aversive as a potential way in to facilitating students’ motivation to change their
drinking behaviors (Barnett et al., 2006; Mallet et al., 2008). More theoretically grounded research is needed so that we can understand how certain alcohol-related negative events cause behavior change. The current study seeks to build upon this previous research by utilizing the TPB as an explanatory model of alcohol-related behavioral intention. Further, affective variables such as negative emotional expectancies and anticipated regret, have both been identified as predictors of motivation to change alcohol use and moderate alcohol use (McNally & Palfai, 2001; Sandberg & Connor, 2008). The current study hypothesizes that aversiveness of consequence is an affective variable which predicts intention to drink to intoxication above and beyond the TPB variables.

**Summary**

Mandated college students have been described as being at particular risk for future alcohol-related problems and, as such, selective prevention efforts and interventions should be aimed at this population (Caldwell, 2002; Larimer & Cronce, 2002; Martens et al., 2008). However, due to challenges in conducting research with this population (e.g., involuntary status and stringent research ethics which limit access to samples) little is known about the underlying antecedents and predictors of alcohol-related behaviors for these students (Barnett & Read, 2005). Therefore theoretically grounded research is greatly needed to shed light on the factors that are associated with alcohol use/abuse in mandated students.

The theory of planned behavior recently has been proposed by counseling psychologists as offering a framework from which to explain behavior and as a model which can be used effectively to develop and evaluate interventions (Romano & Netland,
The present literature review demonstrated that the TPB has a strong history in its applications to a wide range of behaviors (Godin & Kok, 1996) and specifically to explaining and predicting college alcohol-related intentions and behaviors (Johnston & White, 2003; Norman et al., 1998; Wall et al., 1998). The literature currently lacks, however, a test of the TPB model in a sample of college students who are mandated to alcohol intervention. Therefore, the current research aimed to contribute to the existing college alcohol abuse literature by identifying whether the theory of planned behavior can predict intentions to drink to intoxication among a sample of college students who are mandated to intervention. Figure 2 depicts the expected associations among the TPB variables and intention to drink to intoxication which relates to the first hypothesis of this study.

![Hypothesized TPB Model](image)

**Figure 2**

Hypothesized TPB Model
Additionally, previous authors have reported a consistent and purportedly strong positive relationship between alcohol-related behaviors and impulsivity (Baer, 2002; Brennan et al., 1986). Nevertheless, limited research has attempted to assess impulsivity within the TPB (Churchill et al., 2008) and no research has assessed the role of impulsivity in explaining alcohol-related intentions in the TPB. Ajzen (2001) contended that personality variables (such as impulsivity) should be a distal factor in the TPB, having no direct effects on behavior, but, recent research challenged that postulation and suggested that personality directly affects exercise and health-protective behaviors, extending beyond the variance that the TPB alone explains in these criterion variables (Conner & Abraham, 2001). Therefore, the current research added to the TPB literature by being the first study to integrate impulsivity into the model for the purposes of adding variance explained in mandated students’ intentions to drink to intoxication. Figure 3 represents the expected additive contribution of impulsivity to the TPB model in predicting intentions to drink to intoxication among college students mandated to alcohol intervention which relates to the second hypothesis in this study.

Another variable expected to augment the TPB is perceived aversiveness of consequence (Barnett et al., 2006). The TPB has been criticized for overlooking the significance of affective processes in motivating behavior. The current study proposes to measure the influence of aversiveness of consequence alongside the primary TPB cognitive variables. Aversiveness of consequence is expected to perform similarly to anticipated regret in the model. Previous research demonstrated that anticipated regret uniquely accounted for variance in behavioral intentions above and beyond that which was accounted for by the TPB (Conner et al., 1999). Aversiveness of consequence is
conceptualized as being similar to, but separate from, anticipated regret because it is not the worry over a future/possible regret which is at issue in this study, but rather beliefs that may be primed due to the students having experienced a legal consequence recently. Therefore, the current study aims to make a contribution to the TPB literature by adding aversiveness of consequence into the TPB model for the purposes of increasing the variance explained in mandated students’ intentions to drink to intoxication. Figure 4 depicts the expected contribution that perceived aversiveness of consequence will make to the TPB model.

Figure 3
Extended TPB Model with Impulsivity
Hypotheses

Hypothesis 1
Attitude toward drinking to intoxication, subjective norm, and perceived behavioral control together significantly predict intention to drink to intoxication for college students who have been mandated to intervention. This hypothesis is based on the extensive previous work that demonstrated the TPB’s ability to predict alcohol-related intention in
Hypothesis 2

Impulsivity explains unique variance in intentions to drink to intoxication above and beyond the variance explained by the TPB variables of attitude toward drinking to intoxication, subjective norm, and perceived behavioral control among a sample of mandated college students. This hypothesis is based on research that demonstrated a significant positive relationship between impulsivity and alcohol-related behavior (e.g., Baer, 2002; Brennan et al., 1986) and research that demonstrated impulsivity as a predictor of behavior in the TPB (Churchill et al., 2008).

Hypothesis 3

Aversiveness of consequence explains unique variance in intention to drink to intoxication above and beyond the TPB variables of attitude toward drinking to intoxication, subjective norm, and perceived behavioral control among a sample of mandated college students. This hypothesis is based on research that demonstrated similar constructs (e.g., anticipated regret) added predictive validity to the TPB model in explaining alcohol-related behaviors and that aversiveness of consequence is related to motivation to change alcohol-related behaviors (Barnett et al., 2006; Sandberg & Conner, 2008).
CHAPTER III
METHODOLOGY

Participants

Based upon previous literature, an $R^2$ of .55 (Ajzen, 1991; Armitage & Conner, 2001; Godin & Kok, 1996; Huchting, Lac, & LaBrie, 2008; Johnston & White, 2003) was expected for the test of the TPB model outlined in Hypothesis 1. Additionally, given the literature linking impulsivity and aversiveness of consequence to alcohol use, these variables each were expected to have a medium effect when added to the TPB model per Hypotheses 2 and 3. Therefore, for the two step hierarchical regressions with three variables entered at step one and a single variable with a medium effect ($f^2 = .15$) entered at step two, when alpha is set at .05 and with a desired power of .90, 74 participants were required for the test of the increment to $R^2$ (http://www.danielsoper.com/statcalc/calc16.aspx).

A total of 85 undergraduate students at a large Midwestern university who were referred to the counseling center for alcohol intervention initially participated in this study. These participants are termed mandated students as they were required to attend an alcohol intervention due to alcohol-related legal infractions or an alcohol-related policy violation on University property. This sample consisted of 83% of the 102 students who were originally sought for participation; 17 students chose not to participate.
in the study. Eight other participants’ data were not included in data analyses because they did not complete all of the instruments or they demonstrated indiscriminate responding as indicated by endorsing all 1’s or all 7’s. Therefore, the final sample consisted of 77 participants. Notably, this sample of undergraduates derives from a Big-Ten University of 40,000 students in which heavy emphasis upon athletics and a large Greek population contribute to an omnipresent drinking environment.

There were 55 (71%) men and 22 (29%) women in this sample. Participants ranged in age from 18 to 23, with an average age of 19.53 (SD = 1.0) years. In terms of race, 67 (87%) of the participants identified as White, 4 (5.2%) identified as Hispanic or Latino American, 4 (5.2%) identified as an International Student, 1 (1.3%) identified as biracial/multiracial, and 1 (1.3%) identified as Asian American. First year students made up 39% (n = 30) of the sample, 35.1% (n = 27) were sophomores, 19.5% (n = 15) were juniors, and 6.5% (n = 5) were seniors. Of the 77 participants, 76 (98.7%) were court-referred and 1 (1.3%) was referred by university residences. Further, 75 (97.4%) participants reported that this was their first alcohol related offense, and 2 (2.6%) reported that they had one previous offense.

TPB Instrument Design

Two instruments were created to measure the TPB variables for this study: the Beliefs survey and the Theory of Planned Behavior (TPB) questionnaire. Ajzen (2006) and Francis et al. (2004) have provided manuals for developing TPB questionnaires and both were consulted in this study. The TPB questionnaire assesses the direct measures of TPB which include intention, attitude, subjective norm, and perceived behavioral control. The Beliefs survey assesses the indirect measures of the TPB which represent the
underlying beliefs of the direct measures. For the direct measure of attitude, the indirect measure is *behavioral beliefs*. For the direct measure of subjective norm, the indirect measure is *normative beliefs*. For the direct measure of perceived behavioral control, the indirect measure is *control beliefs*. Following the recommendation of Francis et al. (2004), a series of simple bivariate correlations between direct and indirect measures of the same constructs were computed, to “confirm the validity of the indirect measures” (p. 30).

The current TPB questionnaire and the Beliefs survey were constructed for the specific population and the target behavior of interest to this study, as recommended by Ajzen (2006). The specific population is college students mandated for alcohol intervention. The specific behavior is “*drinking to intoxication while in college.*” Ajzen suggested that behavior be defined by a) action, which in the current study is “*drinking;*” b) target, in this study it is “*to intoxication;*” c) context, in this study it is defined by “*while in college;*” and d) time, which is not specified in this study because any time college students drink to intoxication they put themselves at risk for harm.

Two preliminary studies were conducted using the TPB framework following Ajzen’s recommendations (2006) in order to develop the Beliefs survey and the TPB questionnaire. Ajzen refers to this first phase of study as formative research. The first study was a qualitative elicitation study which was used to develop the Beliefs survey by identifying the belief constructs which underlie the more primary direct measures of attitude, perceived behavioral control, and subjective norm. According to Ajzen (2006) and Francis et al. (2004), to construct a population-specific Beliefs survey, an elicitation study should be done first to identify the salient behavioral, normative, and control
beliefs which should positively correlate to the direct measures of attitude, subjective norm, and perceived behavioral control respectively. The second study involved pilot testing the reliability and validity of the TPB questionnaire and the Beliefs survey. Institutional Review Board approval was obtained prior to the elicitation study and pilot study.

The procedure for the elicitation study is explained first, and then the process for the pilot study is explained. The construction of the Beliefs survey and the TPB questionnaire are detailed in the Instruments section of this chapter.

**Elicitation study.** In accordance with manuals for TPB studies, a sample of 25 students mandated for alcohol intervention took part in an elicitation study in the formative phase of this research (Ajzen, 2006; Francis et al., 2004). Participants were 20 (80%) men and 5 (20%) women. The mean age of the sample was 19.24 years. In terms of race, 20 participants were White (80%), 4 were biracial (15%), and 1 was African American (4%). First-year students were 12 participants (48%), 7 participants were sophomores (28%), 5 participants were juniors (20%), and 1 participant was a senior (4%). Of the 25 participants, 22 (88%) were court mandated and 3 (12%) were mandated by university residences.

Nine open-ended items were used to uncover the behavioral beliefs, normative beliefs, and control beliefs for this specific population. Identifying these beliefs allowed for indirect measures of the predictors to be constructed which describe the “underlying cognitive and affective foundations for attitudes, subjective norms, and perceptions of behavioral control” (Ajzen, 2006, p.7). Respondents answered the series of open questions regarding their beliefs related to “drinking to intoxication.” Students from this
population were asked prior to the elicitation study, what behavioral markers they identified as suggesting a person is intoxicated. Intoxication was defined as displaying any of the following signs: drinking to “get drunk,” slurred speech, loss of coordination, loss of balance, inability to focus vision, very loud behavior, or very withdrawn behavior. The 9-item elicitation questionnaire is presented in Appendix C.

Following Ajzen’s guidelines, two independent raters content-analyzed the qualitative data gathered from the elicitation study. An advanced-level graduate student and I completed this task and independently identified themes for each of the three types of beliefs from the elicitation questionnaire. The elicited beliefs were grouped by similar themes, counted, and ordered by frequency so the final Beliefs survey would include the most frequently held beliefs from the population of interest. Table 1 summarizes the results of the elicitation study.

Themes were primarily consistent across the two coders (96% agreement) with only initial discrepancy over two themes. For example, we initially disagreed about whether “stress relief” and “relaxation” should be considered two separate themes or collapsed into one theme. Discrepancies regarding these two themes were discussed to reach agreement; it was decided that the themes were slightly different and thus considered independent themes. In accordance with Ajzen’s recommendations, the top 75% of elicited themes were used to create the Beliefs survey items. Construction of all items for the Beliefs survey and their scoring are explained in the instruments section of this chapter and correspond to directions from the manuals developed by Ajzen (2006) and Francis et al. (2004).
Table 1

Elicitation Study Beliefs \((n = 25)\)

<table>
<thead>
<tr>
<th>Themes (Behavioral Beliefs)</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Advantages</strong></td>
<td></td>
</tr>
<tr>
<td>Socialization opportunities</td>
<td>17</td>
</tr>
<tr>
<td>Fun</td>
<td>14</td>
</tr>
<tr>
<td>Meeting new people</td>
<td>12</td>
</tr>
<tr>
<td>Relaxation</td>
<td>4</td>
</tr>
<tr>
<td>Stress reduction</td>
<td>4</td>
</tr>
<tr>
<td>Something “to do”</td>
<td>3</td>
</tr>
<tr>
<td>Acceptance from peers</td>
<td>1</td>
</tr>
<tr>
<td>To “brag”</td>
<td>1</td>
</tr>
<tr>
<td>Sex</td>
<td>1</td>
</tr>
<tr>
<td><strong>Disadvantages</strong></td>
<td></td>
</tr>
<tr>
<td>Poor grades</td>
<td>11</td>
</tr>
<tr>
<td>Legal problems</td>
<td>8</td>
</tr>
<tr>
<td>Hangovers</td>
<td>5</td>
</tr>
<tr>
<td>Make bad decisions</td>
<td>4</td>
</tr>
<tr>
<td>Health risks</td>
<td>4</td>
</tr>
<tr>
<td>Spending money</td>
<td>4</td>
</tr>
<tr>
<td>Missing classes</td>
<td>2</td>
</tr>
<tr>
<td>Being embarrassed</td>
<td>2</td>
</tr>
<tr>
<td>Relying on alcohol to solve problems</td>
<td>1</td>
</tr>
<tr>
<td>Weight gain</td>
<td>1</td>
</tr>
<tr>
<td>Social drama</td>
<td>1</td>
</tr>
<tr>
<td>Relationship problems</td>
<td>1</td>
</tr>
<tr>
<td>Risk for sexual assault</td>
<td>1</td>
</tr>
<tr>
<td>Employment problems</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Themes (Normative Beliefs)</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Approve</strong></td>
<td></td>
</tr>
<tr>
<td>Friends</td>
<td>19</td>
</tr>
<tr>
<td>Other College Students</td>
<td>9</td>
</tr>
<tr>
<td>Parents</td>
<td>9</td>
</tr>
<tr>
<td>Siblings</td>
<td>3</td>
</tr>
<tr>
<td>Resident Assistants</td>
<td>2</td>
</tr>
<tr>
<td>Fraternity/Sorority</td>
<td>1</td>
</tr>
<tr>
<td>Siblings</td>
<td>1</td>
</tr>
<tr>
<td>Everyone</td>
<td>1</td>
</tr>
<tr>
<td>Aunts/Uncles</td>
<td>1</td>
</tr>
<tr>
<td><strong>Disapprove</strong></td>
<td></td>
</tr>
<tr>
<td>Parents</td>
<td>15</td>
</tr>
<tr>
<td>Professors</td>
<td>15</td>
</tr>
<tr>
<td>Religious Leaders</td>
<td>7</td>
</tr>
<tr>
<td>Police</td>
<td>2</td>
</tr>
<tr>
<td>Employer</td>
<td>1</td>
</tr>
<tr>
<td>Girlfriend/Boyfriend</td>
<td>1</td>
</tr>
</tbody>
</table>
Table 1 (Continued)

Elicitation Study Beliefs ($n = 25$)

<table>
<thead>
<tr>
<th>Control Beliefs (Perceived Behavioral Control)</th>
<th>Facilitate</th>
<th>Interfere</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control Beliefs</td>
<td>Parties</td>
<td>Heavy course load</td>
</tr>
<tr>
<td>Easy access to alcohol</td>
<td>8</td>
<td>Difficult classes</td>
</tr>
<tr>
<td>Having friends who drink</td>
<td>7</td>
<td>Exams</td>
</tr>
<tr>
<td>Having friends over 21</td>
<td>5</td>
<td>Discouragement by friends</td>
</tr>
<tr>
<td>Free time</td>
<td>2</td>
<td>No access to alcohol</td>
</tr>
<tr>
<td>Living in apartment off campus</td>
<td>2</td>
<td>Under 21</td>
</tr>
<tr>
<td>Being over 21</td>
<td>1</td>
<td>Living in residence hall</td>
</tr>
<tr>
<td>Friends in fraternities/sororities</td>
<td>1</td>
<td>Family live near by</td>
</tr>
<tr>
<td>No curfew</td>
<td>1</td>
<td>Thinking about consequences</td>
</tr>
<tr>
<td>Sporting events</td>
<td>1</td>
<td>No transportation</td>
</tr>
<tr>
<td>Living on own</td>
<td>1</td>
<td>“Ladies’ nights”</td>
</tr>
</tbody>
</table>

**Pilot study.** The Beliefs survey and the initial TPB Questionnaire were assessed for item comprehension by 10 counseling center staff members (8 women and 2 men). Recommendations and observations were provided regarding item repetition, survey length, and item wording. Then the revised questionnaire was piloted on a small sample of 13 college students who had been referred to the counseling center for alcohol intervention by the local court system and thus were from the target population of interest to this study. These participants were 9 men (69.2%) and 4 women (30.8%). The mean age of the sample was 19.80 years ($SD = 1.83$). In terms of race, 11 participants were
White (84.6%) and 2 were Hispanic/Latino American (15.4%). Of the 13 participants, 4 were first year students (30.8%), 5 were sophomores (38.5%), 2 were juniors (15.4%) and 2 were seniors (15.4%). All of these participants were court-referred. Further, 92.3% (n = 12) of the sample reported that this was their first alcohol-related offense and 7.7% (n = 1) reported that this was their second offense.

In addition to completing the surveys, these students were asked to provide open-ended feedback regarding survey comprehension, repetition, length, and item wording. Based upon feedback from participants, some minor changes to wording were made such as adding legal guardian to questions relating to parents. See Appendix L for these participants' comments. In their open-ended responses, participants agreed that the TPB questionnaire and the Beliefs Survey captured the variables which they consider when drinking alcohol to intoxication and they did not offer further suggestions which would have required adding new items.

In Francis and colleagues’ (2004) detailed manual for the development of a questionnaire based upon the TPB, they suggested using an index of internal consistency to establish the TPB questionnaire’s reliability in explaining behaviors. Through conducting an item analysis by computing internal consistency alphas on the pilot sample of 13 participants, 4 items were dropped from the TPB questionnaire in order to improve the alphas. Specifically, 3 items were removed from the original subscale for attitude, and 1 item was removed for perceived behavioral control. The final resulting TPB survey consisted of 19 items. Analyses of these items revealed adequate internal consistency reliability coefficients for the pilot TPB questionnaire scales (i.e., Intentions, α = .96; Attitude, α = .72; Subjective Norm, α = .86; and Perceived Behavioral Control, α
Item analysis was not conducted on the Beliefs survey following instructions from the TPB manual. According to Francis and colleagues, “people can quite logically hold both positive and negative beliefs about the same behavior, [therefore] it is not appropriate to assess the reliability of indirect measures using an internal consistency criterion” (p. 9).

**Instruments**

**Beliefs Survey – Indirect Measures.** The Beliefs survey consisted of 40 items and is presented in Appendix D. Following recommendations by Ajzen (2006), all items are rated on 7-point Likert-type scales. As stated above, internal consistency alphas are not reported for the indirect measures relating to the underlying beliefs of the theory of planned behavior. The Beliefs survey assesses three constructs which constitute indirect measures of the TPB: behavioral beliefs, normative beliefs, and control beliefs.

**Behavioral Beliefs (Attitude).** Behavioral beliefs relate to the attitude variable in the TPB. Themes for behavioral beliefs included both advantages and disadvantages of drinking to intoxication which correspond to outcome expectancies for the behavior. Eleven themes were identified. By report of the participants, the most common advantages to getting drunk included: social opportunities, fun, meeting new people, relaxation, and stress relief. The most common disadvantages to getting drunk included: poor grades, legal problems, hangovers, bad decisions, increased health risks, and financial costs.

Ajzen (2006) suggested that these themes can be made into statements about the likelihood of the expected outcomes and corresponding items are created to assess the participant’s evaluations of the outcomes. Overall, 22 items were developed for this
indirect measure of attitude. For example, the theme *fun* was constructed into the item, *If I get drunk while I’m in college, I will have fun*, rated from Unlikely (1) to Likely (7); an example of the corresponding outcome evaluation item is, *Having fun in college is: *Extremely Undesirable (1) to Extremely Desirable (7). For each of the 11 themes, belief strength is multiplied by the corresponding outcome evaluation and then all items are summed to create a total score. Behavioral Beliefs scores could range from 11 to 539.

**Normative Beliefs (Subjective Norm).** Normative beliefs relate to the subjective norm variable in the TPB. Normative belief items assessed participants’ expectations about important others who would approve or disapprove of the participant getting drunk, and also the participants’ motivation to comply with these referents. Individuals who participants most commonly reported would approve of them getting drunk included: friends, parents, and other students. Participants most commonly reported the following referents would disapprove of them getting drunk: parents, professors, and religious leaders.

Normative beliefs were measured by asking respondents to rate to what extent each referent would agree that they should get drunk while in college. For example, *My friends think I should get drunk while I’m in college*. These items were rated from Strongly Disagree (1) to Strongly Agree (7). An example of a corresponding motivation to comply item is, *What my friends think about my drinking behavior matters to me*. These items were rated from Not at All (1) to Very Much (7). Normative beliefs are scored by multiplying each motivation to comply item with its corresponding normative statement and adding these numbers for a total score. Overall, 10 items were developed
for this indirect measure of subjective norm. Normative Beliefs scores could range from 5 to 245.

**Control Beliefs (Perceived Behavioral Control).** Control beliefs relate to the perceived behavioral control variable in the TPB. Control beliefs assessed factors that would facilitate or interfere with participants getting drunk. Themes reported to facilitate getting drunk included: availability of parties, having friends who drink, having friends over 21, easy access to alcohol, free time, sporting events, stress, peer pressure, and having an apartment/house off campus. Factors reported to inhibit getting drunk included: a heavy course load, difficult classes, friends who discourage heavy drinking, exams, and limited access to alcohol.

According to Francis et al. (2004), for the control beliefs measure, themes from the elicitation study are converted into statements that “should reflect the beliefs which might make it difficult to perform (or not perform) the target behavior” (p. 23). Therefore, items corresponding to the reported factors that hindered getting drunk were constructed and power of the control belief to inhibit the behavior was assessed by asking how frequently each of these obstacles were present. An example of a control belief item is, *If I had difficult classes, I would get drunk less often while I’m in college.* Items were rated from Strongly Disagree (1) to Strongly Agree (7). A corresponding item which assessed the power of difficult classes to inhibit drinking to intoxication is, *How often do difficult classes put significant demands on your time?* Items are rated from Very Rarely (1) to Very Frequently (7). Each control belief item is multiplied by its corresponding power to inhibit the behavior item and then all items are summed to create an overall indirect measure of perceived behavioral control score. Therefore, 8 items were
developed for this indirect measure of perceived behavioral control. Control Beliefs scores could range from 4 to 196.

**TPB Questionnaire – Direct Measures.** The TPB questionnaire for this research is a 19-item survey that assesses 4 constructs which constitute the *direct* measures of the TPB: intentions, attitude, subjective norm, and perceived behavioral control. Items were developed in consultation with the TPB manuals from Francis et al., (2004) and Ajzen (2006). Again all items are rated on a 7-point Likert-type scale. The TPB questionnaire is presented in Appendix E.

**Intention.** Intention to drink to intoxication is the dependent variable in this study. Intention is measured with 4 questions assessing the individual’s expectation, desire, and intention to drink to intoxication while in college. Examples of items include, *I expect to get drunk while I’m in college,* and *I want to get drunk while I’m in college.* All items are rated from Strongly Disagree (1) to Strongly Agree (7). Items are summed and the mean reflects the strength of intention to perform the behavior. Higher scores indicate stronger intention to drink to intoxication while in college. Cronbach’s alpha for the TPB intention scale for the current study was .97. This is consistent with previous research which used the TPB to explain variance in alcohol-related behaviors among undergraduates and reported internal consistency reliabilities for intention ranging from .67 to .94 (Johnston & White, 2003; Norman, Armitage, & Quigley, 2007).

**Attitude.** In accordance with Ajzen’s (2006) recommendations, construction of these items involved the use of 4 bipolar adjectives rated on 7-point Likert-type scales (e.g., *Getting drunk while I’m in college is: Very Unpleasant (1) – Very Pleasant (7)).* The mean total score reflects overall attitude, with higher numbers indicating a more
positive attitude toward drinking to intoxication. Cronbach’s alpha for the TPB attitude scale for the current study was .76. This is consistent with previous research which demonstrated Cronbach’s alphas ranging from .72 to .94 for alcohol-related behaviors (Cooke, Sniehotta, & Schuz, 2006; Johnston & White, 2003; Norman, Bennet, & Lewis, 1998; Norman, Armitage, & Quigley, 2007; Wall, Hinson, & McKee, 1996).

**Subjective Norm.** Subjective norm was measured with 6 items assessing general feelings of social pressure to perform a target behavior (e.g., *I feel under social pressure to get drunk while I’m in college* and *The people in my life whose opinions I value would approve of me getting drunk*). Items were scored on a 7-point Likert-type scale from Strongly Disagree (1) to Strongly Agree (7). Scores are the mean of the 6 items reflecting subjective norm, with higher numbers indicating more subjective pressure to drink to intoxication. Cronbach’s alpha for the TPB subjective norm scale for the current study was .79. This is consistent with comparable research which demonstrated alphas ranging from .78 to .91 for alcohol-related behaviors (Collins & Carey, 2007; Murgraff, McDermott, & Walsh, 2001).

**Perceived Behavioral Control.** Perceived behavioral control was assessed via 5 items reflecting one’s confidence to perform/or avoid the behavior and the amount of control the person feels (e.g., *The decision to get drunk is out of my control*). Items are rated on a 7-point Likert-type scale from Strongly Disagree (1) to Strongly Agree (7). The mean of the 5 items represents the overall strength of control. Cronbach’s alpha for the TPB perceived behavioral control scale for the current study was .71. This was consistent with previous research which showed internal consistency reliabilities to range from .57 to .78 for perceived behavioral control (Johnston & White, 2003; Murgaff,
McDermott, & Walsh, 2001; Norman, Bennett, & Lewis, 1998; Norman, Armitage, & Quigley, 2007).

**UPPS Impulsive Behavior Scale (Whiteside & Lynam, 2001).** The UPPS is a 45-item self-report scale that was developed to measure the multidimensional concept of impulsivity. The UPPS measure is presented in Appendix F. The measure was constructed from a factor analysis of facets related to impulsivity from the NEO-PI-R (Costa & McCrae, 1992) and frequently used impulsivity measures (e.g., Barratt Impulsiveness Scale-II, Patton, Stanford, & Barratt, 1995; Temperament and Character Inventory, Cloninger, Przybeck, & Svrakic, 1991; Sensation Seeking Scale, Zuckerman, 1994). The UPPS has four subscales that include Urgency (12 items), Premeditation (11 items), Perseverance (10 items), and Sensation-Seeking (12 items).

Urgency is defined as, “the tendency to experience strong impulses, frequently under conditions of negative affect” (p. 685). The Urgency scale includes items such as, *It is hard for me to resist acting on my feelings.* Premeditation is defined as, “the tendency to think and reflect on the consequences of an act before engaging in that act” (p. 685). The Premeditation scale includes items such as, *I have a reserved and cautious attitude toward life.* Perseverance is defined as “a person’s ability to remain focused on a task that may be boring or difficult” (p. 685). The Perseverance scale includes items such as, *I generally like to see things through to the end.* Sensation Seeking involves both “a tendency to enjoy and pursue activities that are exciting and an openness to trying new experiences that may or may not be dangerous” (p.686). The Sensation Seeking scale includes items such as, *I’ll try anything once, and I would enjoy fast driving.* Each item is rated from Agree Strongly (1) to Disagree Strongly (4) on a Likert-
type scale and items for subscales are then averaged. Items on the Sensation Seeking scale and the Urgency scale are reverse scored so that higher scores indicate more impulsivity. The total Impulsivity score is the sum of the four subscale scores. The total impulsivity scores could range from 4 to 16.

The psychometric properties of the UPPS have been shown to be strong in past research. The UPPS has demonstrated good reliability with strong internal consistencies for Premeditation (α = .91), Urgency (α = .86), Sensation-Seeking (α = .90), and Perseverance (α = .82) (Whiteside & Lynam, 2001). In the current study, adequate internal consistency alphas were demonstrated for Premeditation (.85), Urgency (.89), and Perseverance (.79). The Sensation-Seeking subscale showed a weaker internal consistency alpha than that reported in the validation study (α = .68). The UPPS total impulsivity scale score evidenced adequate reliability in the present sample as well (α = .86) and this is consistent with recent research which demonstrated the average internal consistency of .87 for the composite score (Kampfe & Mitte, 2009); however, Verdejo-Garcia and colleagues (2010) reported a much stronger internal consistency alpha of .94 for the global UPPS score. Convergent validity has been supported in research showing the UPPS scales correlate with conceptually similar scales. Specifically, Whiteside and Lynam (2001) reported that Urgency loaded highly with the impulsivity facet from the NEO-PI-R (.74), Perseverance loaded highly with the self-discipline facet of the NEO-PI-R (.63), Premeditation loaded highly with the NEO-PI-R deliberation facet (.70), and Sensation Seeking loaded highly with the excitement seeking facet of the NEO-PI-R (.74). Further, discriminant validity was demonstrated through factor analysis which
showed that the average divergent item-total correlations among the 4 factors ranged from .05 to .33 with and a mean of .17.

Whiteside and Lynam (2003) reported that Urgency and Sensation-Seeking are the impulsive-behavior traits most strongly related with alcohol abuse. In a follow-up study to their original research, they reported that the UPPS differentiated alcohol abusers from a control group in a treatment seeking sample. The internal consistency alphas also demonstrated good reliability with Premeditation ($\alpha = .87$), Urgency ($\alpha = .89$), Sensation Seeking ($\alpha = .85$), and Perseverance ($\alpha = .83$). These findings regarding relations to alcohol use were also supported by Magid and Colder (2007) who reported individuals high on Sensation-Seeking and low on Premeditation consumed more alcohol, but those scoring high on Urgency but low on Perseverance were likely to face more alcohol-related problems. The four factor model explained 18% of the variance in alcohol use and 40% of the variance in alcohol problems (Magid & Colder). The researchers reported that the subscales showed good internal consistencies ranging from .81 to .88, though they did not specify the alphas for each subscale. Because historically impulsivity has been treated as a unidimensional trait in alcohol abuse research (Grano, Virtanen, Vahtera, Elovainio, & Kivimaki, 2004; Grau & Ortet, 1999; Waldeck & Miller, 1997), the global UPPS score was initially tested in the TPB model (Verdejo-Garcia et al., 2010); however, exploratory research utilizing the four subscales of the UPPS were also conducted due to the more recent research suggesting that impulsivity is a multidimensional construct (Magid & Colder; Whiteside & Lynam, 2001, 2003).

**Aversiveness of Consequence Scale.** Aversiveness of consequence items for this research were adopted from Barnett et al.’s (2006) study which assessed the perceived
aversiveness of alcohol related incidents. For the current study, items measuring consequence aversion included, *To what extent has this incident upset you?*, *When thinking about this incident, how badly do you feel about it?* and *How unpleasant has this incident been for you?* The items are scored on a 7-point Likert-type scale ranging from Not at All (1) to Very Much (7). Mean scores were calculated for analyses.

In Barnett et al. (2006), the alpha coefficient for the three items was .89, demonstrating strong internal consistency. In a more recent article by Barnett et al. (2008), alphas for 3 subsequent studies which used the aversiveness of consequence scale were reported to range from .77 to .85. The alpha coefficient for the current study was .70. No validity evidence was reported by Barnett et al. (2006, 2008), but aversiveness was significantly positively correlated to number of drinks consumed during the critical incident ($r = .17, p < .05$), and the more responsibility the students felt for the incident, the more aversive they found the incident ($r = .24, p < .001$). Aversiveness was also significantly correlated to motivation to change drinking behavior ($r = .31, p < .01$) (Barnett, et al.). The Aversiveness of Consequence Scale is presented in Appendix G.

**Balanced Inventory of Desirable Responding, Version 6 (BIDR; Paulhus, 1984, 1991).** Research has suggested that self-reports tend to provide accurate drug-use data (Darke, 1998; Laforge, Borsari, & Baer, 2005). Marlatt and colleagues (1998) conducted a study for the purpose of identifying patterns of underreporting or minimizing alcohol use in a college student sample, and demonstrated that participant reports were consistent with collateral reports. However, the current sample may be particularly apt to respond in a socially desirable way because they were mandated for treatment and to date there has been no research assessing socially desirable responding in a mandated sample.
Therefore, to account for invalid self-reported responses, the Balanced Inventory of Desirable Responding (BIDR; Paulhus, 1984, 1991) was used. The BIDR is presented in Appendix H.

The BIDR measures two constructs which are related to socially desirable responses: self-deceptive enhancement (people high on this scale believe in their overly positive self-reports) and impression management (people high on this scale deliberately present themselves in a favorable light). Both scales are 20 items and are relevant for the present research because participants may have been motivated to report fewer alcohol intentions due to their mandated status and self-deception may be relevant for participants who do not consciously realize the extent of their alcohol abuse. Items are endorsed on a 7-point Likert-type scale, ranging from Not True (1) to Very True (7). Half of the items are reverse scored and one point is added for all items that have a 6 or 7-point response. Items which are endorsed with a number lower than 6 are assigned zero points. This ensures that only people who give extreme responses attain high scores. The subscale scores are determined by adding the assigned points for each item on the subscale; therefore subscale scores range from 0 – 20. The overall BIDR score is obtained by summing the points for both subscales; therefore the overall BIDR score ranged from 0 – 40.

The BIDR is correlated significantly with other measures of social desirability (e.g., .71 with the Marlowe-Crown Social Desirability Inventory and .80 with the Multidimensional Social Desirability Inventory, Paulhus, 1991). Test-retest correlations over a 5-week period for these subscales were adequate, having been reported as .69 (self-deception) and .65 (impression management) (Paulhus, 1991). The overall BIDR
score has also shown good internal consistency with a reported $\alpha = .83$ (Paulhus, 1991). The two subscales showed adequate internal consistency reliability as well; in a study of 433 undergraduates, the self-deception scale demonstrated alpha coefficients ranging from .68 to .80 and the impression management scale demonstrated alpha coefficients ranging from .75 to .86 (Paulhus). In more recent research, Li and Bagger (2007) reported satisfactory mean coefficient alphas based upon their reliability generalization analysis of 110 studies. They reported the following mean coefficient alphas: impression management (.74), self-deception (.68), and overall BIDR (.80). Other research which examined the gambling behaviors of college students and problem gamblers (Kuentzel, Henderson, & Melville, 2008) reported the impression management scale alpha coefficients ranging between .76 and .81 for students and gamblers respectively. The self-deception scale however showed alphas ranging from .47 to .70 for students and gamblers. Another study which used only the impression management scale with a sample of child abusers demonstrated somewhat stronger coefficient alphas for nonsexual abusers (.89) and child molesters (.88) (Nunes, Firestone, & Baldwin, 2007). The overall internal consistency as indicated by coefficient alpha in the current study was .74. The internal consistency for the impression management subscale in this study was .70 and for the self-deception subscale was .69. Due to research which has recently shown statistically significant associations between socially desirable responding (as measured by the total BIDR score) and alcohol problems ($r = -.38$), high-risk alcohol use ($r = -.36$), and substance addiction ($r = -.39$), the total BIDR score was used in the current study (see Zaldivar, Molina, Rios, & Montes, 2009).
Demographic survey. The following data were collected to describe the sample: age, sex, self-identified race, academic standing, number of previous alcohol-related violations, and referral source. Data were also collected regarding the participants’ drinking styles including frequency and amount of alcohol consumption on a typical occasion. Participants also indicated the month and year of the alcohol-related incident which led to their referral to the alcohol intervention. The demographic survey is presented in Appendix I.

Procedure

Participants for the main study were recruited from alcohol intervention classes at a large Mid-western university. These alcohol intervention classes consist of college students who have been mandated to intervention due to alcohol related offenses. Voluntary participation from students was sought prior to the arrival of the alcohol instructor for the alcohol intervention to which these students were referred. This procedure was used to help students avoid experiencing undue influence to participate in the study due to the presence of their instructor. Further, it was important to collect data before the students began any intervention so the results were not influenced by the intervention thus increasing the internal validity of this study.

Students were provided information about participation in this study both verbally and in writing with a research information sheet (see Appendix A). Students were informed that their participation was voluntary and if they chose not to participate there would be no repercussions (i.e., their standing with their instructors, the university, and legal institutions would not be affected). Students were also informed that participation and questionnaires were anonymous and confidential. The research information sheet
emphasized the voluntary nature of completing the questionnaire, explained the purpose of this study, indicated the investigators’ contact information in case students had further questions about the study, and provided a list of local counseling resources in case students wanted to pursue further discussion regarding their alcohol use. Signatures were not required on an informed consent form per IRB approval due to the importance of maintaining anonymity (see Appendix J). In addition to the questionnaire packet, students were provided general information about alcohol consumption which they could read if they chose not to participate in the study. Students who chose to participate required approximately 30 minutes to complete the questionnaire packet.

The questionnaire packet consisted of a cover page (see Appendix B), the TPB questionnaire, the UPPS, the Aversiveness of Consequence Scale, the BIDR, the Beliefs Survey, and a demographics survey. The TPB questionnaire, the UPPS, Aversiveness of Consequence Scale, BIDR, and Beliefs Survey were counterbalanced in order to limit order effects. The demographics sheet was presented as the last document of the packet.
CHAPTER IV
RESULTS

This chapter summarizes the statistical analyses and results of the current study. The chapter begins with an explanation of the data screening process. Then, descriptive statistics and preliminary analyses of assumptions for statistical procedures are described. Finally, data analyses which examined the three main hypotheses are explained. The chapter ends with a description of exploratory analyses which were conducted assessing the relationships between the indirect measures and the direct measures of the theory of planned behavior.

Data Screening

Data were sought from 102 students who were mandated to an alcohol intervention for alcohol-related offenses at a large Midwestern University between the months of January through March 2010. Seventeen students declined participation. This resulted in an 83% response rate. Therefore, the initial sample consisted of 85 undergraduate students.

The data set was examined for accuracy of data entry, missing data, and outliers. Data were first checked visually and then preliminary descriptive analyses were completed using SPSS version 17 for Windows. Initially data were screened for out-of-range scores to identify data entry errors. This screening was conducted by completing
frequencies analysis on all of the demographic variables and instruments used in this study. All data fell within the expected ranges for demographics and for each instrument. Data from eight participants were excluded as follows: six participants did not complete significant portions of the survey and two participants appeared to respond indiscriminately (as indicated by visual inspection of the data) by endorsing the same numbers (i.e., all 1’s or all 7’s). These surveys were dropped from further data analyses to avoid data distortion (Tabachnick & Fidell, 2001). As a result, statistics were computed on a final sample of 77 participants. For the remainder of the data, 12 out of a total 12,166 data points were missing. Missing data points were examined and dealt with by substituting the variable’s mean value as calculated from the respondent’s other item response for the scale in accordance to recommendations by Tabachnick and Fidell. No participant omitted more than three responses.

Outliers were identified by using stem and leaf plots and boxplots, and extreme values were examined. No outliers were identified for the following variables: intention, perceived behavioral control, impulsivity, and social desirability. Stem and leaf plots and boxplots identified one outlier each for attitude, subjective norm, and aversiveness of consequence. Mahalonobis distance and Cooke’s distance statistics were computed and did not reveal that these outliers were influential. Specifically, the maximum Mahalonobis distance statistic of 14.82 does not exceed the critical value of 18.47 for 4 independent variables, and the maximum Cooke’s Distance statistic of .14 does not exceed the cutoff of 1 (Tabachnick & Fidell, 2001).
Preliminary Analyses

Descriptive statistics were computed for the main variables of interest to the current study. Table 2 presents means, standard deviations, skew, kurtosis, and Cronbach’s alpha for the primary measures. As can be seen, all variables demonstrated appropriate ranges for skew and kurtosis (i.e., below the absolute value of 2)(Heppner & Heppner, 2004); therefore, these variables did not violate the assumption of normality and were deemed appropriate for use with the statistical procedures planned for this study.

In Francis and colleagues’ (2004) detailed manual for the development of a questionnaire based upon the TPB, they suggested using an index of internal consistency to establish the measure’s reliability. Alpha coefficients, thus, were computed for the TPB scales for the direct measures (attitude, subjective norm, perceived behavioral control, and intentions), as well as the UPPS, the Aversiveness of Consequence scale, and the BIDR to ensure each demonstrated acceptable reliability. With the exception of the sensation-seeking dimension of impulsivity (α = .68) reliability estimates for all scales were at least .70. Internal consistency alphas were not computed for the indirect measures relating to the underlying beliefs of the TPB because, “people can quite logically hold both positive and negative beliefs about the same behavior, [therefore] it is not appropriate to assess the reliability of indirect measures using an internal consistency criterion” (p. 9). Relevant alpha coefficients are reported in Table 2 for the measures.
Table 2

Descriptive Statistics for Main Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
<th>Skew</th>
<th>Kurtosis</th>
<th>Cronbach’s Alpha</th>
<th>Possible Range</th>
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<td>1.82</td>
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<td>.97</td>
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*Note.* CON = Aversiveness of Consequence; UPPS = Total Impulsivity Score; UP-PM = Premeditation Subscale; UP-U = Urgency Subscale; UP-P = Perseverance Subscale; UP-SS = Sensation Seeking Subscale; BIDR = Balanced Inventory of Desirable Responding; IM = Impression Management BIDR Subscale; SDE = Self-Deceptive Enhancement BIDR Subscale.

Descriptive Statistics

Further descriptive statistics were completed on the demographic questionnaire for the 77 participants. The demographic composition of the sample was previously reported in Chapter 3. In terms of the date on which the alcohol related offenses occurred, the majority of offenses occurred in September 2009, October 2009, and November 2009 (23.4%, 18.2%, and 16.9% respectively). Six participants did not
indicate the date of their offense. Summary data for the sample regarding the month and year in which alcohol-related offenses occurred are presented in Figure 5.

Figure 5
Date in which Alcohol-Related Offense Occurred

Participants were also asked to estimate how often they consumed a beverage containing alcohol. The majority of students (42.9%) reported drinking alcohol two to four times per month; but almost as many students (36.4%) reported drinking two to three times per week. In this sample, 15.6% of participants reported drinking once a month or less, and 2.6% reported drinking four or more times per week. Finally, 2.6% of these students reported never drinking which can be explained by some students having been
cited for possession or transportation of alcohol (e.g., alcohol found in a student’s car or dorm room) rather than consumption.

Overall, a larger percentage of this sample of students reported drinking alcohol at least monthly in comparison to the general (non-mandated) college population as has been reported in earlier literature. For example, previous studies (O’Malley & Johnston, 2002; Hoban, 2006) have reported that 65 to 70% of students report drinking on a monthly basis. In contrast, 79.3% of this sample reported drinking alcohol at least one time per month. However, because this sample consisted of students who have been mandated to treatment due to an alcohol violation, the fact that they reported more frequent drinking may be expected. A bar chart demonstrating reported frequency of alcohol consumption is presented in Figure 6.

Participants were also asked to estimate the number of alcoholic beverages they consumed on a typical occasion when they drank alcohol. The majority of this sample of students (29.9%) reported consuming seven to eight alcoholic beverages per occasion. Three to four alcoholic beverages were consumed by 20.8% of this sample and five to six beverages were consumed by 19.5% of this sample. Finally, 16.9% of these students reported drinking one to two beverages per occasion and 13% of the sample reported consuming nine or more beverages per typical occasion. Figure 7 presents these data in a bar chart.
Figure 6

Drinking Frequency

Figure 7

Typical Number of Alcoholic Beverages Consumed per Occasion
Overall, these data suggest that 62.4% of this sample of undergraduates engage in high risk alcohol consumption (as defined by five or more alcoholic beverages) on a typical drinking occasion. These data imply that more students in this sample engaged in high risk alcohol consumption more frequently than in the general population of non-mandated college students, in which this behavior has been reported to be between 40 – 44% (Hingson, Zha, & Weitzman, 2009; O’Malley & Johnston, 2002). Taken together, the descriptive data support previous research which suggests that mandated students drink more frequently and heavily than the general undergraduate population (Barnett et al., 2004; Fromme & Corbin, 2004).

Assumptions of Multiple Regression

The data next were analyzed to ensure that there were no violations of assumptions for multiple regression. Residuals were examined to test the assumptions of normality, linearity, homoscedasticity, and independence. Normality was examined by creating a histogram with normal curve. Figure 8 presents the histogram which suggests the distribution is normal for the dependent variable, intention. A normal probability plot of the regression standardized residuals was also inspected for linearity; because the data points lie in a reasonably straight diagonal line it suggests there are no major departures from normality (see Figure 9). Additionally, an examination of the scatterplot for the standardized residuals demonstrates homoscedasticity and independence of residuals (see Figure 10) as indicated by the residuals being rectangular in distribution and roughly centered around 0.
Figure 8

Histogram with Normal Curve

Figure 9

Normal P-Plot of Regression Standardized Residual
Tabachnick and Fidell (2001) suggested that one way to check for multicollinearity among the independent or predictor variables is to examine correlations between variables. The relationships among the primary TPB variables – intention, attitude, perceived behavioral control, subjective norm – were examined along with the other three variables of interest to this study – aversiveness of consequence, impulsivity (and its four subscales: premeditation, urgency, perseverance, and sensation-seeking), and social desirability (self-deceptive enhancement and impression management). Table 3 presents the correlation matrix. Further, collinearity diagnostics were computed and did not reveal any problems with multicollinearity or singularity as indicated by Tolerance statistics which ranged from .64 to .93, and Variance Inflation Factors (VIF) which ranged from 1.08 to 1.56. According to Pallant (2007), Tolerance statistics should be greater than .10 and VIF statistics should be less than 10 in order to satisfy the assumptions for avoiding multicollinearity and singularity.
Table 3

Intercorrelations among Variables

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</tr>
<tr>
<td>11</td>
<td>BIDR</td>
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<td>-.32**</td>
<td>.28*</td>
<td>-.27*</td>
<td>.15</td>
<td>-.54**</td>
<td>-.42**</td>
<td>-.49**</td>
<td>-.41**</td>
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<tr>
<td>12</td>
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<td>-.18</td>
<td>.29**</td>
<td>-.16</td>
<td>.01</td>
<td>-.45**</td>
<td>-.34**</td>
<td>-.42**</td>
<td>-.43**</td>
<td>-.10</td>
<td>.83**</td>
<td></td>
<td></td>
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<tr>
<td>13</td>
<td>IM</td>
<td>-.34**</td>
<td>-.35**</td>
<td>.18</td>
<td>-.30*</td>
<td>.24*</td>
<td>-.45**</td>
<td>-.37**</td>
<td>-.39**</td>
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<td>.17</td>
<td>.05</td>
<td>-.28*</td>
<td>-.01</td>
<td>-.45**</td>
</tr>
</tbody>
</table>

Note: CON = Aversiveness of Consequence; UPPS = Total Impulsivity Score; UP.PM = Premeditation Subscale; UP.U = Urgency Subscale; UP.P = Perseverance Subscale; UP.SS = Sensation Seeking Subscale; BIDR = Balanced Inventory of Desirable Responding; SDE = Self-Deceptive Enhancement Subscale; IM = Impression Management Subscale; FRQ = Frequency of Alcohol Consumption; AMT = Typical Amount of Alcohol Consumed per Occasion.

*p < .05, ** *p < .01.
As can be seen in Table 3, many of the variables are significantly correlated. However, none of the relations among the independent variables are too strong (i.e., greater than .90) which would cause concern for multicollinearity and singularity (Pallant, 2007). Overall, the observed relationships were in the expected directions. Specifically, attitudes toward drinking to intoxication were strongly positively related to intentions to drink to intoxication \((r = .73, p < .01)\), and likewise attitudes toward drinking to intoxication were positively related to social pressure to drink to intoxication \((r = .57, p < .01)\). Further, impulsivity was positively related to attitudes toward drinking to intoxication \((r = .34, p < .01)\), and to intentions to drink to intoxication \((r = .32, p < .01)\).

Based on examination of the separate subscales of the impulsivity measure, only two of the four dimensions appeared to have important relationships with intentions to drink to intoxication and attitudes. Urgency was positively related to intentions \((r = .28, p < .05)\) and attitudes \((r = .30, p < .01)\). Perseverance was also positively related to intentions \((r = .30, p < .01)\) and attitudes \((r = .28, p < .05)\). Premeditation and sensation-seeking were not significantly related to intentions to drink to intoxication or to attitudes in this sample. Sensation-seeking demonstrated a statistically significant though small negative relationship to aversiveness of consequence \((r = - .27, p < .05)\), suggesting that those students who found the alcohol-related incident most disturbing tended to be lower on sensation-seeking. Aversiveness of consequence was also statistically significantly negatively related to perceived behavioral control \((r = - .25, p < .05)\), suggesting that students who felt more control over their drinking behaviors also reported feeling less upset by the alcohol-related consequence (i.e., receiving an alcohol-related citation).
Both frequency of alcohol consumption and amount of alcohol typically consumed were related to some variables in similarly significant ways. For example, frequency of alcohol consumption was positively related to intentions ($r = .52, p < .01$), attitude ($r = .32, p < .01$), and subjective norm ($r = .26, p < .05$). This suggested that the more frequently students consume alcohol, the more strongly they intend to drink to intoxication, the more positive attitude they have toward drinking to intoxication, and that they also feel more social pressure to do so. Frequency of alcohol consumption was also statistically significantly positively related to the impulsivity measure ($r = .26, p < .05$) and specifically to the urgency dimension of impulsivity ($r = .22, p < .05$). Similarly, amount of alcohol typically consumed was positively related to intentions ($r = .63, p < .01$), attitude ($r = .55, p < .01$), and subjective norm ($r = .36, p < .01$), but it was not significantly related to any of the impulsivity measures. Finally, frequency of alcohol consumption and amount of alcohol typically consumed were also statistically significantly positively correlated ($r = .52, p < .01$), suggesting that those students who drink most frequently also drink in greater amounts.

As can also be seen in Table 3, the social desirability measure was statistically significantly related to the TPB variables. Specifically, this correlation analysis suggested that students who responded in a socially desirable manner were likely to report less intention to drink to intoxication ($r = -.29, p < .01$), less positive attitudes toward drinking to intoxication ($r = -.32, p < .01$), more control over their drinking behaviors ($r = .28, p < .05$), and less perceived pressure to engage in drinking to intoxication ($r = -.27, p < .05$). The impression management subscale of the social desirability measure related most strongly to students’ reported intentions ($r = -.34, p < .01$).
.01), reported attitude ($r = -.35, p < .01$), and reported subjective norm ($r = -.30, p < .05$). However, the self-deceptive enhancement subscale of the social desirability measure was statistically significantly positively related to students’ reported perceived behavioral control ($r = .29, p < .01$), suggesting that students who were more likely to deceive themselves tended to report that they believed they had more control over their drinking behaviors.

Overall, the social desirability measure was also related statistically significantly and negatively to all of the impulsivity subscales except sensation seeking. This suggests that students who responded in a socially desirable fashion, tended to report fewer characteristics of impulsivity (Impulsivity, $r = -.54, p < .01$; Premeditation, $r = -.42, p < .01$; Urgency, $r = -.49, p < .01$; Perseverance, $r = -.41, p < .01$). Finally, the impression management subscale of the social desirability measure statistically significantly positively related to the aversiveness of consequence scale ($r = .24, p < .05$), suggesting that students who were most concerned with presenting themselves in a positive light also reported that the alcohol-related citation was more disturbing to them. Due to the measure for socially desirable responding being statistically significantly related to the majority of the important variables in this study, it was used as a covariate for the subsequent statistical analyses.

**Tests of Hypotheses**

Hierarchical multiple regression was used to test the three primary hypotheses of this study. Hierarchical multiple regression was used because the order of the independent variables entered into the regression was chosen a priori due to the TPB theory. In all regressions, intention to drink to intoxication was the criterion variable and
social desirability was a covariate. The first hypothesis was an overall test of the predictive validity of the theory of planned behavior for explaining intentions to drink to intoxication in this sample of mandated college students. Hypothesis one proposed that a statistically significant amount of variance in intention to drink to intoxication could be explained by attitude, perceived behavioral control, and subjective norm for college students who were mandated to alcohol intervention. Social desirability was entered at step one of the hierarchical regression as a covariate explaining 9% ($F(1, 75) = 7.29, p = .009$) of the variance in intention to drink to intoxication. After entering attitude, perceived behavioral control, and subjective norm at step two, the total variance explained by the whole model was 64%, ($F(4, 72) = 31.76, p < .001$). Therefore, the theory of planned behavior explained an additional 55% of the variance in intention to drink to intoxication after controlling for socially desirable responding, $\Delta R^2 = .55, \Delta F(3, 72) = 36.47, p < .001$. In the final model, however, only attitude and subjective norm were statistically significant, with attitude demonstrating a higher beta value ($\beta = .49, p < .001$) than subjective norm ($\beta = .41, p < .001$). Perceived behavioral control was not significant ($\beta = .09, p = .23$). Statistical results for the final regression are presented in Table 4.

Hierarchical regression also was used to test hypotheses two and three. Hypothesis two proposed that impulsivity would explain unique variance in intentions to drink to intoxication above and beyond the variance explained by the theory of planned behavior variables of attitude, perceived behavioral control, and subjective norm. Because social desirability was highly correlated to intention and the theory of planned
Table 4

Hypothesis 1 Hierarchical Regression Analysis Predicting Intention

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE B</th>
<th>β</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BIDR</td>
<td>-.11</td>
<td>.04</td>
<td>-.30</td>
<td>-2.70*</td>
</tr>
<tr>
<td>Step 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BIDR</td>
<td>-.02</td>
<td>.03</td>
<td>-.06</td>
<td>-.76</td>
</tr>
<tr>
<td>Attitude</td>
<td>.88</td>
<td>.16</td>
<td>.49</td>
<td>5.52**</td>
</tr>
<tr>
<td>Perceived Behavioral Control</td>
<td>.20</td>
<td>.17</td>
<td>.09</td>
<td>1.21</td>
</tr>
<tr>
<td>Subjective Norm</td>
<td>.59</td>
<td>.13</td>
<td>.41</td>
<td>4.60**</td>
</tr>
</tbody>
</table>

Note.  N = 77; BIDR = Balanced Inventory of Desirable Responding;  
*p < .01; **p < .001

behavior variables, it was entered in the first step of the hierarchical regression as a covariate, then the theory of planned behavior variables were entered in the second step, and finally the UPPS measure for impulsivity was entered in the third step. The final step of the model did not demonstrate significance; thus, hypothesis two was not supported. Impulsivity did not contribute unique variance over and beyond social desirability and the theory of planned behavior predictors, $\Delta R^2 = .00, \Delta F (1, 71) = .61, p = .44$. Another analysis was conducted to see if using the four subscales of the impulsivity measure at the third step would identify specific dimensions of impulsivity that contributed unique variance, however this was nonsignificant as well, $\Delta R^2 = .01, \Delta F$
(4, 68) = .33, p = .85. Statistical results for the final regression with the impulsivity measure are presented in Table 5.

Table 5
Hypothesis 2 Hierarchical Regression Controlling for Social Desirability and Adding Impulsivity to the Theory of Planned Behavior

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE B</th>
<th>Final β</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIDR</td>
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<td>-.02</td>
<td>-.26</td>
</tr>
<tr>
<td>Attitude</td>
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<td>.16</td>
<td>.47</td>
<td>5.23**</td>
</tr>
<tr>
<td>Perceived Behavioral Control</td>
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<td>.17</td>
<td>.08</td>
<td>1.05</td>
</tr>
<tr>
<td>Subjective Norm</td>
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<td>.13</td>
<td>.41</td>
<td>4.61**</td>
</tr>
<tr>
<td>UPPS</td>
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<td>.13</td>
<td>.07</td>
<td>.78</td>
</tr>
</tbody>
</table>

Note. N = 77. BIDR = Balanced Inventory of Desirable Responding; UPPS = Impulsivity total
**p < .001

Hypothesis three stated that aversiveness of consequence would explain unique variance in intention to drink to intoxication above and beyond the variance explained by the theory of planned behavior variables. Again social desirability was entered in the first step, the theory of planned behavior variables attitude, perceived behavioral control, and social norm were entered in the second step, and aversiveness of consequence was entered in the third step. This hypothesis was not supported. Aversiveness of consequence did not contribute unique variance over and beyond social desirability and the theory of planned behavior variables, $\Delta R^2 = .01, \Delta F (1, 71) = .29, p = .29$. Statistical results for all of the variables in the final regression model are presented in Table 6.
**Table 6**

Hypothesis 3 Hierarchical Regression Controlling for Social Desirability and Adding Aversiveness of Consequence to the Theory of Planned Behavior

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE B</th>
<th>Final β</th>
<th>T</th>
</tr>
</thead>
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<tr>
<td>BIDR</td>
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<td>.03</td>
<td>-.04</td>
<td>-.44</td>
</tr>
<tr>
<td>Attitude</td>
<td>.87</td>
<td>.16</td>
<td>.49</td>
<td>5.44**</td>
</tr>
<tr>
<td>Perceived Behavioral</td>
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<td>.07</td>
<td>.82</td>
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<td>Control Subjective</td>
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<td>.43</td>
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<tr>
<td>Norm</td>
<td>CON</td>
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<td>.11</td>
<td>-.08</td>
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</table>

*Note. N = 77. BIDR = Balanced Inventory of Desirable Responding; CON = Aversiveness of Consequence  **p < .001

**Exploratory Analyses**

Partial correlations between the indirect measures and direct measures of attitude, subjective norm, and perceived behavioral control were computed after controlling for social desirability to check the validity of the indirect measures of the theory of planned behavior (Francis et al., 2004). Additionally, the items which make up the indirect measures were correlated with both the indirect and the direct scale scores. The indirect measure for attitude represents the underlying behavioral beliefs related to the benefits and disadvantages of drinking to intoxication multiplied by the belief strength. Overall, the direct attitude measure and the indirect attitude measure correlated significantly statistically, *r = .46, p < .01*, suggesting the validity of the indirect measure of attitude.
The item to scale correlations suggested that five underlying behavioral beliefs from the indirect measure were most strongly correlated with the direct measure of attitude. Specifically, the more students reported believing that their grades would be affected by drinking to intoxication, the less positive attitude they had toward drinking to intoxication \( (r = -.32, p < .01) \). Also, students who found socializing \( (r = .41, p < .01) \), meeting new people \( (r = .49, p < .01) \), and having fun \( (r = .54, p < .01) \) as being important while they are in college rated their attitudes toward drinking to intoxication more positively. Further, students who reported positive attitudes toward drinking to intoxication stated they were more likely to spend money on alcohol \( (r = .27, p < .01) \). Tables 7 presents the correlation matrices for the indirect and direct measures of behavioral beliefs and attitude.

The indirect measure of perceived behavioral control assessed the underlying control beliefs which were reported to inhibit students’ drinking to intoxication. As indicated in Table 8, the direct measure of perceived behavioral control and the indirect measure of perceived behavioral control were weakly correlated \( (r = .16, p > .05) \). This suggests the indirect measure may not have been a valid measure; however, this finding could also mean that the direct measure was not valid. According to Francis et al. (2004), “low correlations would likely be the result of indirect measures that were poorly constructed or did not adequately cover the breadth of the measured construct” (p. 30). Table 8 demonstrates that none of the items for the indirect measure for perceived behavioral control were statistically significantly correlated to the direct measure.
Table 7

Attitude: Direct Scale Score Correlated with Indirect Scale Score and Specific Items

<table>
<thead>
<tr>
<th></th>
<th>ATT</th>
<th>IATT</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATT</td>
<td>.46**</td>
<td>-.32**</td>
</tr>
<tr>
<td>IATT</td>
<td>-.07</td>
<td>.53**</td>
</tr>
</tbody>
</table>

Note. ATT = Direct Measure of Attitude; IATT = Indirect Measure of Attitude; Indirect Items (GRD = Grades; STRS = Stress; H/O = Hangovers; SOC = Socializing; BDEC = Bad Decisions; MT = Meeting New People; MON = Money; FUN = Fun; HR = Health Risks; LEG = Legal problems). *p < .05; **p < .01.

Table 8

Perceived Behavioral Control: Direct Scale Score Correlated with Indirect Scale Score and Specific Items

<table>
<thead>
<tr>
<th></th>
<th>I-PBC</th>
<th>FRDIS</th>
<th>DCLASS</th>
<th>EXAM</th>
<th>ACCESS</th>
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</thead>
<tbody>
<tr>
<td>PBC</td>
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<td>.14</td>
<td>.13</td>
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<tr>
<td>IPBC</td>
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<td>.75**</td>
<td>.61**</td>
<td>.38**</td>
<td></td>
</tr>
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</table>

Note. PBC = Direct Measure of Perceived Behavioral Control; I-PBC = Indirect Measure of Perceived Behavioral Control; Indirect Items (FRDIS = Friend’s Discouragement; DCLASS = Difficult Classes; EXAM = Exams; ACCESS = Access to Alcohol). **p < .01.

The indirect measure of subjective norm assessed the underlying normative beliefs regarding the referents whose opinions were most valued when determining students’ intentions to drink to intoxication. Table 9 presents data from the intercorrelations between the direct and indirect measures for subjective norm. The correlation was statistically significant ($r = .56, p < .01$), suggesting that the indirect measure of subjective norm was likely a valid measure of perceived social pressure to drink to intoxication. In examining the underlying normative beliefs, it appears that students’ friends ($r = .55, p < .01$), other college students ($r = .37, p < .01$), and parents ($r$


= .34, \( p < .01 \) are the most important referents to these participants when determining their intentions to drink to intoxication while they are in college.

Table 9

Subjective Norm: Direct Scale Score Correlated with Indirect Scale Score and Specific Items

<table>
<thead>
<tr>
<th></th>
<th>I-SN</th>
<th>PAR</th>
<th>REL</th>
<th>FRND</th>
<th>COLL</th>
<th>PROF</th>
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</thead>
<tbody>
<tr>
<td>SN</td>
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<td>.34**</td>
<td>.16</td>
<td>.55**</td>
<td>.37**</td>
<td>.15</td>
</tr>
<tr>
<td>I-SN</td>
<td>.64**</td>
<td>.56**</td>
<td>.73**</td>
<td>.67**</td>
<td>.36**</td>
<td></td>
</tr>
</tbody>
</table>

Note. SN = Direct Measure of Subjective Norm; I-SN = Indirect Measure of Social Norm; Indirect Items (PAR = Parents’ Opinions; REL = Religious Leaders’ Opinions; FRND = Friends’ Opinions; COLL = College Students’ Opinions; PROF = Professors’ Opinions). ** \( p < .01 \).

Hierarchical multiple regression was used to see if adding the indirect measures of the TPB would improve the explanatory power of the direct measures in predicting intention to drink to intoxication after controlling for social desirability. Social desirability was entered at step one of the regression, explaining 9% of the variance in intention to drink to intoxication. The direct measures of the TPB were entered at step two, explaining an additional 55% of the variance in intention. The addition of the three indirect measures of the TPB added 4% to the variance explained by the model, \( \Delta R^2 = .04, \Delta F (3, 69) = 2.84, p = .04 \). After entering the indirect measures of the TPB at step 3, the total variance explained by the whole model (social desirability, direct measures of the TPB, and indirect measures of the TPB) was 68%, \( F (3, 69) = 20.76, p < .001 \). In the final model, the direct measures of attitude and subjective norm, as well as the indirect measure of attitude (behavioral beliefs) were statistically significant with direct attitude demonstrating \( \beta = .40, p < .001 \), subjective norm \( \beta = .37, p < .001 \) and indirect attitude \( \beta \)
=.24, \( p < .005 \). Table 10 presents the relevant statistics for all of the variables in this final hierarchical multiple regression model.

Table 10

Hierarchical Regression for Direct and Indirect Measures Explaining Unique Variance in Intention to Drink to Intoxication after Controlling for Social Desirability

<table>
<thead>
<tr>
<th>Variable</th>
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<th>( \beta )</th>
<th>( T )</th>
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</thead>
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<tr>
<td><strong>Step 2 – Direct Measures</strong></td>
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</tr>
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<td>BIDR</td>
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<td>.03</td>
<td>-.06</td>
<td>-.76</td>
</tr>
<tr>
<td>ATT</td>
<td>.88</td>
<td>.16</td>
<td>.49</td>
<td>5.52**</td>
</tr>
<tr>
<td>PBC</td>
<td>.20</td>
<td>.17</td>
<td>.09</td>
<td>1.21</td>
</tr>
<tr>
<td>SN</td>
<td>.59</td>
<td>.13</td>
<td>.41</td>
<td>4.60**</td>
</tr>
<tr>
<td><strong>Step 3 – Indirect Measures</strong></td>
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<td></td>
</tr>
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<td>-.04</td>
<td>-.52</td>
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<tr>
<td>ATT</td>
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<td>.40</td>
<td>4.34**</td>
</tr>
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<td>PBC</td>
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<td>I-SN</td>
<td>.00</td>
<td>.01</td>
<td>-.01</td>
<td>-.10</td>
</tr>
</tbody>
</table>

Note. ATT = Direct Measure of Attitude; PBC = Direct Measure of Perceived Behavioral Control; SN = Direct Measure of Subjective Norm; I-ATT = Indirect Measure of Attitude; I-PBC = Indirect Measure of Perceived Behavioral Control; I-SN = Indirect Measure of Subjective Norm. *\( p < .01 \), **\( p < .001 \)
Further exploratory analyses were conducted to test the explanatory power of the TPB for only those participants who were the most frequent and heaviest drinkers in this sample of mandated college students. Using the definition provided in the literature for frequent drinking (Walters & Baer, 2006), regression analyses were computed on those participants who reported drinking alcohol at least two to three times per week. In this sample, 30 participants fit the definition of being frequent drinkers.

Social desirability did not account for a statistically significant amount of the variability in intention to drink to intoxication in this group ($R^2 = .00, F(1, 28) = .00, p = .95$). Therefore, regression analyses were computed with the direct measures of attitude, subjective norm, and perceived behavioral control explaining variance in the criterion variable intention. Regression analyses demonstrated that the TPB model statistically significantly explained intention to drink to intoxication ($R^2 = .72, F(3, 26) = 21.95, p < .001$). Therefore, 72% of the variance in intention to drink to intoxication could be explained by the TPB model for participants who were frequent drinkers. All of the TPB variables were statistically significant suggesting that they all contributed unique explanatory power to the model, with subjective norm demonstrating the highest beta value ($\beta = .51, p < .001$), attitude demonstrating the next highest beta value ($\beta = .45, p = .002$), and perceived behavioral control demonstrating the lowest beta value ($\beta = .26, p = .023$).

Also using the definition from the literature for heavy drinking (≥ 5 drinks per occasion; Johnston & White, 2003), regression analyses were conducted to test the explanatory power for the TPB for heavy drinkers. In the current sample, 48 students reported consuming at least five alcoholic beverages per typical drinking occasion.
Again, social desirability was not a statistically significant predictor of intention \( (R^2 = .01, F(1, 46) = .28, p = .60) \). Therefore, a regression analysis was conducted to test the TPB model with the direct measures of attitude, subjective norm, and perceived behavioral control statistically predicting intention to drink to intoxication.

The TPB model was statistically significant with \( R^2 = .62 \) \( (F(3, 44) = 24.26, p < .001) \). Therefore, 62% of the variance in intention to drink to intoxication could be explained by the TPB model for participants who were heavy drinkers. All of the TPB variables were statistically significant suggesting they were all significant contributors to the model, with subjective norm demonstrating the highest beta value \( (\beta = .55, p < .001) \), attitude demonstrating the next highest beta value \( (\beta = .41, p < .001) \), and perceived behavioral control demonstrating the lowest beta value \( (\beta = .27, p = .008) \). Impulsivity and aversiveness of consequence remained nonsignificant in explaining the variance in intentions to drink to intoxication in these subsamples of mandated students.

**Summary of the Results**

Hypothesis one was a test of the predictive power of the theory of planned behavior in explaining intentions to drink to intoxication in a sample of college students who were mandated to alcohol intervention. Hierarchical multiple regression was used to assess this hypothesis. Hypothesis one was supported partially; results suggested that after controlling for social desirability, attitude and subjective norm statistically predict intentions to drink to intoxication by college students who have been mandated to alcohol intervention. Using exploratory analysis, when the current sample was specified to students who drink frequently \( (n = 30) \) and to students who drink heavily \( (n = 48) \), the
explanatory power of the theory of planned behavior was supported with all three of the variables (attitude, subjective norm, and perceived behavioral control).

Hypothesis two proposed an elaboration of the theory of planned behavior which suggested the addition of the personality variable, impulsivity, as a statistically significant contributor to the model. Hierarchical multiple linear regression was used to test if impulsivity could explain unique variance in intention to drink to intoxication above and beyond the theory of planned behavior. This hypothesis was not supported; impulsivity did not contribute significantly to the model.

Hypothesis three also proposed an elaboration of the theory of planned behavior which examined if aversiveness of consequence could significantly contribute to the explanation of intentions to drink to intoxication in a sample of college students who have been mandated to alcohol intervention. Hierarchical multiple linear regression was used to test if aversiveness of consequence could explain unique variance in intention to drink to intoxication above and beyond the theory of planned behavior. This hypothesis was not supported; aversiveness of consequence did not contribute significantly to the model.

In the exploratory analyses, the following results emerged. First, the validity of the indirect measures was partially supported with both attitude and subjective norm correlating with their respective indirect measures of behavioral beliefs and normative beliefs. Control beliefs were not significantly related to the direct measure perceived behavioral control which suggested that the interpretation of the measure was not valid in this sample. One of the indirect measures, behavioral beliefs, added unique variance beyond the TPB in the statistical prediction of intentions to drink to intoxication. After
conducting regression analyses on two subsets of the current sample (heavy and frequent drinkers), the TPB was fully supported with all direct measures (attitude, subjective norm, and perceived behavioral control) explaining a statistically significant amount of variance in mandated college students’ intentions to drink to intoxication.
CHAPTER V
DISCUSSION

The current study examined college students who were mandated for alcohol intervention and their reported intentions to drink to intoxication. The aim of this research was to increase knowledge about this infrequently studied population which could aid in the development of future alcohol intervention and prevention efforts. The theory of planned behavior (TPB; Ajzen, 1991) was tested as a framework to uncover the motivational factors associated to these students’ alcohol-related intentions.

In this chapter, a brief explanation of the purpose and methods of this research is reviewed first. The findings and implications of the current study are then interpreted in the context of existing research which has used the TPB to explain alcohol-related intentions and alcohol behaviors in the general, non-mandated, college population. The chapter concludes with a presentation of this study’s limitations and suggestions are provided for future research. Practice implications are also suggested in terms of developing and evaluating interventions aimed at reducing high-risk alcohol consumption in mandated samples of college students.

Overview of Project

The extent of alcohol abuse on college campuses has been a well-documented problem for the last three decades (Wechsler & Nelson, 2008). A great deal of research
has been conducted to improve our understanding of college students’ motivation for alcohol abuse and the related negative consequences (Neal & Fromme, 2007). However, limited research has been conducted examining particular populations which may be at higher risk for future alcohol-related problems, such as college students who have been mandated to alcohol intervention/treatment due to recent alcohol infractions (Martens, Neighbors, & Lee, 2008). Therefore, the current study sought to address this void in the literature by utilizing a sample of college students who had been referred (and mandated) for alcohol intervention due to alcohol-related violations.

Another limitation of the existing literature which the current study attempted to address is the relative lack of theory-driven research used to understand mandated college students’ alcohol abuse. Such research could be used to plan more effective prevention programs (Broughton & Molasso, 2006). Romano and Netland (2008) introduced counseling psychologists to the theory of planned behavior (TPB; Ajzen, 1991) as a model for behavior change that could inform and facilitate the prevention work traditionally valued by counseling psychologists. Therefore, the current study is in part a response to Romano and Netland’s recommendation to counseling psychologists to use the TPB as a framework in conducting prevention-related research.

Some recent research has shown the TPB to be a promising theory for studying alcohol use in general samples of college students (e.g., Collins & Carey, 2007; Glassman, Braun, Dodd, Miller & Miller, 2010; Johnston & White, 2003; Norman, Armitage, & Quigley, 2007; Norman, Bennett, & Lewis, 1998; Wall, Hinson, & McKee, 1998). These previous studies have shown the TPB to account for between 40% and 70% of the variance in alcohol-related intentions and between 22% and 74% of the variance in
alcohol-related behavior. Most of these studies supported attitude as a statistically significant predictor of both intention and behavior, but the explanatory power of subjective norm and perceived behavioral control varied between studies depending upon the measures used to test these constructs and the operational definitions of the dependent variables. Prior to the current study, however, the TPB had not been used to explore the alcohol-related motivational factors of college students who are mandated to alcohol intervention. Nor had researchers attempted to account for students’ possible response sets by examining the role of social desirability in explaining variance in alcohol-related intentions in the model.

The current study also explored extending the TPB by including two additional variables: impulsivity and aversiveness of consequence. Impulsivity has been the most consistent personality trait associated with alcohol abuse (Sher & Trull, 1994; Windle, 1990) and therefore the current study hypothesized that impulsivity would enhance the TPB by explaining additional and unique variance in these mandated college students’ reported intentions to drink to intoxication. Further, researchers have recently explored college students’ reactions to negative personal experiences with alcohol (e.g., alcohol overdoses); their results indicated that these students reported major regrets, seemed to accept responsibility for their behaviors that led to overdoses, and reported plans to alter the amount and pace of their future drinking (Reis, Harned, & Riley, 2004).

Additionally, college students who have been mandated to alcohol intervention were studied and findings suggested that their opinions regarding the aversiveness of the alcohol-related event which led to their alcohol referral varied (Mallet et al., 2008). Because the current sample of college students had been cited for alcohol-related
offenses, their reactions to the alcohol citations were examined in relation to their reported intentions to drink to intoxication. This variable was termed aversiveness of consequence and it was also expected to add explanatory power to the TPB in accounting for variance in these participants’ reported intentions.

Thus, the current study addressed some limitations of the existing TPB and college alcohol abuse literature, and it proposed an extension of the TPB model. First, this study engaged in formative research and used the TPB model to identify alcohol-related motivational factors and underlying alcohol-related beliefs for college students who are mandated to alcohol intervention. Second, this study examined the role of these factors and beliefs and that of social desirability in explaining reported alcohol-related intentions within the TPB model. Third, impulsivity and aversiveness of consequence were assessed in terms of their ability to explain additional variance in mandated college students’ reported alcohol-related intentions above and beyond the TPB.

To accomplish these aims, 77 undergraduate students (71% male; 87% Caucasian) from a large Midwestern university who had been referred for mandated alcohol intervention consented to take part in this study. Participation entailed anonymously completing a series of paper and pencil questionnaires assessing reports of alcohol-related intentions, attitudes, perceived social pressure, perceived control over drinking, associated beliefs regarding alcohol consumption, impulsivity, aversiveness of alcohol-related infractions, and social desirability. A series of regression analyses were used to account for variance in intentions to drink to intoxication among the respondents to determine which TPB variables might be relevant when developing and evaluating...
interventions to decrease high-risk alcohol consumption in a mandated college population.

**Main Findings and Implications of the Current Study**

The findings of this study extend previous research which assessed the motivational determinants of alcohol-related intentions in college students (Collins & Carey, 2007; Cooke, Glassman et al., 2010; Huchting, Lac, & LaBrie, 2007; Johnston & White, 2003; Norman, Armitage, & Quigley, 2007; Norman, Bennett, & Lewis, 1998; Norman & Conner, 2006). Foremost, this is the first study to assess the predictive power of the TPB in explaining intentions to drink to intoxication in a sample of college students mandated for alcohol intervention. The results of this study show mixed support for the TPB’s efficacy in explaining intentions to drink to intoxication in this sample.

Initial analyses suggested that the explanatory power of the TPB was only partially supported because intentions to drink to intoxication were best accounted for by one’s attitude and perceived pressure (subjective norm) to drink to intoxication, but not by one’s perceived control (perceived behavioral control) over drinking to intoxication. However, when the sample was limited specifically to frequent (defined by reporting drinking at least two to three times per week) and heavy drinkers (defined by reporting consuming at least five alcoholic beverages per occasion), the TPB’s explanatory power was fully supported with all three variables (attitude, subjective norm, and perceived behavioral control) statistically predicting intentions to drink to intoxication. Therefore, for heavy and frequent drinkers, their attitudes regarding drinking to intoxication, their experience of social pressure to engage in this behavior, and the level of control they felt
over their alcohol consumption, all accounted for variance in their reported intentions to drink to intoxication while they are in college.

This finding may suggest that the theory of reasoned action (TRA; Fishbein & Ajzen, 1975) is a better framework for the statistical prediction of alcohol-related intentions than is the TPB in a general sample of mandated students because the TRA model states that intention is predicted by attitude and subjective norm. The TPB (Ajzen, 1991) was developed as an elaborated model of TRA, and proposed the addition of the perceived behavioral control variable to account for behaviors over which people do not have complete volitional control. The differential performance of perceived behavioral control for the heaviest and most frequent drinkers in the current study may be a function of the severity of their alcohol abuse which may be indicative of their perceived diminished control over their alcohol consumption.

Consistent with this speculation is the fact that, generally, this sample of respondents reported the perception that they had significant control over their alcohol consumption. Specifically the mean for perceived behavioral control in this sample was 6.40 ($SD = .82$) on a 7-point scale. According to Ajzen (1991), the more perceived volitional control over a behavior, the less important perceived behavioral control should be in predicting it. In contrast, those respondents in this study who reported the heaviest and most frequent drinking behaviors may not have felt they had as much control over their drinking behaviors and thus perceived behavioral control emerged as an important predictor of intention for this subsample. For example, the mean for perceived behavioral control for heavy drinkers was slightly less at 6.30 ($SD = .83$) compared to 6.53 ($SD = .81$) for non-heavy drinkers in this sample. Further, the mean for perceived
behavioral control among frequent drinkers was somewhat lower at 6.16 ($SD = .93$) compared to 6.60 ($SD = .71$) for non-frequent drinkers in this sample.

This interpretation is also consistent with O’Callaghan and colleagues (1997), Huchting and colleagues (2008), and Glassman and colleagues (2010) who found the perceived behavioral control construct was not statistically predictive of intentions for alcohol consumption in a college student population. They hypothesized that the perceived behavioral control construct may not have explained a significant amount of the variance in alcohol use because the majority of their participants were not high-risk drinkers, and therefore they may have perceived a high level of control over their drinking behaviors.

In terms of support for the validity of the TPB in predicting alcohol-related intentions in the college population, then, the current study replicated previous research which suggested that attitude and subjective norm, but not perceived behavioral control, were statistically predictive of college alcohol-related intentions (Glassman et al., 2010; Huchting et al., 2008; Johnston & White, 2004; O’Callaghan et al., 1997). Overall, the perceived behavioral control construct has been inconsistently supported in the college alcohol abuse literature. For example, O’Callaghan and colleagues (1997), Johnston and White (2004), Huchting and colleagues (2008), and Glassman and colleagues (2010) all found that the perceived behavioral control construct did not emerge as a determinant of alcohol-related intentions. For some other studies which assessed alcohol-related behaviors in the college alcohol abuse literature, the authors substituted a measure of self-efficacy for the perceived behavioral control measure and found this variable to be statistically significant (e.g., Collins & Carey, 2007; Johnston & White, 2003).
The discrepancies between these studies suggest that the perceived behavioral control construct needs further study in both the mandated and voluntary populations of college students. Perhaps its use needs to be refined based on the population of interest. For example, Fishbein and Ajzen (2010) recently stated that perceived self-efficacy (Bandura, 1977) is a very similar concept to perceived behavioral control. Given the present findings and those of the extant literature on alcohol abuse in the general college population and the TPB, it may be that self-efficacy is a better (or more easily measured) construct for explaining alcohol-related intentions for less heavy or frequent student drinkers. Further, more deliberate application and measurement of the perceived behavioral control construct across studies (rather than making substitutions with self-efficacy measures) could facilitate more meaningful understanding of this construct.

Although the perceived behavioral control construct performed inconsistently in the current study, the proportion of variance in intention accounted for by the TPB was still strong. For the entire sample of mandated college students, 55% of the variance in intention to drink to intoxication was explained by the TPB model on top of 9% which was accounted for by social desirability. Further, for frequent drinkers in this sample, 72% of the variance in intention was explained by the TPB and for heavy drinkers 62% of the variance in intention was explained by the TPB. These findings are consistent with previous research. For example, Johnston and White (2003) found that 69% of the variance in intentions to binge drink was explained by the TPB. Also, Collins and Carey (2007) found that 47% of the variance in intention to engage in heavy episodic drinking was accounted for by the TPB, however, their study only found that attitude and self-efficacy (substituted for perceived behavioral control) emerged as statistically significant.
predictors. Further, research conducted with sorority members by Huchting and colleagues (2008) found that 44.7% of the variance in intentions to drink alcohol was accounted for by the TPB. In summary, the current research accounted for comparable variance in students’ intentions to drink to intoxication as did prior work.

Similar as well to prior research, attitudes and perceived social pressure emerged as the best predictors in explaining intentions to drink to intoxication. Regression analyses conducted on the entire sample of mandated respondents demonstrated that attitude was the most important predictor of intention to drink to intoxication. This finding is consistent with previous research which identified attitude to be one of the strongest predictors of alcohol-related intentions and behaviors in the TPB among college student drinkers (Collins & Carey, 2007; Glassman et al., 2010; Huchting et al., 2008; Johnston & White, 2003; Murgraff, McDermott, & Walsh, 2001; Wall, Hinson, & McKee, 1998). It appears that for both mandated and voluntary college student participants, a more positive attitude toward alcohol-related behaviors is related to stronger intentions to engage in the behavior. This suggests that college students’ decisions about high-risk drinking are likely influenced by how many benefits and costs they associate to getting drunk and the importance they ascribe to these consequences.

In the current study, subjective norm was almost as important as attitude in explaining variance in intention to drink to intoxication in a mandated college student sample. This finding suggests that as these mandated participants felt more perceived pressure to engage in drinking to intoxication, their intentions to drink to intoxication also increased. Some previous research left the subjective norm variable in question with regard to its contribution to the TPB in explaining alcohol-related intentions and
behavior. For example, Wall, Hinson, and McKee (1998) demonstrated that subjective norm was not a useful predictor of intentions to “drink too much” for their female participants, but it was a predictor of intentions for their male participants. Taking together these findings and the findings of the current study (wherein the majority of respondents were men), one implication may be that men are more susceptible to pressure they perceive from important others when it comes to their intentions and decisions regarding alcohol use. An alternative explanation could be that men are indeed more pressured (or expected) by society to engage in high-risk alcohol consumption while they are in college. Unfortunately due to the small number of women in the current sample, differences between men and women could not be tested statistically; this would be an area for future research.

An additional finding of the current study which may inform future research using the TPB to explain mandated college students’ alcohol-related intentions is the important role of social desirability. The current study identified that social desirability may impact students’ report of alcohol-related intentions in a mandated sample. Previously, none of the research in the TPB literature examined social desirability as an additional predictor or covariate of alcohol-related intentions. In the current study, social desirability was related to all of the primary TPB variables, thus it was used as a covariate in the regression analyses. This finding suggests that participants may have been motivated to present their responses to the surveys in a favorable manner. Even after controlling for social desirability, however, the power of the TPB to explain variance in intentions to drink to intoxication was supported. Interestingly, exploratory analyses suggested that social desirability lost its statistical significance when the sample was limited to students
reporting frequent and heavy drinking. Perhaps students who engage in the most
drinking may not feel the need to engage in impression management. At the same time,
the students who acknowledged more frequent drinking and less impression management
also endorsed more characteristics of impulsivity. Therefore, it may be that frequent
drinkers are more impulsive and thus lack the premeditation to engage in impression
management. Future research should identify more clearly the role that social desirability
plays in predicting alcohol-related intentions and behaviors in a non-mandated sample of
college students.

The current study’s attempt to elaborate the TPB model with impulsivity and
aversiveness of consequence was unsuccessful. The addition of these variables did not
enhance the TPB by explaining further variance in intentions to drink to intoxication.
Although the impulsivity measure was positively related to intention and attitude, it did
not add to the statistical prediction of participants’ intentions to drink to intoxication
above the explanatory power of the TPB. Participants who reported more impulsivity
also reported greater intentions to drink to intoxication and more positive attitudes toward
this behavior. However, after accounting for the TPB variables, impulsivity did not
explain additional and unique variance in intentions. This finding supports Ajzen’s
(1991) original contention that personality variables tend to be distal influences which are
completely mediated by the more proximal variables in the TPB model, such as attitude.
It may be, though, that impulsivity does not predict intention, but may moderate the
relationship between intention and behavior. This speculation is supported by the
statistically significant positive relation found in this study between impulsivity and
reported frequency of alcohol consumption. As the current study did not assess behavior, this hypothesis needs future research.

Counter to expectations, the aversiveness of consequence measure also did not add to the explanatory power of the TPB model, and it did not relate to any of the TPB constructs except perceived behavioral control. Results suggested that respondents who felt more control over their alcohol consumption experienced the legal consequence as less aversive. This finding may mean that students who deliberately engaged in alcohol consumption were willing to accept the legal risks associated with their behaviors. The implication of this finding for university administrators and practitioners is in the recognition that many college students will continue to drink despite the possible consequences. Harm reduction strategies, thus, may be the most effective interventions for decreasing the likelihood of dangerous behaviors occurring when students choose to drink. Rather than aiming interventions at decreasing alcohol consumption, it may be more feasible to aim interventions at minimizing alcohol-related harms. Due to the amount of time which elapsed between the alcohol-related incident which led to infraction and referral (between 3 to 7 months for the majority of the participants), however, the influence of aversiveness of consequence may have been diminished. Specifically, future research should assess whether time moderates the relationship between aversiveness and intention to drink to intoxication.

An alternate interpretation of the lack of variance explained by the aversiveness of consequence variable is that the measure was not valid or reliable. Two previous studies found this measure to correlate positively to number of drinks consumed prior to an alcohol-related incident, level of responsibility students assumed for the incident, and
motivation to change drinking behaviors; however, the researchers did not provide validity information for the aversiveness measure (Barnett et al., 2006; Barnett et al., 2008). Further, although these previous studies demonstrated strong internal consistency for the measure ($\alpha = .89$; Barnett et al.), the current study found a relatively low alpha ($\alpha = .70$) which suggests that it may not have performed in a reliable manner. Therefore, the aversiveness of consequence scale may not have tapped the construct for which it was intended.

**Exploratory Findings**

The exploratory analyses of the beliefs underlying TPB variables completed for this study also fill a gap in the research on the TPB and alcohol-related intentions in the college population. Fishbein and Ajzen (2010) stated, “By identifying and measuring the beliefs that are salient in the population we gain insight into the important considerations that guide people’s decisions and actions” (p. 321). According to the TPB model, behavioral beliefs, normative beliefs and control beliefs precede attitude, subjective norm, and perceived behavioral control. The current study extended previous research by developing these indirect measures through formative research (Ajzen, 1991). Overall, the validity of the indirect measures was partially supported. The indirect measure of behavioral beliefs was statistically significantly correlated with attitude and the indirect measure of normative beliefs was statistically significantly correlated with subjective norm. However, statistical analyses did not support the validity of the control beliefs measure as indicated by a relatively weak correlation with perceived behavioral control.

Consistent with the TPB, the direct measure of attitude was statistically significantly positively related to the indirect measure of behavioral beliefs. According
to Fishbein and Ajzen (2010), this finding supports the validity of the behavioral beliefs measure. Further, five behavioral beliefs were identified as being statistically significantly related to attitude. Participants’ attitudes toward drinking to intoxication were most strongly related to their beliefs about the likelihood that getting drunk would lead to poor grades, increase their opportunities to socialize, meet new people, have fun, and spend money. More benefits of drinking to intoxication than costs were identified by the respondents. This may indicate that respondents are generally very committed to their drinking behaviors. Therefore, one implication of this finding is that it seems these students have more reasons to get drunk than reasons to avoid getting drunk; therefore, changing these attitudes and thus changing alcohol-related behavior could prove quite challenging for practitioners. Mandated students may need more education about the negative consequences of drinking to intoxication and their positive expectations for intoxication should also be challenged. Another possibility is that these students need to be more stringently held accountable with significant negative consequences for irresponsible drinking behaviors which are implemented either legally or by their universities.

Another finding of the current study was that behavioral beliefs (indirect measure of attitude) emerged as a statistically significant predictor of intentions when the indirect measures were added to attitude, subjective norm, and perceived behavioral control in the regression. This finding may actually run counter to the TPB because according to the theory, by definition the measure of behavioral beliefs is an indirect measure of attitude and as such it should be mediated by the direct measure of attitude in the prediction of intentions. Fishbein and Ajzen (2010), however, recently suggested that this finding may
not contradict the model if the additional variance is limited; in the present case, behavioral beliefs only added a small increment (4%) to the explanatory power of the model. This very small increment thus may indicate that indeed behavioral beliefs are primarily mediated by attitude as the theory suggests.

Yet another explanation for this finding could be that the behavioral beliefs scale in this study measured some variable other than the beliefs underlying attitude, such as affect. For example, one of the behavioral beliefs items assessed participants’ belief that drinking to intoxication would lead them to “have fun.” This item may reflect a feeling of arousal or excitement (affective states) rather than being simply evaluative in nature. Fishbein and Ajzen (2010) explicitly differentiated between attitude and affect in explaining behaviors. Their definition of attitude refers to the evaluation of an object, concept, or behavior along evaluative dimensions such as good—bad, favorable—unfavorable, or like—dislike. In contrast, they defined the term affect as a separate experience characterized by a degree of somatic arousal. Although Fishbein and Ajzen proposed that affect may influence attitudes, they deemed these two constructs distinct. Regardless of which explanation for the significance of behavioral beliefs is correct, it is clear that both attitude and behavioral beliefs play an important role in explaining intentions to drink to intoxication among mandated college students. Further research could explore whether there are other affective states in this population which contribute to the model above and beyond direct TPB variables.

The direct measure of subjective norm also was statistically significantly positively related to its corresponding indirect measure of normative beliefs. This suggested that the indirect measure was valid. Of possible referents who these
participants considered to be important when making decisions about drinking to intoxication, the most important were friends, other college students, and parents. This finding supports previous research which identified the influence that peers have on the alcohol-related behaviors of college students (Lewis & Neighbors, 2004; Lewis, 2007). Specifically, the perception of greater approval for drinking from peers tends to be positively related to college students’ alcohol consumption (D’Amico et al., 2001). The fact that parents were reported to have influence over these participants’ drinking behaviors is also consistent with previous research (Abar & Turrisi, 2008; Brook, Whiteman, Finch & Cohen, 2000; Turrisi, Wiersma, & Hughes, 2000). The current study showed a positive association between parents’ approval of drinking and participants’ intentions to drink to intoxication. This finding may be explained by characteristics of this specific sample and the drinking culture/tradition which is evident at this large Midwestern university where prominent sports events are often accompanied by a great deal of alcohol consumption (e.g., students tailgating with their parents is not uncommon).

Inconsistent with the TPB, however, the indirect measure of control beliefs was only weakly positively correlated to the direct measure of perceived behavioral control. This suggests either that the perceived behavioral control measure, or the control beliefs measure, or both, were not valid measures. As stated previously, there has been a great deal of inconsistency in the TPB literature with regard to the definition of perceived behavioral control and also with regard to how it is measured. Further, with regard to control beliefs, Fishbein and Ajzen (2010) stated,
Given how often our theory has been tested, it is surprising how few studies have elicited and assessed control beliefs and perceived power. Moreover...most attempts to investigate the strength of the relationship between direct measures of perceived control and a belief-based index of its determinants have either failed to measure perceived power or have measured it incorrectly. (p. 403)

In the current study, this problem in the extant research may have been replicated because the measure for control beliefs appears, in retrospect, to have been inadequately constructed. Specifically, only items which reflected scenarios which would make drinking to intoxication difficult were assessed with the control beliefs scale. A stronger measure would have included items which reflected conditions which facilitate students’ drinking to intoxication (e.g., access to frequent parties, access to friends who are of legal drinking age, free time, etc.). Thus, the present findings with regard to control beliefs may be limited and unrepresentative of the actual domain of students’ beliefs underlying their perceived control of drinking behavior.

**Limitations and Future Directions for Research**

This study included several limitations which could be addressed in future research. First, this study was based entirely upon self-report data and as demonstrated by the correlation analyses, social desirability was related to all of the primary TPB variables. Despite the anonymity and confidentiality of the questionnaire, students seemed likely to minimize their reports of intentions to drink to intoxication. In this sample, impression management in particular was related to reporting less positive attitudes and intentions toward drinking to intoxication. Further, impression management also appeared related to some students’ reports of drinking less frequently and overall reports of drinking fewer alcoholic beverages per occasion. It is not surprising that the reports of students who are being disciplined for their alcohol-related behaviors would be
affected by response bias in this way. Although the current study demonstrated the explanatory power of the TPB even after controlling for social desirability, future research which explores alcohol-related motivational factors in a mandated population should also include a measure of social desirability.

There are also limits to the comparisons which can be made between the current study and previous TPB research due to differences between the current sample of mandated students and voluntary samples which have been used in previous studies. For example, despite the impact of social desirability mentioned above, the reported frequency and amount of typical alcohol consumption in the current sample of mandated students was somewhat higher and more frequent than statistics which have been reported for the general college student population (O’Malley & Johnston, 2002). This finding supports previous authors’ contentions that mandated college students are a higher risk population due to their more frequent and heavier drinking styles (Barnett et al., 2004; Barnett & Read, 2005; Caldwell, 2002; Fromme & Corbin, 2004; O’Hare & Sherrer, 1997). Almost 80% of the current respondents reported drinking at least on a monthly basis in comparison to other studies which have reported that 65 to 70% of college students reported drinking once a month or more (Hoban, 2007; O’Malley & Johnston). Further, 62.4% of the respondents in this study reported consuming at least five alcoholic beverages per typical drinking occasion in comparison to 40 to 44% of the general college population which reported this level of drinking in previous research (Hingson, Zha, & Weitzman, 2009; O’Malley & Johnston). Therefore, the higher frequency and typical amount of alcohol consumed by the participants in this study should be taken into account when considering how these implications fit with previous TPB research.
Caution should also be used when attempting to generalize any of the current findings to other samples of mandated students in future research. Because this study was conducted at only one Midwestern university, the attitudes, subjective norms, and perceived behavioral control reported by participants in this study may not be representative of drinking cultures at other universities. For example, students who do not attend a university where sports are a central focus and Greek life is less active may not experience as much social pressure to engage in high-risk drinking. Further, this sample reported that money was an influential variable in determining their attitudes toward drinking. However, a sample of college students who attend a private academic institution (where socio-economic class may be higher) may not be as conscious of the financial impact of drinking when they make decisions regarding their alcohol consumption.

Fishbein and Ajzen (2010) specified that “the relative importance or weight of these three determinants of intentions is expected to vary from one behavior to another and from one population to another” (p. 21). As Ajzen originally (1991) suggested, more researchers should engage in formative research as the first phase of study to identify the population-specific belief structure that leads to intentions and ultimately behavior. Larger scale studies may be able to identify whether college students who are mandated for alcohol intervention are comparable across different samples (e.g., varied geographic region, university size, private vs. public universities) or if measureable distinctions can be found in terms of motivational determinants leading to alcohol-related behaviors. However, in general the difficulty generalizing findings across studies may be a limitation of the TPB due to the population specificity which is called for by the theory.
Further, because the majority of the respondents in this study were White men, these findings may not apply to women or to a more racially diverse set of mandated students. Of particular note, African American students were not represented in this sample although 4% of the student population at this university is African American. The current sample consisted of mostly men (71%), whereas in the previous TPB literature of voluntary participants within the college population the majority of participants were women (e.g., Collins & Carey, 2007; Huchting et al., 2008; Johnston & White, 2003; Norman, Bennett, & Lewis, 1998). However, the findings still appear consistent with the previous research. This demographic difference may be an artifact of the current sample being mandated for intervention and therefore may indicate that more men tend to be mandated for alcohol intervention than women, however future research is needed to test this hypothesis. The overrepresentation of men in the current sample may also be responsible for the higher reported frequency and amount of alcohol consumed by the current sample as previous research has suggested that college men tend to drink more than do college women (O’Malley & Johnston, 2002). Therefore, future research which uses a larger sample size, more female participants, and more participants representing wider racial diversity may be able to identify meaningful differences between groups of mandated participants in terms of alcohol-related attitudes, perceived social pressures to engage in drinking, perceptions of control over drinking behaviors, and ultimately intentions to engage in high-risk drinking.

Another limitation of the current study is that it was constructed to only test part of the TPB model. Because this study was not longitudinal in design, the focus of testing the TPB model was limited to intentions and did not include an assessment of future
behavior. Therefore, no statements can be made about causation or the predictive validity of the TPB to explain actual alcohol-related behavior in this sample of mandated college students. A reasonable next step in this line of research is to conduct a longitudinal study which assesses the direct measures of attitude, subjective norm, perceived behavioral control, and students’ intentions to drink to intoxication and then follow up with a measure of actual behavior. Due to the findings regarding the role of social desirability in this sample’s reports of alcohol-related intentions, however, it may be beneficial to acquire both self-reports and the corroborating reports of significant others in such subsequent research which also may add to the validity of the theory.

Furthermore, the findings of this study should be considered preliminary because it is the first to examine the utility of the TPB with a sample of college students who were mandated to alcohol intervention. Further research needs to be conducted specifically with this population in order to replicate the findings and address some of the limitations noted above. For example, the performance of the perceived behavioral control measure should be re-assessed with other samples of mandated students to see if it explains statistically significant variance in alcohol-related intentions or behaviors differentially based upon reported severity of alcohol consumption.

Additionally, due to the lack of correspondence between perceived behavioral control and control beliefs, revision of the control beliefs scale is warranted. In the current study, control belief items were developed based upon themes from the elicitation study which made drinking to intoxication difficult to engage in (e.g., exams, difficult classes). A better measure may have resulted by including items which also reflected the conditions needed for drinking to intoxication (e.g., access to parties, friends who are of
drinking age, etc.). Also, future research may benefit from exploring and comparing how perceived behavioral control and self-efficacy statistically predict intentions and behavior in a mandated college student population.

Finally, although the current TPB model explained a statistically significant amount of the variance in intentions to drink to intoxication for mandated college students, further research may consider elaborating the model with other relevant variables. In this study, elaborating the model with impulsivity and aversiveness of consequence was unsuccessful, but previous research effectively elaborated the model (e.g., Cooke, Sniehotta, & Schuz, 2007); in fact, the development of the TPB was an elaboration of TRA (Ajzen, 1991). Fishbein and Ajzen (2010) leave open the possibility of adding predictors to their model with further research. Nevertheless, such research should be conducted only after considerable thought and empirical reason to believe the variable would be significantly additive to the TPB due to the possibility of threatening the theory’s parsimony.

**Practice Implications**

Despite the noted limitations of this study, there are several implications for practice which can be gathered from the findings. One of the strengths of the TPB model is that it can aid the development of theory-driven interventions and then it can also be used to evaluate these interventions. As stated previously, this study supported the use of the TPB in predicting intentions to drink to intoxication among a mandated sample of college student drinkers and it best explained intentions for particularly high-risk respondents who reported drinking frequently and heavily. Because the current study conducted formative research, it provides important information about the underlying
beliefs that lead to the alcohol-related intentions of students who have been referred for alcohol intervention. Having identified these beliefs and having determined their relative importance in the model informs the development of interventions aimed at decreasing intentions for high-risk alcohol consumption in this population.

First, Fishbein and Ajzen (2010) recommended that interventions should target the component of the TPB which exerted the most influence in predicting intentions to drink to intoxication. Due to the direct measure of attitude and its corresponding indirect measure of behavioral beliefs both emerging as statistically significant determinants of intention, it appears that interventions which focus intensely on these variables may be most effective in changing intentions to drink to intoxication in mandated college students. Respondents in this study identified more benefits of drinking to intoxication than costs which likely reflects their commitment to their drinking behaviors. Practitioners therefore will be challenged to change these attitudes in this population by increasing students’ perceptions of the number and importance of their negative consequences and decreasing the number and importance of the benefits of drinking to intoxication. Because participants in this sample reported that considerations over getting poor grades and spending money were salient when they make decisions about drinking to intoxication, interventions may benefit from emphasizing these particularly concrete consequences (grades and money) related to drinking to intoxication and specifically explore with these students how their grades and financial concerns may be related to their alcohol consumption.

For example, in an individually-based intervention, if grades and financial problems are particularly stressful for a student, then developing goals around
minimizing alcohol consumption may be framed as one strategy for solving these problems. A possibility for a community intervention may include limiting drink specials at local bars such that if students choose to drink their finances will be more negatively affected. The academic community could also aid in prevention by scheduling classes on Friday mornings so as to discourage the common “Thirsty Thursdays” phenomenon in which students tend to begin their weekend drinking on Thursday nights. In addition to emphasizing these consequences, it seems that group-based interventions would benefit by educating mandated students about the range of other negative alcohol-related consequences in order to make these behavioral beliefs more salient as students make decisions about alcohol consumption.

In addition to negative consequences, these participants also noted several benefits to drinking to intoxication such as increased opportunities to socialize, meeting new people, and having fun. Interventions could challenge these perceived benefits by helping students to identify whether these experiences are as likely and as positive as their expectations. Further, both individual and group-based interventions may include discussions and interactive exercises to help students develop ideas about how they could get the same positive social effects without drinking to intoxication.

Perceived social pressure was also a statistically significant determinant of intention in this study, suggesting that this would be another variable for focus in interventions developed for mandated students. Through identifying the normative beliefs for the current sample the following referents were deemed by the participants to be of most importance when making decisions about drinking to intoxication: friends, other college students, and parents. Interventions for mandated students could be aimed
at reducing high-risk alcohol consumption in a mandated population by helping students to identify the real and perceived pressure they feel from these referents to drink to intoxication.

Some universities have been addressing the issue of college students’ perceptions of peer pressure with social norms marketing (Wechsler, Kelley, Weitzman, SanGiovanni, & Seibring, 2000). This approach is based upon previous research which reported that college students tend to significantly misperceive peers’ alcohol use, believing that other college students drink more heavily and frequently than they actually do (Baer, Stacy, & Larimer, 1991). Social norms campaigns involve using mass media to inform college students that, despite their perceptions, the majority of their peers are actually moderate drinkers (Reilly & Wood, 2008). Through an extension of this work, future practice and research could explore whether college students also misperceive the alcohol-related expectations they feel from important others. In other words, do college students really approve of their peers “drinking to get drunk” and disapprove of peers who do not “drink to get drunk”? If this is indeed a common misperception, college students could be educated that peer-acceptance does not necessarily rely upon heavy alcohol consumption.

In addition to peer expectations, mandated college students also seemed to place a great deal of importance upon parents’ expectations. The results of the current study indicate that involving parents in alcohol intervention efforts may be beneficial for decreasing these students’ intentions to drink to intoxication. These interventions could help parents understand the overt and covert messages they provide to their children about alcohol consumption in college. For example, parents may inadvertently
communicate approval of high-risk drinking if they share their tall tales of drinking when they were in college. Yet another possibility is that parents may approve of responsible drinking in college but not excessive drinking; however this message is not accurately conveyed to their children. If students are helped to increase their awareness of the differences between the social and parental approval of responsible drinking versus high-risk drinking this may encourage students to engage in less dangerous alcohol consumption.

Finally, this study suggests that for the heaviest and most frequent drinkers among the mandated population adding interventions to change their perceived control over their drinking behaviors may be beneficial. In this way, the current study would support different interventions for mandated students who are high-risk drinkers vs. mandated students who are more responsible drinkers. This implication points to a need for more individualized alcohol interventions, rather than assuming homogenous alcohol-use patterns in mandated samples of college students. Interventions could help students increase their perceptions of the control they have over alcohol consumption by emphasizing their personal agency when making decisions about drinking. Further, by utilizing role-play exercises practicing drink refusal strategies, exploring ideas for setting limits on alcohol consumption, and teaching students how to monitor their consumption, they may feel they have more resources available to them to drink responsibly when they choose to drink.

**Concluding Remarks**

The current study extended research which has examined the explanatory power of the TPB for alcohol-related intentions. In particular, this was the first study to use the
TPB to explain intentions to drink to intoxication among a sample of college students who were mandated to alcohol intervention. Although this study supported previous research which demonstrated that attitudes toward alcohol consumption and perceived pressure to engage in alcohol consumption explain unique variance in high-risk drinking, it also identified the role that social desirability plays in mandated students’ self-reports of intentions to drink to intoxication. Further, this study suggested that perceived control over drinking is only influential in explaining alcohol-related intentions for mandated students who drink most frequently and most heavily.

The results of the current study lend support to Ajzen’s (1991) contention that other variables such as impulsivity and aversiveness of consequence are not proximal determinants of behavioral intentions but are more likely mediated by attitudes toward a behavior, the perceived pressures to engage in a behavior, and the perceived control over a behavior. Subsequent research to examine causal relations would benefit from utilizing a prospective measure of behavior to determine whether the TPB is able to account for a significant amount of variance in actual high-risk alcohol consumption. Further, the current study’s findings suggest that formative research may help to identify the underlying salient beliefs that affect these college students’ alcohol-related intentions. In this way, the TPB may facilitate the development and evaluation of alcohol interventions for college students who are mandated to treatment due to legal and university violations.
REFERENCES


APPENDICES
APPENDIX A

RESEARCH INFORMATION SHEET

College Students’ and Alcohol Consumption
Colleen Maguire, M.A.
Counseling and Psychological Services (CAPS), Purdue University

Introduction
You are invited to participate in a research study being conducted by Colleen Maguire, M.A. and Linda Subich, Ph.D. in the Department of Psychology at the University of Akron in collaboration with Susan Prieto-Welch, Ph.D. at Counseling and Psychological Services (CAPS), Purdue University.

Purpose of Research
The purpose of this study is to investigate the underlying beliefs and attitudes which are related to the choices college students make regarding alcohol consumption. Approximately 75 students are being sought for their participation.

Specific Procedures to be Used
To participate in this study you will be asked to complete a paper and pencil survey packet; you will also be asked to answer several demographic questions.

Duration of Participation
Your participation in this study will involve a one-time commitment of approximately twenty to thirty minutes.

Benefits to the Individual
This study is not designed to provide you direct benefit, though you may increase self-awareness about your choices regarding alcohol consumption. It is hoped that information gathered from this study will ultimately facilitate counseling center personnel in their efforts to develop effective alcohol-related interventions.

Risks and Discomforts to the Individual
The risks and discomforts involved in participating in this study include that you will be asked to donate your time to complete the survey. Also, you may be asked to provide
some potentially sensitive information regarding your attitudes and beliefs about alcohol consumption, which could lead to some emotional discomfort if the questions cause you to reflect upon aspects of yourself that are unpleasant to you. There are no anticipated physical risks. If after completing this questionnaire, you would like to speak further with a counselor regarding your alcohol use you can choose to request a consultation by contacting Counseling and Psychological Services at 494-6995.

**Anonymous and Confidential Data Collection**
This study is anonymous, confidential, and no personal identifying information will be solicited from you. Your anonymity is further protected by not asking you to sign and return an informed consent form.

**Confidentiality of Records**
Raw data will be aggregated and stored in a securely locked cabinet at Counseling and Psychological Services (CAPS) at Purdue University and these data will be shredded after five years. The project's research records may be reviewed by departments at Purdue University and The University of Akron responsible for regulatory and research oversight.

**Voluntary Nature of Participation**
Participation in this research project is voluntary. If you agree to participate you can withdraw your participation at any time without penalty. You may skip any question that you feel uncomfortable answering. Non-participation will in no way influence your alcohol-related diversion program or affect your standing with the university or your instructor.

**Who to Contact with Questions:**
If you have any questions about this research project, you can contact Susan Prieto-Welch, Ph.D., or Colleen Maguire, M.A. at 765-494-6995. Alternatively, you can contact Linda Subich, Ph.D. at The University of Akron at 330-972-8379.

**Human Subject Statement:**
This project has been reviewed and approved by The University of Akron Institutional Review Board and the Institutional Review Board at Purdue University. If you have any questions about your rights as a research participant, you may call The University of Akron’s IRB at (330) 972-7666. Alternatively, you can contact the Institutional Review Board at Purdue University, Ernest C. Young Hall, Room 1032, 155 S. Grant St., West Lafayette, IN 47907-2114. The phone number for the Board is (765) 494-5942. The email address is irb@purdue.edu.
APPENDIX B

QUESTIONNAIRE COVER PAGE

The instructor of your alcohol class is NOT involved in this study and will NOT see your responses. Your choice to participate will not affect your standing with your instructor. Please also be assured that the information you provide will not affect your standing with the university or the court which referred you to Counseling and Psychological Services (CAPS).

All responses to this survey are completely confidential and anonymous; you will not be asked to provide your name anywhere on this survey.

The pages of this questionnaire are two-sided. Please make sure to complete both sides.

Thank you for your participation in this study.
APPENDIX C
ELICITATION SURVEY

Description: We are interested in factors that impact college students’ choices regarding alcohol consumption. We would appreciate your responses to some questions about this topic. There are no right or wrong answers and you may skip any item or end participation at any time.

Note: For the purposes of this study, “drink to intoxication” means: “to get drunk”
Intoxication may involve ANY of the following behavioral markers:

- drinking to “get drunk”
- slurred speech
- loss of coordination
- loss of balance
- inability to focus vision
- very loud behavior
- very withdrawn behavior

Your answers are completely anonymous; please tell us what you really think about drinking and “getting drunk.”

1. What do you believe are the benefits of drinking to intoxication while you are a college student?

2. What do you believe are the costs of drinking to intoxication while you are a college student?

3. What other ideas come to mind when you think about drinking to intoxication while you are a college student?
4. What individuals or groups of people would approve of you drinking to intoxication while you are a college student? Please list general relationships to individuals rather than specific names.

5. What individuals or groups of people would disapprove of you drinking to intoxication while you are a college student? Please list general relationships to individuals rather than specific names.

6. What other ideas come do you associate with other people’s views about drinking to intoxication while you are a college student?

7. What factors or circumstances would enable you (make it easier) to drink to intoxication while you are a college student?

8. What factors or circumstances would make it difficult or impossible for you to drink to intoxication while you are a college student?

9. What other factors or circumstances come to mind when you think about drinking to intoxication while you are a college student?
APPENDIX D

BELIEFS SURVEY – INDIRECT MEASURES

Instructions. Please answer each of the questions by circling the number that best describes your opinion on getting drunk while you are a college student. Please do not circle more than one number for each question. Some of the questions may appear to be similar, but they do address somewhat different issues. Please read each question carefully.

1. If I had difficult classes or a heavy class schedule, I would get drunk less often:

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>Strongly Agree</th>
</tr>
</thead>
</table>

2. Poor grades are:

<table>
<thead>
<tr>
<th>Very Undesirable</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>Very Desirable</th>
</tr>
</thead>
</table>

3. If my friends discouraged me from getting drunk, it would make it more difficult for me to get drunk.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>Strongly Agree</th>
</tr>
</thead>
</table>

4. I feel less stressed when I get drunk.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>Strongly Agree</th>
</tr>
</thead>
</table>
5. If I get drunk, I will have a hangover.

Very Unlikely

6. What my parents/legal guardian think about my drinking behavior is important to me.

Not at All

7. Having social opportunities is:

Extremely Desirable

8. My religious leaders would approve of me getting drunk while I’m in college.

Extremely Disapprove

9. If I get drunk while I’m in college, I’ll make bad decisions.

Very Unlikely

10. What my friends think about my drinking behavior matters to me.

Not at All

11. If I get drunk while I’m in college, I will get more poor grades.

Very Unlikely
12. Meeting new people when I’m drunk is:

| Extremely Undesirable | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Extremely Desirable |

13. If I had an exam the next day, I would be less likely to get drunk:

| Strongly Disagree | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Strongly Agree |

14. Making bad decisions related to drinking is:

| Extremely Undesirable | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Extremely Desirable |

15. My parents/legal guardian approves of me getting drunk while I’m in college.

| Strongly Disagree | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Strongly Agree |

16. How often do difficult classes or a heavy class schedule put significant demands on your time?

| Very Rarely | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Very Frequently |

17. If I get drunk while I’m in college, I will spend a lot of money on alcohol.

| Very Unlikely | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Very Likely |

18. How often do you feel that you can’t get access to alcohol?

| Very Rarely | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Very Frequently |

163
19. Other college students approve of me getting drunk.

Strongly Disagree
1 2 3 4 5 6 7 Strongly Agree

20. Feeling less stressed is:

Extremely Undesirable
1 2 3 4 5 6 7 Extremely Desirable

21. How frequently do your friends discourage you from getting drunk?

Very Rarely
1 2 3 4 5 6 7 Very Frequently

22. My professors’ opinions about my drinking behaviors are important to me.

Not at All
1 2 3 4 5 6 7 Very Much

23. How frequently do you avoid getting drunk because you have an exam coming up the next day?

Very Rarely
1 2 3 4 5 6 7 Very Frequently

24. If I get drunk while I’m in college, I will be able to relax easier.

Very Unlikely
1 2 3 4 5 6 7 Very Likely

25. Getting drunk in college increases my social opportunities.

Very Unlikely
1 2 3 4 5 6 7 Very Likely
26. Other college students’ approval of my drinking behavior is important to me.
Not at All 1 2 3 4 5 6 7 Very Much

27. My religious leader’s opinions about my drinking matters to me.
Not at All 1 2 3 4 5 6 7 Very Much

28. Having fun in college is:
Extremely 1 2 3 4 5 6 7 Extremely Desirable
Undesirable

29. If I get drunk while I’m in college, I will have health problems.
Very 1 2 3 4 5 6 7 Very Likely
Unlikely

30. Hangovers are:
Extremely 1 2 3 4 5 6 7 Extremely Desirable
Undesirable

31. Getting drunk in college will lead to legal problems.
Very 1 2 3 4 5 6 7 Very Likely
Unlikely

32. It is usually hard for me to find access to alcohol:
Strongly 1 2 3 4 5 6 7 Strongly Agree
Disagree
33. My friends think I should get drunk while I’m in college.

Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

34. If I get drunk while I’m in college, I will have fun.

Very Unlikely 1 2 3 4 5 6 7 Very Likely

35. Getting drunk allows me to meet new people.

Very Unlikely 1 2 3 4 5 6 7 Very Likely

36. Increasing my health problems is:

Extremely Unlikely 1 2 3 4 5 6 7 Extremely Desirable

37. Spending my money on alcohol is:

Extremely Unlikely 1 2 3 4 5 6 7 Extremely Desirable

38. Legal problems are:

Extremely Unlikely 1 2 3 4 5 6 7 Extremely Desirable

166
39. My professors would approve of me getting drunk while I’m in college.

| Strongly Disagree | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Strongly Agree |

40. Feeling more relaxed is:

| Extremely Undesirable | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Extremely Desirable |
APPENDIX E

TPB QUESTIONNAIRE – DIRECT MEASURES

Instructions. Please answer each of the questions by circling the number that best describes your opinion on getting drunk while you are a college student. Please do not circle more than one number for each question. Some of the questions may appear to be similar, but they do address somewhat different issues. Please read each question carefully.

1. I will get drunk while I’m in college.

Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

2. Getting drunk while I’m in college is:

Very Worthless 1 2 3 4 5 6 7 Very Valuable

3. Getting drunk while I’m in college is:

Very Safe 1 2 3 4 5 6 7 Very Risky

4. The decision to get drunk while I’m in college is out of my control.

Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree
5. I am confident that I can moderate my drinking while I’m in college.

Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

6. I expect to get drunk while I’m in college.

Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

7. Most people who are important to me think that I should get drunk while I’m in college.

Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

8. Getting drunk while I’m in college is:

Very Bad 1 2 3 4 5 6 7 Very Good

9. I intend to get drunk while I’m in college.

Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

10. I feel under social pressure to get drunk while I’m in college.

Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

11. I want to get drunk while I’m in college.

Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

169
12. Most people who are similar to me get drunk while they are in college.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>Strongly Agree</th>
</tr>
</thead>
</table>

13. It is expected of me that I get drunk while I’m in college.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>Strongly Agree</th>
</tr>
</thead>
</table>

14. Getting drunk while I’m in college is:

<table>
<thead>
<tr>
<th>Very Unpleasant</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>Very Pleasant</th>
</tr>
</thead>
</table>

15. I could avoid situations where getting drunk is likely to occur if I wanted to.

<table>
<thead>
<tr>
<th>Very Unlikely</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>Very Likely</th>
</tr>
</thead>
</table>

16. Most people who are important to me get drunk while they are in college.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>Strongly Agree</th>
</tr>
</thead>
</table>

17. My drinking behavior is entirely up to me.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>Strongly Agree</th>
</tr>
</thead>
</table>
18. The people in my life whose opinions I value approve of me getting drunk while I’m in college.

Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

19. I can resist the pressure from my friends to get drunk while I’m in college.

Very Unlikely 1 2 3 4 5 6 7 Very Likely
APPENDIX F

UPPS IMPULSIVE BEHAVIOR SCALE

Instructions. Below are a number of statements that describe ways in which people act and think. For each statement, please indicate how much you agree or disagree with the statement.

<table>
<thead>
<tr>
<th></th>
<th>Strongly Agree</th>
<th>Agree Some</th>
<th>Disagree Some</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I have a reserved and cautious attitude toward life.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>2. I have trouble controlling my impulses.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>3. I generally seek new and exciting experiences and sensations.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>4. I generally like to see things through to the end.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>5. My thinking is usually careful and purposeful.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>6. I have trouble resisting my cravings (for food, cigarettes, etc.).</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>7. I'll try anything once.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>8. I tend to give up easily.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>9. I am not one of those people who blurt out things without thinking.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>10. I often get involved in things I later wish I could get out of.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Strongly Agree</td>
<td>Agree Some</td>
<td>Disagree Some</td>
<td>Strongly Disagree</td>
</tr>
<tr>
<td>---</td>
<td>----------------</td>
<td>------------</td>
<td>----------------</td>
<td>------------------</td>
</tr>
<tr>
<td>11.</td>
<td>I like sports and games in which you have to choose your next move very quickly.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>12.</td>
<td>Unfinished tasks really bother me.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>13.</td>
<td>I like to stop and think things over before I do them.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>14.</td>
<td>When I feel bad, I will often do things I later regret in order to make myself feel better now.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>15.</td>
<td>I would enjoy water skiing.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>16.</td>
<td>Once I get going on something I hate to stop.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>17.</td>
<td>I don’t like to start a project until I know exactly how to proceed.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>18.</td>
<td>Sometimes when I feel bad, I can’t seem to stop what I am doing though it is making things worse.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>19.</td>
<td>I quite enjoy taking risks.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>20.</td>
<td>I concentrate easily.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>21.</td>
<td>I would enjoy parachute jumping.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>22.</td>
<td>I finish what I start.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>23.</td>
<td>I tend to value and follow a rational, “sensible” approach to things.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>24.</td>
<td>When I am upset I often act without thinking.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>25.</td>
<td>I welcome new and exciting experiences and sensations, even if they are a little frightening and unconventional.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>26.</td>
<td>I am able to pace myself so as to get things done on time.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>27.</td>
<td>I usually make up my mind through careful reasoning.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>28.</td>
<td>When I feel rejected, I will often say things that I later regret.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>29.</td>
<td>I would like to learn to fly an airplane.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>30.</td>
<td>I am a person who always gets the job done.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>31.</td>
<td>I am a cautious person.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>32.</td>
<td>It is hard for me to resist acting on my feelings.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>33.</td>
<td>I sometimes like doing things that are a bit frightening.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>34.</td>
<td>I almost always finish projects that I start.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>35.</td>
<td>Before I get into a new situation I like to find out what to expect from it.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>36.</td>
<td>I often make matters worse because I act without thinking when I am upset.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>37.</td>
<td>I would enjoy the sensation of skiing very fast down a high mountain slope.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>38.</td>
<td>Sometimes there are so many little things to be done that I just ignore them all.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>39.</td>
<td>I usually think carefully before doing anything.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Statement</td>
<td>Strongly Agree</td>
<td>Agree Some</td>
<td>Disagree Some</td>
</tr>
<tr>
<td>---</td>
<td>---------------------------------------------------------------------------</td>
<td>----------------</td>
<td>------------</td>
<td>---------------</td>
</tr>
<tr>
<td>40.</td>
<td>Before making up my mind, I consider all the advantages and disadvantages.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>41.</td>
<td>In the heat of an argument, I will often say things that I later regret.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>42.</td>
<td>I would like to go scuba diving.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>43.</td>
<td>I always keep my feelings under control.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>44.</td>
<td>I would enjoy fast driving.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>45.</td>
<td>Sometimes I do impulsive things that I later regret.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>
APPENDIX G

AVERSIVENESS OF CONSEQUENCE SCALE

Instructions. Using the scales below as a guide, please circle the number that indicates your response from Not at All (1) to Very Much (7).

1. To what extent has the alcohol-related incident that brought you here upset you?
   Not at All 1 2 3 4 5 6 7 Very Much

2. When thinking about this alcohol-related incident, how badly do you feel about it?
   Not at All 1 2 3 4 5 6 7 Very Much

3. How unpleasant was this alcohol-related incident for you?
   Not at All 1 2 3 4 5 6 7 Very Much
APPENDIX H

BIDR, VERSION 6

Instructions. Using the scale below as a guide, please circle the number that indicates your response from Not at All True (1) to Very True (7).

1. My first impression of people usually turns out to be right.
   Not at All True 1 2 3 4 5 6 7 Very True

2. It would be hard for me to break any of my bad habits.
   Not at All True 1 2 3 4 5 6 7 Very True

3. I don’t care to know what other people really think of me.
   Not at All True 1 2 3 4 5 6 7 Very True

4. I have not always been honest with myself.
   Not at All True 1 2 3 4 5 6 7 Very True

5. I always know why I like things.
   Not at All True 1 2 3 4 5 6 7 Very True
6. When my emotions are aroused, it biases my thinking.

<table>
<thead>
<tr>
<th>Not at All</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>Very True</th>
</tr>
</thead>
<tbody>
<tr>
<td>True</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

7. Once I have made up my mind, other people can seldom change my opinion.

<table>
<thead>
<tr>
<th>Not at All</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>Very True</th>
</tr>
</thead>
<tbody>
<tr>
<td>True</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

8. I am not a safe driver when I exceed the speed limit.

<table>
<thead>
<tr>
<th>Not at All</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>Very True</th>
</tr>
</thead>
<tbody>
<tr>
<td>True</td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

9. I am fully in control of my own fate.

<table>
<thead>
<tr>
<th>Not at All</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>Very True</th>
</tr>
</thead>
<tbody>
<tr>
<td>True</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

10. It’s hard for me to shut off a disturbing thought.

<table>
<thead>
<tr>
<th>Not at All</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>Very True</th>
</tr>
</thead>
<tbody>
<tr>
<td>True</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

11. I never regret my decisions.

<table>
<thead>
<tr>
<th>Not at All</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>Very True</th>
</tr>
</thead>
<tbody>
<tr>
<td>True</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

12. I sometimes lose out on things because I can’t make up my mind soon enough.

<table>
<thead>
<tr>
<th>Not at All</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>Very True</th>
</tr>
</thead>
<tbody>
<tr>
<td>True</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
13. The reason I vote is because my vote can make a difference.

Not at All  1  2  3  4  5  6  7  Very True
True

14. My parents were not always fair when they punished me.

Not at All  1  2  3  4  5  6  7  Very True
True

15. I am a completely rational person.

Not at All  1  2  3  4  5  6  7  Very True
True

16. I rarely appreciate criticism.

Not at All  1  2  3  4  5  6  7  Very True
True

17. I am very confident of my judgments.

Not at All  1  2  3  4  5  6  7  Very True
True

18. I have sometimes doubted my ability as a lover.

Not at All  1  2  3  4  5  6  7  Very True
True

19. It’s all right with me if some people happen to dislike me.

Not at All  1  2  3  4  5  6  7  Very True
True
20. I don’t always know the reasons why I do the things I do.

| Not at All | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Very True |
| True       |   |   |   |   |   |   |   |           |

21. I sometimes tell lies if I have to.

| Not at All | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Very True |
| True       |   |   |   |   |   |   |   |           |

22. I never cover up my mistakes.

| Not at All | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Very True |
| True       |   |   |   |   |   |   |   |           |

23. There have been occasions when I have taken advantage of someone.

| Not at All | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Very True |
| True       |   |   |   |   |   |   |   |           |

24. I never swear.

| Not at All | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Very True |
| True       |   |   |   |   |   |   |   |           |

25. I sometimes try to get even rather than forgive and forget.

| Not at All | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Very True |
| True       |   |   |   |   |   |   |   |           |

26. I always obey laws, even if I’m unlikely to get caught.

<p>| Not at All | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Very True |
| True       |   |   |   |   |   |   |   |           |</p>
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>27.</td>
<td>I have said something bad about a friend behind his or her back.</td>
</tr>
<tr>
<td></td>
<td>Not at All 1 2 3 4 5 6 7 Very True True</td>
</tr>
<tr>
<td>28.</td>
<td>When I hear people talking privately, I avoid listening.</td>
</tr>
<tr>
<td></td>
<td>Not at All 1 2 3 4 5 6 7 Very True True</td>
</tr>
<tr>
<td>29.</td>
<td>I have received too much change from a salesperson without telling him or her.</td>
</tr>
<tr>
<td></td>
<td>Not at All 1 2 3 4 5 6 7 Very True True</td>
</tr>
<tr>
<td>30.</td>
<td>I always declare everything at customs.</td>
</tr>
<tr>
<td></td>
<td>Not at All 1 2 3 4 5 6 7 Very True True</td>
</tr>
<tr>
<td>31.</td>
<td>When I was young I sometimes stole things.</td>
</tr>
<tr>
<td></td>
<td>Not at All 1 2 3 4 5 6 7 Very True True</td>
</tr>
<tr>
<td>32.</td>
<td>I have never dropped litter on the street.</td>
</tr>
<tr>
<td></td>
<td>Not at All 1 2 3 4 5 6 7 Very True True</td>
</tr>
<tr>
<td>33.</td>
<td>I sometimes drive faster than the speed limit.</td>
</tr>
<tr>
<td></td>
<td>Not at All 1 2 3 4 5 6 7 Very True True</td>
</tr>
</tbody>
</table>

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34. I never read sexually explicit books or look at pornography.
Not at All  1  2  3  4  5  6  7  Very True
True

35. I have never done things that I don’t tell other people about.
Not at All  1  2  3  4  5  6  7  Very True
True

36. I never take things that don’t belong to me.
Not at All  1  2  3  4  5  6  7  Very True
True

37. I have taken sick-leave from work or school even though I wasn’t really sick.
Not at All  1  2  3  4  5  6  7  Very True
True

38. I have never damaged a library book or store merchandise without reporting it.
Not at All  1  2  3  4  5  6  7  Very True
True

39. I have some pretty awful habits.
Not at All  1  2  3  4  5  6  7  Very True
True

40. I don’t gossip about other people’s business.
Not at All  1  2  3  4  5  6  7  Very True
True
APPENDIX I

DEMOGRAPHIC SURVEY

Please indicate your age and place an “X” next to the appropriate demographic descriptors. The information below will not be used to identify you individually.

1. Age: ________
2. Sex: _______Male   ______Female
   ______Transgender
3. Race/Ethnicity:
   ______African-American (Black)
   ______Asian-American
   ______Biracial / Multiracial American
   ______Hispanic or Latino American
   ______Native American (American Indian)
   ______White / European American
   ______International Student (National Origin: ________________________)
4. Academic Standing:
   ______First year undergraduate
   ______Sophomore
   ______Junior
   ______Senior
   ______Other (specify: ____________________________)
5. How were you referred to Counseling and Psychological Services (CAPS)?
   _______Court-Referred _______University Residences

6. Have you had other/previous alcohol-related charges or alcohol–related violations?
   _______No _______Yes (How Many? _______)

7. When did the alcohol-related incident that led to your attendance in this program occur?
   Month _______________ Year ___________

8. How often do you have a drink containing alcohol?
   _______Never
   _______Once a month or less
   _______Two to Four times per month
   _______Two to Three times per week
   _______Four or More times per week

9. How many alcoholic beverages do you consume on a typical occasion when you drink?
   _______One or Two
   _______Three or Four
   _______Five or Six
   _______Seven or Eight
   _______Nine or More
APPENDIX J

HUMAN SUBJECTS APPROVAL FORM – SCHOOL A

To: SUSAN PRIETO-WELCH
PSYC 1142

From: RICHARD MATTES, Chair
Social Science IRB

Date: 11/18/2009

Committee Action: Expedited Approval

IRB Action Date: 11/17/2009
IRB Protocol #: 0910008509

Study Title: Predicting High-Risk College Alcohol Consumption with the Theory of Planned Behavior

Expiration Date: 11/16/2010

Following review by the Institutional Review Board (IRB), the above referenced protocol has been approved. This approval permits you to recruit subjects up to the number indicated on the application form and to conduct the research as it is approved. The IRB-stamped and dated consent, assent, and/or information form(s) approved for this protocol are enclosed. Please make copies from these document(s) both for subjects to sign should they choose to enroll in your study and for subjects to keep for their records. Information forms should not be signed. Researchers should keep all consent/assent forms for a period no less than three (3) years following closure of the protocol. (7)

Revisions/Amendments: If you wish to change any aspect of this study, please submit the requested changes to the IRB using the appropriate form. IRB approval must be obtained before implementing any changes unless the change is to remove an immediate hazard to subjects in which case the IRB should be immediately informed following the change.

Continuing Review: It is the Principal Investigator’s responsibility to obtain continuing review and approval for this protocol prior to the expiration date noted above. Please allow sufficient time for continued review and approval. No research activity of any sort may continue beyond the expiration date. Failure to receive approval for continuation before the expiration date will result in the approval’s expiration on the expiration date. Data collected following the expiration date is unapproved research and cannot be used for research purposes including reporting or publishing as research data.

Unanticipated Problems/Adverse Events: Researchers must report unanticipated problems and/or adverse events to the IRB. If the problem/adverse event is serious, or is expected but occurs with unexpected severity or frequency, or the problem/event is unanticipated, it must be reported to the IRB within 48 hours of learning of the event and a written report submitted within five (5) business days. All other problems/events should be reported at the time of Continuing Review.

We wish you good luck with your work. Please retain copy of this letter for your records.
APPENDIX K
HUMAN SUBJECTS APPROVAL FORM – SCHOOL B

NOTICE OF APPROVAL

Date: October 9, 2009

To: Colleen P. Maguire
3035 Courthouse Drive W 2A
West Lafayette, IN 47906

From: Sharon McWhorter, IRB Administrator

Re: IRB Number 20091003 “Predicting High-Risk College Alcohol Consumption with the Theory of Planned Behavior”

Thank you for submitting your IRB Application for Review of Research involving Human Subjects for the referenced project. Your application was approved on October 8, 2009. Your protocol represents minimal risk to subjects and matches the following federal category for exemption:

☐ Exemption 1 - Research conducted in established or commonly accepted educational settings, involving normal educational practices.

☒ Exemption 2 - Research involving the use of educational tests, survey procedures, interview procedures, or observation of public behavior.

☐ Exemption 3 - Research involving the use of educational tests, survey procedures, interview procedures, or observation of public behavior not exempt under category 2, but subjects are elected or appointed public officials or candidates for public office.

☐ Exemption 4 - Research involving the collection or study of existing data, documents, records, pathological specimens, or diagnostic specimens.

☐ Exemption 5 - Research and demonstration projects conducted by or subject to the approval of department or agency heads, and which are designed to study, evaluate, or otherwise examine public programs or benefits.

☐ Exemption 6 - Taste and food quality evaluation and consumer acceptance studies.

Annual continuation applications are not required for exempt projects. If you make changes to the study’s design or procedures that increase the risk to subjects or include activities that do not fall within the approved exemption category, please contact me to discuss whether or not a new application must be submitted. Any such changes or modifications must be reviewed and approved by the IRB prior to implementation.

Please retain this letter for your files. If the research is being conducted for a master’s thesis or doctoral dissertation, the student must file a copy of this letter with the thesis or dissertation.

☒ Approved consent form/s enclosed

Cc: Linda Subich - Advisor
Cc: Stephanie Woods - IRB Chair

Office of Research Services and Sponsored Programs
Avon, OH 44325-2102
330-972-7080 • 330-972-6281 Fax

The University of Akron is an Equal Education and Employment Institution
APPENDIX L

OPEN-ENDED FEEDBACK SOUGHT FROM PILOT PARTICIPANTS AND COMMENTS REGARDING THE SURVEY

Thank you for helping me test this questionnaire!
What did you think about it:

1. Are any of the questions hard to answer?
   Some of the questions had a 1-7 scale when they could’ve been a yes or no question.
   No.
   No.
   No.
   No.
   No.
   No.
   No.
   Not really, it was straight forward.
   No.
   No.
   No.

2. Do some of the questions sound too similar?
   Yes, good way to emphasize and check for consistency.
   Yes.
   Yes.
   Way too many were similar...it was annoying.
   All of them.
   Yes.
   Yes!
   Yes.
   Yes some questions seemed the same for me.
   Yes.
   Yes.
   Yes.
3. Was it too long?
   *Kind of, you repeated too much some questions.*
   Yes.
   No.
   No.
   Yes.
   A little bit, yes.
   Yes.
   Yes, a little bit too much.
   Sort of.
   No.
   Yes.

4. Did it bother you to answer any of the questions?
   No.
   No.
   No.
   The same questions bothered me.
   No.
   No.
   No.
   No.
   No.
   No.
   I didn’t want to answer the religious question. Also, instead of parents you might want to add legal guardian.
   No.
   No.

5. Were there any questions that I should have asked about drinking that I did not ask?
   No.
   No.
   *When you first started drinking.*
   No.
   No.
   No.
   No.
   Can’t think of any.
   No.
   No.
   No.
6. Do you have any suggestions to improve this survey?
   No, hope the comments help.
   No.
   No.
   No.
   No.
   Nope, see #4.
   Take off some of the questions that are pretty much the same.
   No.

   Thank You!