SENSATION SEEKING, DRINKING MOTIVES, AND PERCEIVED NORMS AS MEDIATORS OF THE ASSOCIATION BETWEEN COLLEGE MAJOR AND DRINKING PATTERNS

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ABSTRACT

Sensation Seeking, Drinking Motives, and Perceived Norms as Mediators of the Association Between College Major and Drinking Patterns

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Excessive drinking on college campuses has been investigated extensively in psychological literature. While some studies suggest that business students are consuming alcohol at higher rates than students in other majors, there is a lack of research exploring mechanisms that account for this consumption difference. The focus of this study was to determine to what extent the following variables mediated the relationship between choice of major and drinking behavior: drinking motives, perceived drinking norms for that major, primary psychopathy, and sensation seeking. A total of 169 undergraduate students completed survey packets assessing the following: alcohol consumption (e.g., binge drinking frequency, drinking frequency, and drinking problems), trait anxiety, sensation seeking tendencies, perceived drinking norms, psychopathy, social desirability, and professed motives behind their alcohol consumption. The initial MANCOVA revealed a nonsignificant omnibus $F$, technically precluding exploration of the subsequent univariate ANOVAs. However, for teaching purposes as well as to explore directions for future research, the complete proposed analyses were
conducted. Thus, the results of this study should be interpreted with caution. The first set of univariate ANOVA results indicated that business students and arts and sciences students only significantly differed from each other in binge drinking frequency. Contrary to hypotheses, the results revealed that drinking motives, sensation seeking tendencies, and primary psychopathy did not mediate the relationship between choice of major and binge drinking frequency. The results did indicate that perceived drinking norms for that major fully mediated the relationship between choice of major and binge drinking frequency. Business students may engage in binge drinking more frequently than arts and sciences students due to the perceived drinking norms within their major. That is, while business students did report engaging in binge drinking more frequently, they may also be overestimating the actual amount of alcohol others in their major consume. Therefore, they might consume more alcohol themselves in order to match their perceptions. Although the above results should be interpreted with caution, the treatment and prevention implications include education concerning perceived versus actual drinking norms on college campuses as well as treatment focused on changing the culture surrounding alcohol consumption for business majors.
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CHAPTER I
INTRODUCTION

Excessive drinking on college campuses has been investigated extensively in psychological literature (Ham & Hope, 2003; Kandel & Logan, 1984; Vik, Carello, Tate, & Field, 2000; Wechsler, Molnar, Davenport, & Baer, 1999). In this literature, many factors have been found to be associated with college drinking, such as being male, being Anglo-American or Hispanic, binge drinking in high school, alcohol expectancies, moderate stress levels, Greek system membership, lack of religiosity, peers and family that consume excess alcohol, high levels of sensation seeking or neuroticism, and drinking motives (Ham & Hope, 2003) to name just a few. One form of problem drinking, binge drinking, has been defined by social scientists and leaders of alcohol-based programming as consuming at least five consecutive standard drinks in one sitting for men and four for women, with a standard drink being twelve ounces of beer, four ounces of wine, twelve ounces of wine cooler, or one and a quarter shot of liquor (Ham & Hope, 2003). It is binge and frequent drinking in particular that often lead to a host of negative consequences for college students (Hingston, Heeren, Zakocs, Kopstein, & Wechsler, 2001; Ullman, Karabatsos, & Koss, 1999; Wechsler, Davenport, Dowdall, Moeykens, & Castillo, 1994).

Further, some college drinking literature suggests that business school students consume alcohol more frequently and in higher amounts than peers in other schools
(Markland, Rye, & Lander, 2008; Vansteenkiste, Duriez, Simons, & Soenens, 2006; Waring, Petraglia, Cohen, & Busby, 1984a, 1984b). However, there is a lack of research exploring mechanisms that might account for this consumption difference. The focus of this study was to determine to what extent the following variables mediated the relationship between choice of major and drinking behavior: drinking motives, perceived drinking norms for that major, sensation seeking tendencies, and primary psychopathy. In the remainder of this introduction, I briefly will review the problematic and dangerous nature of college drinking, explore the relationship between each hypothesized mediator and alcohol consumption, and outline my proposed hypotheses.

**College Drinking as Problematic**

Data collected by the U.S. Department of Health and Human Services (1997) suggests that young adults aged 18 to 24 not only consume alcohol in the highest rates, they are also among the largest percentage of problem drinkers. Consistently since 2002, one national study has found that full-time college students (ages 18 to 22) report higher rates of current, binge, and heavy alcohol use when compared to non-enrolled peers. In 2008, binge and heavy use rates for full-time college students were 40.5 and 16.3 percent, respectively, compared to 38.1 and 13.0 percent, respectively, for comparable peers who were part-time or non-enrolled (National Survey on Drug Use and Health, 2008). Related, Vik and colleagues (2000) found that 84.2% of their college student sample reported binge drinking within a ninety-day period. Further, while college binge drinkers in one study represented only 44% of their college population, they accounted for 91% of alcohol consumed in that college setting (Wechsler et al., 1999). Not all college students may be binge drinking, but those that do appear to be drinking in dangerous excess.
Studies suggest that binge drinkers are twenty-five times more likely to have a hangover, miss class, fall behind in school, black out, argue with others, have unprotected or unplanned sex, get physically injured, damage property, get in trouble with the law, or require medical treatment for an alcohol-related overdose (Ullman et al., 1999; Wechsler et al., 1994). Hingston and colleagues (2001) integrated data on students ages 18 to 24 from various sources (e.g., National Highway Traffic Safety Administration, Centers for Disease Control and Prevention, national coroner studies, National Household Survey on Drug Abuse, Harvard College Alcohol Survey, and census/college enrollment data) in 1998 and 2001. During both years more than 500,000 students were unintentionally injured due to drinking and more than 600,000 were hit or assaulted by another intoxicated student (Hingston et al., 2001). Additionally, the researchers found that over 1,700 unintentional alcohol-related deaths occurred in 2001, up six percent from 1998. However, not all students are consuming alcohol in dangerous excess. In fact, some research suggests that drinking patterns differ across majors (Markland et al., 2008; Vansteenkiste et al., 2006; Waring et al., 1984a, 1984b).

**Drinking Differences Across Majors**

Some research suggests that business school students drink alcohol more frequently than students in other majors (Markland et al., 2008; Vansteenkiste et al., 2006; Waring et al., 1984a, 1984b). One University of Dayton research team assessed undergraduate drinking behaviors via surveys from 2004-2008. In 2008, surveys included fourteen questions to assess demographic variables and alcohol use; surveys were randomly distributed to undergraduate classes in February to avoid collecting data when dramatic fluctuations in drinking occur (e.g., spring break). A total of 1,160
undergraduate students reported on their drinking behaviors. The results indicated that undergraduate business majors at the University consumed significantly more alcohol than those students majoring in arts and sciences, education, and engineering. Further, these same group differences in drinking behavior were found to be statistically significant in past years in which the survey was conducted (Markland et al., 2008).

Other studies have revealed similar results. Vansteenkiste and colleagues (2006) compared young adults (ages 18 to 20) majoring in business studies (N=119) and education (N=129). Specifically regarding substance use (other results of this study will be discussed later), it was found that business students in their sample reported significantly more substance abuse (e.g., cigarettes, alcohol, drugs) than did education students. In another study, a comparison of social services students to business students revealed that while 88% of all participants consumed alcohol, the proportion of abstainers was significantly higher among social services students. Social services students also reported wanting education about alcohol whereas business students reported almost no interest in such education (Waring et al., 1984b). Overall, literature suggests that college drinking is problematic and dangerous, that alcohol consumption may differ across majors, and that a variety of factors are associated with college drinking.

Factors Associated with College Drinking Relevant to this Study

A few studies suggest that business students consume alcohol more frequently and in higher amounts than other majors (Markland et al., 2008; Vansteenkiste et al., 2006; Waring et al., 1984a, 1984b). However, there is a lack of research exploring mechanisms that might explain these consumption differences. While studies suggest that anxiety and secondary psychopathy are associated with alcohol use in general, literature
points to the following factors as possible mechanisms explaining why the discussed alcohol consumption differences exist: motives for consuming alcohol, perceived drinking norms for that major, sensation seeking tendencies, and primary psychopathy. All of these variables will be discussed in greater detail in the following sections.

**Drinking Motives**

An individual’s motives for alcohol consumption have been suggested to be predictive of drinking behavior and consequences (Carey & Correia, 1997; Cooper, 1994). Various drinking motives have been proposed by social scientists, but Cooper’s (1994) four drinking motives are comprehensive and empirically validated. Cooper (1994) suggests that individuals consume alcohol for one of four motives—enhancement, coping, conformity, or social. These motives result from the compilation of two dimensions: valence (positive or negative reinforcement) and source (internal or external reward). For example, consuming alcohol for coping motives is characterized by drinking to avoid (i.e., negative reinforcement) negative emotional experiences (i.e., internal), while conformity is characterized by drinking to avoid (i.e., negative reinforcement) social criticism (i.e., external). Enhancement motives are typically characterized by drinking to enhance (i.e., positive reinforcement) positive affect (i.e., internal); these individuals tend to be sensation seeking individuals and report drinking for enjoyment (Ham & Hope, 2003). Lastly, social motives are characterized by drinking to attain (i.e., positive reinforcement) social relationships (i.e., external). All four motives are associated with increased frequency and amount of drinking behavior (Cooper, 1994).
Perceived Norms

Studies suggest that students’ perceptions of peer drinking behaviors are influential in how students consume alcohol themselves (Berkowitz, 2004; Borsari & Carey, 2001; Kandel, 1985; Neighbors, Lee, Lewis, Fossos, & Larimer, 2007; Perkins, 2003; Schultz & Neighbors, 2007). This version of social norms theory suggests that peers influence alcohol use (indirectly and directly) by creating perceived norms for how a social group thinks and acts. Such perceived norms have been found to be uniquely associated with drinking among college students (Neighbors et al., 2007).

Even without social pressure, the desire of individuals to fit in frequently leads them to conform to what they perceive to be norms of the group (Marks, Graham, & Hansen, 1992). College students have been found to be more susceptible to the influence of perceived social-drinking norms than their noncollege peers (Schultz & Neighbors, 2007). Not only do college student abstainers receive significantly less social acceptance than their moderate drinking peers (Trice & Beyer, 1977), students who perceive their drinking attitudes as deviant from the norm feel alienated from both their peers and their university (Perkins, 2002). Further, research suggests that the pressure to conform to others is greatest when there are no other individuals that appear to be deviating from the perceived norm (Asch, 1955; Milgram, 1963).

Some studies suggest consistent discrepancies between perceived and actual norms (Borsari & Carey, 2003). Attribution theory (which maintains that students have limited awareness about actual behaviors/attitudes of peers) is often postulated to account for these discrepancies. As Perkins (2002) suggests, a student observes others drinking heavily and assumes that such extreme alcohol use is typical, resulting in elevated
perceived norms. Overestimations of heavy drinking frequency further increase heavy and/or binge drinking, while conversely, underestimations of abstinence or moderate drinking deters students from healthier behavior choices (Perkins, 2002). In fact, students’ perceived norms of alcohol consumption more strongly predict personal consumption than do actual norms of peers (Perkins, Haines, & Rice, 2005).

**Sensation Seeking**

Sensation seeking tendencies have also been found to be associated with substance use (Cloninger & Sigvardsson, 1988; Grucza et al., 2006). Some studies have found that individuals who use alcohol at younger ages score significantly higher than comparable peers on sensation seeking measures (Von Knorring, Bohman, Von Knorring, & Oreland, 1985; Von Knorring, Von Knorring, Smigan, Lindberg, & Edholm, 1987). Related, longitudinal studies have demonstrated that sensation seeking tendencies are predictive of future alcohol abuse problems (Merline, Jager, & Schulenberg, 2008; Teichman, Barnea, & Rahav, 1989a; Wagner, 2001).

The constructs “sensation seeking” and “novelty seeking” have been shown to be highly correlated, and the terms are often used synonymously (Helmus, Downey, Arfken, Henderson, & Schuster, 2001; McCourt, Gurrera, & Cutter, 1993; Zuckerman, 1988). Two studies by Cloninger suggested that novelty seeking increases the initiation of drinking (i.e., drinking at a younger age) as well as the probabilities of frequent and problem drinking (Cloninger & Sigvardsson, 1988; Cloninger, Sigvardsson, Przybeck, & Svrakic, 1995). In one study, Cloninger and colleagues used data from a national survey to assess how novelty seeking tendencies were related to drinking (ranging on a scale from never drinking to severe drinking). The associations between novelty seeking and
alcohol abuse, alcoholic symptoms, and drinking frequency were all statistically significant for men. In addition, both men and women who reported never drinking scored significantly lower in novelty seeking than those participants who reported ever drinking or having drinking problems (Cloninger et al., 1995).

Of particular importance in this study is the relationship between extroversion and sensation seeking because some research suggests that business students and students of other majors differ significantly on extroversion scales (this research will be further explained in later sections). Sensation seeking has been empirically validated as a component of extraversion (Costa & McCrae, 1992; Costa, McCrae, & Dye, 1991; Eysenck, 1990; Ross, Lutz, & Bailey, 2004; Zuckerman, Eysenck, & Eysenck, 1978). Eysenck (1991) included sensation seeking as a primary trait inherent to extraversion, and Zuckerman and colleagues (1978) reported moderate correlations of sensation seeking and extraversion in American male and female samples. Furthermore, the empirical support for sensation seeking as a component of extraversion resulted in Costa and McCrae (1992) including one facet of extraversion (excitement-seeking) as a facet explicitly intended to measure the sensation seeking construct.

**Anxiety**

While anxiety was not a proposed mediator of the relationship between choice of major and drinking behavior in the current study, the construct of anxiety is relevant concerning its general correlation with alcohol use as well as its relationship to psychopathy, specifically secondary psychopathy. While at first glance the notion that sensation seeking and anxiety are both predictors of alcohol consumption may be somewhat counterintuitive, as will be discussed in more detail with respect to Cloninger’s
model of substance abuse disorders (1987), both may represent separate, but important processes in the etiology of problem drinking patterns. Further, both variables also have demonstrated empirical links with the construct of psychopathy (Coyne & Thomas, 2008; Lykken, 1995).

Research suggests that anxiety is comorbid with substance abuse (American Psychiatric Association, 2000; Roberts, Emsley, Pienaar, & Stein, 1999), is predictive of future alcohol use (Schmidt, Buckner, & Keough, 2007; Sherman, 1992), and is prevalent among chronic users of alcohol and diagnosed alcoholics (American Psychiatric Association, 2000; Kirkcaldy, Siefen, Surall, & Bischoff, 2004). Although research with college populations indicates that elevated levels of drinking do not typically persist into later adulthood for most individuals, Costanzo and colleagues found that psychological profiles characterized by elevated levels of hostility, anxiety, and depressive symptoms demonstrated high rates of binge drinking in later adulthood (Costanzo et al., 2007).

In particular, trait anxiety has been a focus of recent research, with mixed findings. In contrast to the temporary condition of state anxiety, trait anxiety reflects a stable tendency (i.e., a persistent state of anxiety). Previous data suggests that trait anxiety is associated with alcohol use disorders (DeHaas, Calamari, & Bair, 2002; Roberts, Emsley, Pienaar, & Stein, 1999; Welte, 1985; Willinger et al., 2002). In a study conducted by Pullen (1994) with college students, both state and trait anxiety were found to be (among other variables) significantly related to alcohol abuse. Studies with nonstudent samples have found that trait anxiety does not independently predict alcohol use disorders (Schmidt, Buckner, & Keough, 2007; Teichman, Barnea, & Rahav, 1989b).
In addition to the above literature, both sensation seeking and anxiety are key components of two largely accepted categories of alcoholism developed by Cloninger (1987)—Type I and Type II (Cloninger & Sigvardsson, 1988). Type I alcoholism is characterized by anxiety, loss of control, and introversion; in contrast, Type II alcoholism is characterized by confidence, talkativeness, and sensation seeking tendencies (Cloninger & Sigvardsson, 1988). It has been theorized that individuals high in anxiety (or Type I drinkers) consume alcohol to self-medicate, while Type II drinkers consume alcohol for excitement purposes (Cloninger & Sigvardsson, 1988).

Psychopathy

A personality variable incorporating some previously discussed traits (i.e., anxiety and sensation seeking) and that was hypothesized in this study to play a role in the association between alcohol consumption and choice of major is psychopathy. In this section, I will define psychopathy, explain characteristics common to primary and secondary psychopaths, and contrast psychopathy with Antisocial Personality Disorder (ASPD).

The construct of psychopathy. While psychopathy is not a formal diagnosis, it is a well-validated diagnostic category (Harpur, Hart, & Hare, 1994) and is conceptualized as a personality disorder characterized by superficial charm, lack of guilt, insincerity, impersonal relationships, and absence of delusional/irrational thinking (Salekin, Trobst, & Krioukova, 2001). The first comprehensive description of the psychopathic personality was developed in *The Mask of Sanity* by Hervey Cleckley (1941). Cleckley (1941) delineated sixteen criteria of psychopathy which have since been condensed to four
facets: affective (e.g., lack of empathy), interpersonal (e.g., grandiosity), lifestyle (e.g., impulsivity), and antisocial (e.g., delinquency).

Recent literature notes that while psychopathy historically has been studied in criminal populations, Cleckley’s original conceptualization of the construct did not consider criminality as a necessary or central component of the disorder (Benning, Patrick, Blonigen, Hicks, & Iacono, 2005; Salekin et al., 2001). In fact, Coid and Yang (2008) found that 3.6% of their community sample were potential psychopaths, with another 25.6% having psychopathic features. Hall & Benning (2006) suggested that individuals characterized as noncriminal psychopaths may be less extreme versions of their criminal counterparts and that individuals characterized as criminal psychopaths may lack some of the protective features of their noncriminal counterparts. Further, these colleagues suggested that such persons without criminal records may possess predominately personality features of psychopathy with reduced antisocial features, while persons characterized as criminal psychopaths have both.

**Primary versus secondary psychopathy.** Since Karpman’s (1948) initial proposal to differentiate primary and secondary psychopathy, clinical settings and researchers have empirically distinguished between these two types (Coyne & Thomas, 2008; Levenson, Kiehl, & Fitzpatrick, 1995; Lykken, 1995). A diagnostic tool commonly used to assess psychopathy is a clinical rating scale called the Psychopathy Checklist-Revised (PCL-R) developed by Robert Hare (2003). Early factor analysis of the PCL-R (Harpur, Hare, & Hakstian, 1989) indicated that this measure consists of two factors: factor one (interpersonal and affective deficits) and factor two (symptoms of antisocial behavior). In general, individuals characterized as primary psychopaths tend to have
more factor one personality traits (e.g., arrogance, callousness, manipulativeness, lying, low anxiety, high sensation seeking, low guilt and empathy) while individuals characterized as secondary psychopaths tend to have mainly factor two traits (e.g., impulsivity, boredom proneness, irresponsibility, and lack of long-term goals) (Coyne & Thomas, 2008; Lykken, 1995) in addition to showing more empathy, guilt, and anxiety than their primary counterparts (Coyne & Thomas, 2008).

**Psychopathy’s relationship to ASPD and substance abuse.** For this study, it is important to recognize that the DSM-IV-TR definition of ASPD differs from the psychopathy construct. Without knowledge of this difference it could be inaccurately assumed that my hypotheses suggest a link between some students and ASPD. In the DSM-IV-TR, criterion for ASPD focus on behavioral manifestations, while Cleckley’s (1941) definition of psychopathy focuses on personality features. Characteristics of psychopathy such as callousness, selfishness, manipulativeness, lack of empathy, and egocentricity are absent from ASPD criteria (Hare, Hart, & Harpur, 1991). While ASPD and psychopathy are different constructs, research suggests both are related to alcohol use. ASPD is highly comorbid with drug use disorders (Goldstein et al., 2007) and is considered a risk factor for substance use disorders (Mueser et al., 2006). Persons characterized as psychopaths are more likely than others to abuse alcohol (Lewis & Cloninger, 1983) and to have an alcohol abuse/dependence diagnosis (Gacono, 2000).

**Business Student Personality Factors**

Only a few studies examining personality differences among undergraduate majors exist. However, there are certain variables associated with alcohol use that also
appear to be associated with the choice of business as a major: sensation seeking tendencies, drinking for social or enhancement motives, and primary psychopathy.

In 1981, Skinner conducted a study with undergraduate students demonstrating that business students obtained significantly higher Machiavellianism scores than did a matched nonbusiness group. His follow-up study investigated whether the relationship between Machiavellianism (i.e., a personality trait characterized by interpersonally manipulative behavior) and a preference for business occupations was mediated by other personality characteristics (Skinner, 1983). Skinner (1983) found support for his predictions in that, compared to nonbusiness high-Machs (i.e., individuals who score high on Machiavellianism), business high-Machs scored significantly higher in extroversion (as delineated previously, it has been widely researched that sensation seeking is a known component of extroversion). Results of a similar study (Skinner, 1988) indicated that high-Mach undergraduates obtained significantly higher Eysenck Personality Questionnaire (EPQ) psychopathy scores than did low-Mach undergraduates. Skinner (1988) further concluded that Machiavellianism was associated with primary psychopathy more strongly than secondary psychopathy. In sum, Skinner’s studies suggest that business students may differ from other students in that they tend to display higher levels of Machiavellianism (a construct similar to psychopathy) and extroversion.

In a more contemporary study, Tobacyk and Cieslicka (2000a) compared third and fourth year Polish university marketing/management business students to English/humanities students. Students completed the Myers Briggs Personality Type Indicator (MBTI), and differences between the groups were analyzed using I statistic analyses (the I statistic represents a self-selection index that statistically compares results
between groups). The analyses indicated that business majors were more extroverted than introverted, more sensing (i.e., the person’s perception is focused on objectivity and realistic questioning) than intuitive (i.e., the person’s perception tends to be more imaginative), more thinking (i.e., the person’s decisions are driven by objective, nonpersonal principles) than feeling (i.e., the person’s decisions are driven by interpersonal involvement), and more judging (i.e., the person prefers to follow schedules and procedures, and uses effective time management) than perceiving (i.e., the person is flexible, adaptable, and open); humanities majors were found to be more introverted than extroverted, more intuitive than sensing, and more perceiving than judging. Tobacyk and colleagues (2000b) also conducted a study cross-nationally comparing Polish and American students. The researchers first demonstrated convergent validity between Polish business students and American business students as well as between Polish humanities majors and American liberal arts students. The analyses revealed that all business groups (Polish and American) showed statistically significant preferences for extraversion, sensing, thinking, and judging. In contrast, introversion, intuition, and perceiving were statistically significant preferences in the humanities/liberal arts groups. While these two studies lend support to the general idea that business students and other students differ in some personality traits, of particular importance for this study is the further suggestion that business students may display higher rates of extraversion and primary psychopathy traits than other students.

Importance placed on extrinsic values is another identified difference between business and nonbusiness majors and is also a relevant factor in predicting alcohol use. Research suggests that having extrinsic values (i.e., value placed on wealth, fame, and
image instead of on growth, relationships, and community) (Williams, Cox, Hedberg, & Deci, 2000) as well as high levels of extroversion and impulsivity (Corcos et al., 2008) are associated with alcohol and cigarette abuse. In one recent study, Vansteenkiste and colleagues (2006) compared Belgium business and education students using the Aspiration Index, which assesses the importance people place on intrinsic and extrinsic values. The results indicated that business students significantly endorsed extrinsic values more strongly than education students. In addition, the results indicated that education students reported less substance use than business students. Lastly, Vansteenkiste and colleagues (2006) found that business students’ higher levels of substance abuse, compared to education students, was mediated largely by their extrinsic value orientation.

The above research suggests that business students may possess some psychopathic traits that would benefit them in business fields. Many psychopathic traits are attractive in job interviews (e.g., superficial charm, appearance of high intelligence, high energy level, appearance of creativity and ambition), especially for high-level positions (Babiak & Hare, 2006). Research indicates that individuals characterized as psychopaths can often be quite successful in the business world (Babiak & Hare, 2006; Henley, 2001; Salekin et al., 2001), and that such persons who do not possess a criminal record are likely heavily represented in high-powered, prestigious occupations (i.e., doctors, lawyers, corporate executives) (Babiak & Hare, 2006; Henley, 2001; Salekin et al., 2001). Henley’s study (2001) on career interests in a community population of undergraduate students characterized as psychopaths found the following variables to be positively correlated with psychopathy: interest in risky and adventurous work activities, interest in a more independent or solitary work style, and a desire to direct and lead
others on the job. These individuals in Henley’s study gravitated toward independent, hands-on work with things/ideas, occupations involving risky or exciting situations, working with finances and earning wealth, and collecting power and prestige. While I do not intend to suggest that business students display clinically significant levels of psychopathy, the above research suggests that business students may display some beneficial traits of this construct (e.g., sensation seeking, charisma, low anxiety) for their chosen field of work.

As discussed above, some evidence suggests that business students and other students may differ in some personality traits. For example, business students may exhibit higher levels of sensation seeking (a component of extraversion). Further, extraversion is linked to enjoying social situations, which may result in business students choosing to drink alcohol for social motives. Having an extrinsic value orientation (as some research suggests business students do) could be related to drinking alcohol for enhancement motives. Lastly, the above research suggests that another potential difference between business students and others may be that business students tend to have higher levels of psychopathic traits.

**Current Model and Links from Relevant Research**

Research on sensation seeking and anxiety discussed above suggests that students who score higher on measures of either variable are likely to consume alcohol more frequently and in higher amounts than other comparable students. As some studies suggest a link between choice of business as a major and extroversion (sensation seeking is a component of extroversion), it was proposed in the current model that business students would score higher than comparable peers on sensation seeking measures and
would consume alcohol more often and in higher amounts. In other words, business students would tend to display the characteristics of a Type II drinker (sensation seeking and gregarious nature). In addition, it was proposed that business students would consume alcohol primarily for social or enhancement motives largely due to their extroverted tendencies and focus on extrinsic values. Business students may drink to fulfill sensation seeking tendencies (enhancement motives) or acquire social standing (social motives). Further, business students may consume alcohol more frequently and in higher amounts than other students due to the perceived drinking norms within their major (i.e., business students may perceive frequent and high amounts of alcohol consumption as normal for their chosen major, therefore consuming more alcohol themselves).

Regarding psychopathy, it is important to note again that in Cleckley’s first discussion of psychopathy (1941), he considered psychopathy to be common in the general population, noting that criminality was not required in an individual with psychopathic traits. As previously mentioned, some studies suggest that business students score higher than comparable peers on measures of extroversion. Sensation seeking is a component of extroversion and a common trait in primary psychopaths. Related, low levels of anxiety (characteristic of Type II drinkers) are characteristic of primary psychopaths. Further, Skinner (1981, 1983) found that business majors scored higher on Machiavellianism measures than did other students. Since Machiavellianism and psychopathy share many traits (e.g., tendency to manipulate and deceive), some psychologists consider Machiavellianism to essentially be a subclinical form of psychopathy (Goleman, 2006). Undergraduate students characterized as noncriminal
psychopaths have been suggested to prefer occupational characteristics typical of many business professions (e.g., risky, adventurous, working with ideas, working with finances, directing others) (Henley, 2001). Thus, I also proposed that business students would differ from other peers on traits of primary psychopathy but not on secondary psychopathy or anxiety (a core characteristic of secondary psychopathy).

**Hypotheses**

It was proposed in this study that sensation seeking, social and enhancement drinking motives, perceived drinking norms, and primary psychopathy would mediate the relationship between choice of major and drinking behavior. Anxiety and secondary psychopathy were predicted to show direct relationships with drinking behavior, but not to be mediators of the association between choice of major and drinking behavior. Mediation exists when a third variable affects the relationship between two other variables. According to Baron and Kenny (1986), to demonstrate the presence of mediation, the predictor and criterion must be significantly related to each other, and the mediator and predictor must be significantly related to each other. Additionally, when the predictor is statistically controlled, the pre-established relationship between the mediator and the criterion should remain. However, if full mediation is present, when the hypothesized mediator is statistically controlled, the relationship between the predictor and the criterion variables should decrease (Baron & Kenny, 1986). In this study business major served as the predictor variable and drinking behavior was the criterion variable. Five mediators were hypothesized to exist in the current model—sensation seeking tendencies, social and enhancement motives for alcohol consumption, perceived norms of
drinking behavior, and primary psychopathy. Based on the above-described criteria of mediation, the following sets of hypotheses were proposed:

I. Mediators of the relationship between choice of major and drinking behavior (i.e., sensation seeking, social motives, enhancement motives, perceived norms, and primary psychopathy).

1. Business majors would score higher than arts and sciences majors on measures of binge drinking frequency (two-week period), drinking frequency (one-week period), and drinking problems.

2. Group differences in major would exist on the five hypothesized mediator variables such that business majors would score higher on measures of sensation seeking, social motives, enhancement motives, perceived drinking norms for their major, and primary psychopathy in comparison to arts and sciences majors.

3. When statistically controlling for undergraduate major, the relationship between the hypothesized mediators (i.e., sensation seeking, social motives, enhancement motives, perceived drinking norms, and primary psychopathy) and each of the criterion variables (i.e., binge drinking frequency, drinking frequency, and drinking problems) would remain.

4. When statistically controlling for sensation seeking, both motives, perceived drinking norms, and primary psychopathy, the relationship between major and the criterion variables (i.e., binge drinking frequency, drinking frequency, and drinking problems) would decrease.
II. Variables with a direct relationship to drinking behavior (i.e., anxiety and secondary psychopathy), but that would not serve as mediating variables.

5. There would be no difference between majors on measures of anxiety or secondary psychopathy.

6. Anxiety and secondary psychopathy would be related to increased binge drinking frequency, drinking frequency, and drinking problems regardless of undergraduate major.
CHAPTER II

METHOD

Participants

A total of 169 participants (Males = 46%, Females = 54%) were recruited from the Introduction to Psychology subject pool at the University of Dayton and from a co-ed business fraternity on campus. The fraternity used for recruitment in the current study is a national business fraternity in which members are selected based on their academic merit (i.e., members must have both a cumulative grade point average of 3.0 and either rank in the top 35% of their class or have at least a 3.25 grade point average in their specific major). Students must either major in, have a concentration in, or state an interest in accounting, finance, or information systems in order to obtain membership in the club. Once an individual becomes a member, his/her standing in the fraternity is based on academics, community service, and participation in professional activities.

A power analysis conducted using the formula and criterion outlined by Green (1991) indicated that 170 participants would be needed to obtain 80% power for detecting a medium sized effect at the traditional .05 criterion of statistical significance (all other power analyses reported in this study used this criteria).

Participants volunteered in exchange for course credit (subject pool) or for one service hour credit (business fraternity). The average age of participants was 19 years
(SD = 1.16), with a range from 18 to 23 years of age. The average age of participants in the College of Arts and Sciences was 19 years (SD = .86), and the average age of participants in the School of Business Administrations was 20 years (SD = 1.27). The majority of participants were Caucasian (92%); 3% were African American; 3% were Asian; 1% were Latino; and 1% were from other ethnic groups. Approximately half of the participants were from the College of Arts and Science (49%) and half were from the School of Business (51%). All participants completed the demographic measure found in Appendix A.

**Measures**

**University of Dayton 2007 Campus Alcohol Survey**

The University of Dayton 2007 Campus Alcohol Survey is a measure that was created by the University of Dayton for the purpose of collecting demographic data in addition to student experiences with alcohol. The items in this measure were derived from other alcohol measures such as The CORE Drug and Alcohol Survey and institutional surveys from Kansas, Kent State, and Ohio State. The CORE Drug and Alcohol Survey was developed in the late 1980s by the U.S. Department of Education and advisors from several universities. The survey is frequently used by universities and colleges to determine the degree of substance use/abuse on their campuses. The Campus Alcohol Survey was used by Markland and associates (2008) in the most recent university report exploring drinking discrepancies between college majors and is being used in the current study to be analogous to previous data. While Markland’s original measure consists of 14 items, only 7 items were used in the current study to assess the respondent’s recent experiences with alcohol. The second and third items in this measure
were used to create the variable binge drinking frequency. Males answered item two, while females answered item three as the definition of binge drinking varies by gender (e.g., five or more drinks in one sitting for males, four or more drinks in one sitting for females). Respondents answered this item concerning how frequently they had engaged in binge drinking in the last two weeks in multiple choice format, with responses ranging from “never” to “7 or more times.” Item four of this measure was used to create the drinking frequency variable. Respondents indicated in numerical form the number of drinks they consumed each day of the past week. The fifth item represented the drinking problems variable. Respondents were asked to consider the number of times they had experienced common problems associated with alcohol (e.g., hangover, missing class, damaging property, injuries, unwanted sexual contact) in the past month. Responses ranged from 0 to 5 (“never” to “five or more times”). Items six and seven were not used in primary analyses, but were included for potential follow-up analyses. Item six measured how often respondents utilized safety precautions while drinking alcohol (e.g., using a designated driver), and responses were endorsed on a 4-point scale ranging from “never” to “always.” Item seven measured how often respondents engaged in other alcohol-related behaviors (e.g., refusing alcohol, purchasing alcohol for others under 21 years of age, used a fake ID), and items were endorsed on a 6-point scale ranging from “never” to “five or more.” Cronbach’s alpha for this measure in the current study was .65. This measure can be found in Appendix B.

**Levenson’s Self-Report Psychopathy Scale (LSRP)**

In the current study, the Levenson Self-Report Psychopathy Scale was used to examine psychopathic traits (Levenson, Kiehl, & Fitzpatrick, 1995; LSRP). The LSRP is
a self-report measure that reflects the content of Hare’s Psychopathy Checklist-Revised (PCL-R) and consists of 26 items. Items on the LSRP are endorsed on a 4-point Likert scale ranging from “disagree strongly” to “agree strongly.” The LSRP also includes reverse score items to control for response sets and has a two-factor approach designed to measure both primary and secondary psychopathy. The primary scale consists of 16 items (e.g., “I often admire a really clever scam”) and assesses the interpersonal and affective features of psychopathy, (e.g., selfish, uncaring, manipulative posture towards others). The secondary scale of 10 items (e.g., “I find myself in the same kinds of trouble, time after time”) is designed to assess self-defeating lifestyle and impulsivity (Falkenbach, Poythress, Falki, & Manchak, 2007; Levenson, Kiehl, & Fitzpatrick, 1995). Total scores on the LSRP range from 26 to 104, with primary psychopathy subscale scores ranging from 16 to 64 and secondary psychopathy subscale scores ranging from 10 to 40. In the present study, primary analyses were based on the subscale scores rather than on total score.

Levenson and colleagues (1995) found a positive correlation ($r = .40$) between the primary and secondary scales of the LSRP, and more recent studies have confirmed this finding, with $r$ values ranging from .21 (Ross & Rausch, 2001) to .59 (Falkenbach et al., 2007; McHoskey, Worzel, & Szyarto, 1998). The LSRP demonstrates acceptable convergent validity with Hare’s Self-Report Psychopathy Scale (HSRP), with an overall $r$ value of .64, a primary psychopathy subscale $r$ value of .66, and a secondary psychopathy subscale $r$ value of .42. Cronbach’s alpha values for the LSRP are also high (total $\alpha = .82$, primary psychopathy $\alpha = .83$, secondary psychopathy $\alpha = .71$) (Levenson et al., 1995). When compared between a period of eight weeks, test-retest reliability was found
to be $r = .83$ (Lynam, Whiteside, & Jones, 1999). Cronbach’s alpha for this measure in the current study was .69 for the secondary scale and .80 for the primary scale. The LSRP can be found in Appendix C.

**The State-Trait Anxiety Inventory (STAI)**

The State-Trait Anxiety Inventory (STAI), developed by Spielberger and associates (Spielberger, Gorsuch, & Lushene, 1970), was used in the current study to measure trait anxiety. Written at a fifth-to-sixth grade reading level, the total scale consists of 40 items, with the first 20 items providing an index of state anxiety (A-State) and the second 20 items providing an index of trait anxiety (A-Trait) (Hedberg, 1972). Only A-Trait items were used in the present study. Throughout the 20 items (e.g., “I feel nervous and restless”), respondents check one of four statements describing how they generally feel (Woody, 1980), and responses are recorded on a four-point rating scale (Hedberg, 1972). Responses range from 1 (Almost Never) to 4 (Almost Always) (Spielberger et al., 1970). Nine items are stated in reverse to diminish acquiescence tendencies.

The A-Trait scale of the STAI has empirically demonstrated a high degree of internal consistency. As measured by the K-R (20) formula, the A-Trait scale has coefficients ranging from .86 to .92 (Gaudry, 1975). Test-retest coefficients for the A-State scale range from .16 to .54 (for a retest period of 104 days) whereas coefficients range from .73 to .86 (for a retest period of 20 days) for the A-Trait scale (Spielberger et al., 1970). As suggested by Gaudry (1975), this data is consistent with the design of the two scales. The fact that A-State items consistently vary with different experimental states of stress while A-Trait items do not, demonstrates the construct validity of the
measure. Additionally, concurrent validity with other A-Trait measures (e.g., Manifest Anxiety Scale and Institute of Personality and Ability Testing Anxiety Scale) yield correlations ranging from .75 and .85 for college students and psychiatric patients. Considerable evidence (Spielberger et al., 1970; Woody, 1980) indicates that the STAI is a useful clinical as well as research tool. In the current study, Cronbach’s alpha for the STAI was .89. The STAI can be found in Appendix D.

**Social Desirability Scale**

The Balanced Inventory of Desirable Responding (BIDR) measures two commonly accepted components of social desirability: self-deceptive enhancement and impression management (Paulhus, 1984). Self-deceptive enhancement (SDE) refers to an unconscious positive bias in item responses with the aim of protecting positive self-esteem (Stober, Dette, & Musch, 2002) and represents perceived desirability (Peebles & Moore, 1998). In contrast, impression management (IM) refers to the conscious dissimulation of item responses with the aim of making a favorable impression on others (Stober et al., 2002) and represents defensiveness (Peebles & Moore, 1998). The BIDR contains 40 items worded as statements. Twenty of these items capture SDE (e.g., “I always know why I like things”), and twenty items capture IM (e.g., “When I hear people talking privately, I avoid listening”). BIDR items are presented using a 7-point Likert answer scale ranging from 1 (not true) to 7 (very true) (Paulhus, 1984). In scoring this measure, negatively keyed items are reversed, and 1 point is awarded for each “6” or “7” answer on both SDE and IM items (Stober et al., 2002). Responses ranging from “1” to “5” are all scored as “0” and points are summed across all items to form subscale scores. Thus, an overall measure of socially desirable responding can be determined by summing
SDE and IM subscale scores. Scores for each subscale can range from 0 to 20, and the full measure range is from 0 to 40 (Peterson et al., 2003).

The BIDR has a high degree of internal consistency (Cronbach’s alpha = .83) as well as satisfactory test-retest reliability (.65 to .69) (Paulhus, 1991). Internal consistency values range from .68 to .80 for the SDE scale and from .75 to .86 for the IM scale. Over the course of a five-week interval, test-retest reliability of the BIDR was .69 for the SDE scale and .65 for the IM scale (Peebles & Moore, 1998). In addition, low to moderate correlations ($r = 0.05$ to $0.40$) have been found between the two subscales of the BIDR (Reid-Seiser & Fritzschke, 2001). Finally, the Marlowe-Crowne scale and the Multidimensional Social Desirability Inventory have been used to assess concurrent validity; correlations between the BIDR and these measures were .80 and .71 respectively (Paulhus, 1991). In the current study, the SDE and IM subscales were used separately, and Cronbach’s alpha was .60 for the SDE subscale and .64 for the IM subscale. The BIDR can be found in Appendix E.

**Arnett Inventory of Sensation Seeking**

The Arnett Inventory of Sensation Seeking (AISS) is a measure of sensation seeking that emphasizes novelty and intensity as two central components of sensation seeking. The AISS is a self-report measure consisting of 20 items broken into two subscales (Novelty and Intensity). Ten of these items capture the Novelty subscale (e.g., “I think it’s fun and exciting to perform or speak in front of a group”), and ten items capture the Intensity subscale (e.g., “When I listen to music I like it to be loud”). AISS items are presented using a 4-point Likert-type answer scale ranging from 1 (describes me very well) to 4 (does not describe me at all) (Arnett, 1994). In scoring this measure,
negatively keyed items are reversed, and respondents receive total scores ranging from 20 to 80, with higher total scores indicating higher levels of sensation seeking. For the present study, total scores were used for primary analyses.

Until relatively recently, the most common measure used to assess sensation seeking has been the Sensation Seeking Scale (SSS), Form V developed by Zuckerman and colleagues (1978). While numerous limitations of this measure exist, the most relevant limitation to the current study is the presence of confounding factors in this measure (e.g., items on alcohol/drug use, sexual behavior) (Arnett, 1994). The AISS developed by Arnett (1994) sought to address the limitations of past sensation seeking measures, exclude items intrinsically age-related (e.g., stamina, physical strength), and avoid presupposing that sensation seeking tendencies have to be expressed in norm-breaking or antisocial ways.

Two studies conducted by Arnett (1994) support the reliability and validity of the AISS measure. In the first study, Arnett (1994) compared the AISS to the SSS using 116 adolescents from a public high school. Results indicated that for every item, the AISS was correlated more strongly with risk behavior than the SSS. Correlation between the AISS and the SSS was only .41 for total scale and ranged from .08 to .47 for subscales. This study also demonstrated a correlation between the two subscales equal to .41 and an internal reliability total value of .70 (internal reliability of .64 and .50 for Intensity and Novelty subscales, respectively). Other research comparing the AISS to the SSS has found comparable results. Haynes and associates conducted confirmatory factor analysis using both the AISS and SSS, concluding that the more modified and shortened AISS
provided a more appropriate measure of sensation seeking when compared to the SSS (Haynes, Miles, & Clements, 2000).

In his second study, Arnett (1994) used the AISS in addition to the Aggression subscale of the California Psychological Inventory (CPI) to examine the construct validity of the AISS. Adolescents and parents were participants in this study. Results indicated that the AISS was again correlated with a variety of risk behaviors. For adolescents, but not for adults, sensation seeking was significantly correlated with Aggression as measured by the CPI. Cronbach’s alpha for the AISS in the current study was .70. The AISS can be found in Appendix F.

Drinking Motives Measure

The Drinking Motives Measure (DMM) created by Cooper (1994), is a 20-item measure designed to assess the drinking motives of respondents in four categories (social, enhancement, coping, conformity). Each subscale contains five items, and response options are scored on a six-point Likert scale that ranges from 1 (never) to 6 (always). Participant responses are averaged to create a score for each separate subscale. Subscale scores (after averaging) range from 1 to 6.

Prior to this four-factor model, Cooper’s three-factor model of drinking motives was often used. However, recent analyses indicate that the four motives described constitute empirically distinct factors that are associated with unique drinking patterns and consequences. In one study, Cooper (1994) compared two single factor models, a two-factor model, a three-factor model, and the four-factor DDM. Using the EQS structural equation modeling program, results indicated that the four-factor model fit the study data significantly better than all other models. Furthermore, values for fit to the
data for the four-factor model were particularly high (NFI = .93, CFI = .90). This study also demonstrated that the drinking motives scales were adequately reliable, not highly correlated (with exception of social and enhancement motives), with factor patterns invariant across gender, age, and race.

Other research has found comparable results. Using a college student population, Martens and colleagues (2008) found that the four-factor DMM provided an acceptable fit (CFI = .92, IFI = .92) to the data and fit significantly better than alternative nested models (Martens, Rocha, Martin, & Serrao, 2008). Internal consistency values ranged from .81 to .87 for the four subscales. In general, the Martens and colleagues study provided further evidence in support of the reliability and validity of DDM scores. For the purpose of the current study, scores for the social and enhancement subscales were used in primary analyses. In the current study, Cronbach’s alpha for the DDM ranged from .86 (enhancement motives) to .91 (social motives), and this measure can be found in Appendix G.

**Drinking Norms Rating Form**

The Drinking Norms Rating Form (DNRF) is a measure designed to assess an individual’s estimates of peer drinking (Baer, Stacy, & Larimer, 1991). The original DNRF asks respondents to estimate the number of drinks their “immediate group of close friends” consumed daily for an average week during the past month. For the current study, “peers in your same major” was substituted for “immediate group of close friends.” Specific reference groups instead of general reference groups (e.g., average student) are used because self–other discrepancies tend to be less inflated this way (Borsari & Carey, 2003). The DNRF consists of five items asking respondents to estimate...
the drinking behaviors of others over the past three months. The first item asks respondents to estimate in numerical form how much alcohol, on average, a typical member of the indicated peer group drinks each day of a week. Item two asks respondents to estimate how often a typical member of the indicated peer group consumes alcohol by choosing one of twelve responses ranging from “Never” to “Every day.” For the third item, respondents indicate from “0 drinks” to “25 or more drinks” how much they believe a typical member of the indicated peer group drinks on a given occasion. Item four requests that respondents estimate the percentage of members of the indicated peer group that: never drink, drink once a month or less, and never drink more than two drinks in one setting. Lastly, respondents indicate on a Likert scale from 1 (not confident at all) to 7 (absolutely confident) how confident they are about their estimates of other peers drinking habits. Each of the five items on the DNRF is scored separately.

Previous studies assessing college student perceptions of alcohol use have used the DNRF, suggesting face validity and predictive utility (Baer et al., 1991; Kypri & Langley, 2003; Larimer, Irvine, Kilmer, & Marlatt, 1997). The test–retest reliability of the DNRF in one study was .69 (Broadwater, Curtin, Martz, & Zrull, 2006). For the purposed of the current study, the DNRF was used twice, once to assess perceptions of the University as a whole and once to assess perceptions of participant’s chosen major at the University. Cronbach’s alpha for the first three items (the fourth and fifth items were omitted from this analysis because they assess different constructs from the first three) in the current study ranged from .39 (for university) to .37 (for major). These two versions of the DNRF can be found in Appendices H and I.
Procedure

Participants recruited from the University subject pool received one course research credit for participation, while participants recruited from the business fraternity received one credit toward their club’s service hour requirement. Participants completed surveys assessing the following: alcohol consumption (i.e., binge drinking frequency, frequency of drinking, and drinking problems) (Alcohol Survey), trait anxiety (STAI), sensation seeking tendencies (AISS), psychopathy (LSRP), social desirability (BIDR), perception of other’s drinking habits (DNRF), and professed motives behind their alcohol consumption (DMM). The measures were administered via a packet that included the demographic data sheet first. The order of the remaining measures was randomized utilizing a random starting order with a rotation procedure (e.g., CBA, BAC, ACB). Upon completion of all measures in the packet, participants were thanked and debriefed.
Preliminary Analyses

Data screening was conducted for univariate outliers on all three dependent variables (e.g., binge drinking frequency, drinking frequency, and drinking problems). Cases with standardized scores greater than 3.29 ($p < .001$) were removed. According to this criterion, two participants were deleted from the data set (one participant exceeded criterion on the drinking frequency measure, and one participant exceeded criterion on the drinking problems measure). The mean substitution method was used for all variables to address any missing data in the current study.

The percentages and frequencies for the nominal and ordinal variables for this study are summarized in Table 1. Table 2 summarizes the means, standard deviations, and ranges of the continuous variables for the current study; the data is reported for the total sample, the sample of arts and sciences students, and the sample of business students. Preliminary analyses were carried out to determine the relation between demographic variables and the primary criterion variables (i.e., binge drinking frequency, drinking frequency, and drinking problems). Zero-order correlations were conducted for the continuous variables. The results indicated that the IM scale (i.e., impression management) of social desirability was negatively correlated with binge drinking.
Table 1

*Descriptive Statistics for Nominal and Ordinal Level Study Measures*

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</table>
frequency ($r = -.23, p < .01$), drinking frequency ($r = -.17, p < .05$), and drinking problems ($r = -.29, p < .01$). That is, participants who scored high in impression management tendencies were more likely than participants who scored low in impression management tendencies to score low on binge drinking frequency, drinking frequency, and drinking problems. The results further indicated that the SDE (i.e., self-deceptive enhancement) scale of social desirability was negatively correlated with drinking problems ($r = -.17, p < .05$). Participants who scored high in self-deceptive enhancement tendencies were more likely than participants who scored low in self-deceptive enhancement tendencies to score low on drinking problems. Participants’ age was not significantly related to any of the three criterion variables. Thus, the social desirability SDE scale was statistically controlled for in any analyses involving the three criterion variables, and the social desirability IM scale was statistically controlled for in any analyses involving the criterion variable drinking problems.

Possible group differences in ethnicity on the three criterion variables were analyzed using a multivariate analysis of variance (MANOVA). The results revealed no significant differences between participants’ ethnicity and the three drinking variables. Finally, three independent samples t-tests were computed to assess for possible gender differences on the three criterion variables. The results revealed significant gender differences in binge drinking frequency ($t = 3.83, p < .001$), drinking frequency ($t = 6.27, p < .001$), and drinking problems ($t = 2.84, p < .01$). Men scored higher than women in binge drinking frequency ($M = 7.45, SD = 4.02$ vs. $M = 5.13, SD = 3.86$), drinking frequency ($M = 21.05, SD = 15.77$ vs. $M = 8.92, SD = 8.66$), and drinking problems ($M = 4.77, SD = 3.83$ vs. $M = 3.21, SD = 3.25$).
Zero-order correlations were calculated between the hypothesized mediators (i.e., sensation seeking, social motives, enhancement motives, perceived norms, and primary psychopathy), trait anxiety, and secondary psychopathy. These results are summarized in Table 3. Sensation seeking was significantly positively related with the enhancement motives measure ($r = .18, p < .05$), primary psychopathy ($r = .20, p < .05$), and secondary psychopathy ($r = .21, p < .01$). In other words, participants who scored high on sensation seeking tendencies were more likely than participants who scored low on sensation seeking tendencies to score high on the enhancement motives measure, primary psychopathy, and secondary psychopathy. Further, the social motives measure was significantly positively related with primary psychopathy ($r = .17, p < .05$) such that participants who scored high on the social motives measure were more likely than participants who scored low on the social motives measure to score high on primary psychopathy. The enhancement motives measure was significantly positively related with primary psychopathy ($r = .22, p < .01$) and secondary psychopathy ($r = .22, p < .01$). Individuals who scored high on the enhancement motives measure were more likely than those who scored low on the enhancement motives measure to score high on both primary and secondary psychopathy. Primary psychopathy was significantly positively related with secondary psychopathy ($r = .40, p < .01$), and secondary psychopathy was significantly positively related with trait anxiety ($r = .44, p < .01$). Participants who scored high on primary psychopathy were more likely than those who scored low on...
<table>
<thead>
<tr>
<th>Variable</th>
<th>Sensation Seeking</th>
<th>Social Motives</th>
<th>Enhancement Motives</th>
<th>Primary Psychopathy</th>
<th>Secondary Psychopathy</th>
<th>Trait Anxiety</th>
<th>UDW</th>
<th>UTW</th>
<th>UDO</th>
<th>MDW</th>
<th>MTW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social Motives</td>
<td>.15</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Enhancement Motives</td>
<td>.18*</td>
<td>.79**</td>
<td></td>
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<td></td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>Primary Psychopathy</td>
<td>.20*</td>
<td>.17*</td>
<td>.22**</td>
<td></td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>Secondary Psychopathy</td>
<td>.21**</td>
<td>.12</td>
<td>.22**</td>
<td>.40**</td>
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<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Trait Anxiety</td>
<td>-.04</td>
<td>-.01</td>
<td>-.04</td>
<td>-.03</td>
<td>.44**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>UDW</td>
<td>.17*</td>
<td>.22**</td>
<td>.30**</td>
<td>.29**</td>
<td>.28**</td>
<td>.13</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>UTW</td>
<td>-.08</td>
<td>-.14</td>
<td>-.13</td>
<td>.09</td>
<td>.04</td>
<td>.03</td>
<td>.27**</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>UDO</td>
<td>.17*</td>
<td>.25**</td>
<td>.25**</td>
<td>.19*</td>
<td>.17*</td>
<td>.05</td>
<td>.65**</td>
<td>.24**</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>MDW</td>
<td>.10</td>
<td>.32**</td>
<td>.46**</td>
<td>.40**</td>
<td>.32**</td>
<td>-.01</td>
<td>.62**</td>
<td>.06</td>
<td>.48**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MTW</td>
<td>-.13</td>
<td>.05</td>
<td>.04</td>
<td>.09</td>
<td>.03</td>
<td>-.03</td>
<td>.02</td>
<td>.54**</td>
<td>-.01</td>
<td>.20*</td>
<td></td>
</tr>
<tr>
<td>MDO</td>
<td>.11</td>
<td>.33**</td>
<td>.35**</td>
<td>.16*</td>
<td>.16*</td>
<td>.00</td>
<td>.49**</td>
<td>.07</td>
<td>.71**</td>
<td>.65**</td>
<td>.11</td>
</tr>
</tbody>
</table>

Note: UDW = perceived norm for amount that all university students drink per week; UTW = perceived norm for times that all university students drink per week; UDO = perceived norm for amount that all university students drink per occasion; MDW = perceived norm for amount that students of the same major drink per week; MTW = perceived norm for times that students of the same major drink per week; MDO = perceived norm for amount that students of the same major drink per occasion.

*p < .05.  **p < .01.
primary psychopathy to score high on secondary psychopathy, and participants who scored high on secondary psychopathy were more likely than those who scored low on secondary psychopathy to score high on trait anxiety.

**Relationship Between Major and Gender**

A Chi-Square test of goodness-of-fit was performed to examine the relationship between major (i.e., business, arts and sciences) and gender. The results indicated that gender was equally distributed across major, $\chi^2 (1, N = 170) = 1.95, p > .05$. That is, men and women were not unequally distributed across the two majors (i.e., business, arts and sciences).

**Primary Analyses**

**Hypothesis 1: Business Majors Would Score Higher Than Arts and Sciences Majors on Measures of Binge Drinking Frequency, Drinking Frequency, and Drinking Problems**

To test Hypothesis 1, a multivariate analysis of covariance (MANCOVA) was conducted. In this MANCOVA, major (i.e., business, arts and sciences) served as the grouping variable and the three drinking variables (i.e., binge drinking frequency, drinking frequency, and drinking problems) were used as dependent variables. The two social desirability variables were used as covariates in the analysis (see Table 4 for these results). The results indicated that there was not a significant main effect, $F(3, 154) = 1.48, p > .05$, partial $\eta^2 = .03$, observed power = .39, for major. Technically, since the omnibus $F$ of the main effect for major was not significant, I should not have proceeded with any further analyses. However, I made the decision to continue the analyses not only for learning purposes, but also to explore potential directions for future
Table 4

*Multivariate Analysis of Covariance Between Major and All Three Criterion Variables (i.e., Binge Drinking Frequency, Drinking Frequency, and Drinking Problems)*

<table>
<thead>
<tr>
<th>Variable</th>
<th>MANCOVA F(3, 154)</th>
<th>Binge Drinking Frequency</th>
<th>Drinking Frequency</th>
<th>Drinking Problems</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social Desirability (SDE)</td>
<td>1.81</td>
<td>.00</td>
<td>1.09</td>
<td>.83</td>
</tr>
<tr>
<td>Social Desirability (IM)</td>
<td>3.84**</td>
<td>8.12**</td>
<td>7.12**</td>
<td>10.26***</td>
</tr>
<tr>
<td>Major</td>
<td>1.48</td>
<td>4.22*</td>
<td>1.71</td>
<td>.74</td>
</tr>
</tbody>
</table>

*p < .05.  **p < .01.  ***p < .001.
research. As a result, the remainder of the Results and Discussion sections should be interpreted with caution. In other words, the remainder of this thesis should be read with the knowledge that the initial omnibus $F$ of the main effect for major was not significant and the following analyses, if I were being statistically accurate, should not have been conducted.

With the previous information in mind, the univariate results (i.e., individual ANCOVA analyses) revealed that the two majors significantly differed in binge drinking frequency, $F(1, 159) = 4.22, p < .05$, such that business students scored higher ($M = 6.69, SD = 3.90$) than arts and sciences students ($M = 5.54, SD = 4.27$) on measures of binge drinking frequency. Contrary to expectations, business students and arts and sciences students did not significantly differ on drinking frequency, $F(1, 159) = 1.71, p > .05$, partial $\eta^2 = .01$, observed power = .25, or drinking problems, $F(1, 159) = .74, p > .05$, partial $\eta^2 = .01$, observed power = .14.

Hypotheses 2 and 5: Group Differences in Major Would Exist Such That Business Majors Would Score Higher on Measures for the Five Hypothesized Mediators, and There Would Be No Difference Between Majors on Measures of Anxiety or Secondary Psychopathy

To test Hypotheses 2 and 5, another MANCOVA was conducted. Major was used as the grouping variable and the five mediators (i.e., sensation seeking, social motives, enhancement motives, primary psychopathy, and perceived norms), trait anxiety, and secondary psychopathy were all used as dependent variables. The two social desirability variables were used as covariates in this analysis. These results can be found in Table 5.
Table 5

Multivariate Analysis of Covariance Between Major, Proposed Mediators (i.e., Sensation Seeking, Social Motives, Enhancement Motives, Primary Psychopathy, and Perceived Norms), Secondary Psychopathy, and Trait Anxiety

<table>
<thead>
<tr>
<th>Variable</th>
<th>MANCOVA F(12, 139)</th>
<th>SS</th>
<th>SM</th>
<th>EM</th>
<th>PP</th>
<th>MDW</th>
<th>MTW</th>
<th>MDO</th>
<th>UDW</th>
<th>UTW</th>
<th>UDO</th>
<th>SP</th>
<th>TA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social Desirability (SDE)</td>
<td>5.69***</td>
<td>11.66***</td>
<td>.00</td>
<td>.00</td>
<td>3.43</td>
<td>1.14</td>
<td>.05</td>
<td>3.13</td>
<td>.02</td>
<td>1.08</td>
<td>2.29</td>
<td>6.21**</td>
<td>41.15**</td>
</tr>
<tr>
<td>Social Desirability (IM)</td>
<td>4.84***</td>
<td>18.91***</td>
<td>11.71***</td>
<td>13.35***</td>
<td>28.00***</td>
<td>8.52**</td>
<td>2.83</td>
<td>8.45**</td>
<td>7.72**</td>
<td>.08</td>
<td>6.97**</td>
<td>5.04*</td>
<td>.76</td>
</tr>
<tr>
<td>Major</td>
<td>2.36**</td>
<td>7.19**</td>
<td>1.41</td>
<td>1.39</td>
<td>.46</td>
<td>9.02***</td>
<td>.41</td>
<td>2.98</td>
<td>.08</td>
<td>.27</td>
<td>.68</td>
<td>.01</td>
<td>.22</td>
</tr>
</tbody>
</table>

Note. SS = sensation seeking; SM = social motives; EM = enhancement motives; PP = primary psychopathy; MDW = perceived norm for amount that students of the same major drink per week; MTW = perceived norm for times that students of the same major drink per week; MDO = perceived norm for amount that students of the same major drink per occasion; UDW = perceived norm for amount that all university students drink per week; UTW = perceived norm for times that all university students drink per week; UDO = perceived norm for amount that all university students drink per occasion; SP = secondary psychopathy; TA = trait anxiety.

*p < .05  **p < .01  ***p < .001.
In this analysis, the main effect for major was significant, $F(12, 139) = 2.36, p < .01$, partial $\eta^2 = .17$, observed power = .95. Further, the univariate results (i.e., individual ANCOVA analyses) revealed that the two majors significantly differed in sensation seeking tendencies, $F(1, 154) = 7.19, p < .01$, and perceived norm for amount that students in the same major drink per week, $F(1, 154) = 9.02, p < .001$. Arts and sciences students scored higher on sensation seeking tendencies ($M = 35.00, SD = 7.41$) than business students ($M = 32.37, SD = 7.64$). Business students had higher estimates for the amount of drinks peers in their major consumed per week ($M = 24.21, SD = 10.61$) than did arts and sciences students ($M = 19.18, SD = 10.14$). The observed power for the nonsignificant variables which were hypothesized to be significant was as follows: social motives (.22), enhancement motives (.22), primary psychopathy (.10), perceived norm for amount that students of the same major drink per occasion (.40), perceived norm for number of times students of the same major drink per week (.10), perceived norm for amount that university students drink per occasion (.13), perceived norm for number of times university students drink per week (.08), perceived norm for amount that university students drink per week (.06). As predicted for Hypothesis 5, these results also revealed no significant group differences in major on secondary psychopathy or trait anxiety.

**Hypotheses 3 and 4: When Statistically Controlling for Major, the Relationship Between the Hypothesized Mediators and Each of the Criterion Variables Would Remain; When Statistically Controlling for the Proposed Mediators, the Relationship Between Major and the Criterion Variables Would Decrease**

Hypotheses 3 and 4 were tested using a two-step hierarchical regression (see Table 6 for these results) with binge drinking frequency as the criterion variable (drinking
Table 6

*Hierarchical Multiple Regression Analyses with Simultaneous Entry Predicting Binge Drinking Frequency From Sensation Seeking, Perceived Norm for Amount That Students of the Same Major Drink Per Week, and Major*

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE B</th>
<th>β</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social Desirability SDE</td>
<td>-.09</td>
<td>.11</td>
<td>-.07</td>
<td>-.85</td>
<td>.40</td>
</tr>
<tr>
<td><strong>Step 2</strong></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social Desirability SDE</td>
<td>-.16</td>
<td>.09</td>
<td>-.12</td>
<td>-1.83</td>
<td>.07</td>
</tr>
<tr>
<td>Sensation Seeking</td>
<td>.07</td>
<td>.04</td>
<td>.12</td>
<td>1.86</td>
<td>.07</td>
</tr>
<tr>
<td>MDW</td>
<td>.22</td>
<td>.03</td>
<td>.59</td>
<td>8.96</td>
<td>.00</td>
</tr>
<tr>
<td>Major (i.e., business, arts and sciences)</td>
<td>.15</td>
<td>.56</td>
<td>.02</td>
<td>.27</td>
<td>.80</td>
</tr>
</tbody>
</table>

*Note.* $R^2 = .005, p = .399, ΔR^2 = .005$ for Step 1; $R^2 = .385, p = .000, ΔR^2 = .380$ for Step 2. MDW = perceived norm for amount that students of the same major drink per week.
frequency and drinking problems were not included due to previous results suggesting that business students and arts and sciences students did not significantly differ on these variables). The first step of the equation consisted of the SDE social desirability scale, and the second step consisted of major and the two variables found to support Hypothesis 2 (i.e., sensation seeking, perceived norm for amount that students of the same major drink per week). The results revealed a significant $R^2$ change value ($R^2 \Delta = .38, p < .001$) and an adjusted $R^2$ value of $.37, F(4, 154) = 24.06, p < .001$, observed power = 1.0, on the second step. This suggests that 37% of the variance in binge drinking frequency could be predicted on the basis of all four variables in the model, which is considered to be a medium effect size. The results further indicated that the variable of perceived norms was a significant predictor ($\beta = .59, p < .001$) of binge drinking frequency. In contrast, sensation seeking was not a significant predictor of binge drinking frequency ($\beta = .12, p > .05$). The beta weight for major was not significant ($\beta = .02, p > .05$), indicating that full mediation existed for perceived norms. In order to determine the significance of the indirect effect of major through the mediator (i.e., perceived norms), a Sobel test for mediation was conducted. The results indicated that perceived norms significantly mediated ($z = 2.91, p < .01$) the relationship between choice of major and binge drinking frequency. Taken together, the results for Hypotheses 1 through 4 (which were designed to follow Baron and Kenny’s steps for mediation) indicated that perceived norm for amount that students of the same major drink per week fully mediated the relationship between choice of major and binge drinking frequency.
Hypothesis 6: Anxiety and Secondary Psychopathy Would be Related to Increased Binge Drinking Frequency, Drinking Frequency, and Drinking Problems Regardless of Major

Hypothesis 6 was tested by computing a correlation matrix between anxiety, secondary psychopathy, and all three drinking variables (i.e., binge drinking frequency, drinking frequency, and drinking problems). Secondary psychopathy was significantly positively related to all three drinking variables. That is, participants who scored high in secondary psychopathy were more likely than participants who scored low in secondary psychopathy to binge drink, drink frequently, and have drinking problems. Contrary to predictions, trait anxiety was not significantly related to any of the three criterion variables. The observed power for the variable of trait anxiety was .00 for both binge drinking frequency and drinking frequency and .31 for drinking problems. These results can be found in Table 7.
Table 7
Zero-Order Correlations Between Anxiety, Secondary Psychopathy, Binge Drinking Frequency, Drinking Frequency, and Drinking Problems

<table>
<thead>
<tr>
<th>Variable</th>
<th>Binge Drinking Frequency</th>
<th>Drinking Frequency</th>
<th>Drinking Problems</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anxiety</td>
<td>-.06</td>
<td>-.09</td>
<td>.15</td>
</tr>
<tr>
<td>Secondary Psychopathy</td>
<td>.28**</td>
<td>.30**</td>
<td>.38**</td>
</tr>
</tbody>
</table>

* p < .05. ** p < .01.
The current study was designed to increase our understanding of potential mediators in the association between college major and drinking patterns. While some literature suggests that business school students are drinking more alcohol than other students (Markland et al., 2008; Vansteenkiste et al., 2006; Waring et al., 1984a, 1984b), there is a lack of research exploring mechanisms that account for this consumption difference. To my knowledge, no research has assessed whether the proposed mediators (i.e., sensation seeking, drinking motives, primary psychopathy, and perceived drinking norms) in this study could help account for consumption differences across majors. In the remainder of the Discussion section, I will discuss implications of the current findings, study limitations, and suggestions for future research.

Current Study Implications

**Hypothesis 1.** The first hypothesis was that business majors would score higher on alcohol measures (i.e., binge drinking frequency, drinking frequency, and drinking problems) than arts and sciences students. In order to test this hypothesis, a MANCOVA was conducted. As mentioned previously, the multivariate analyses revealed that the omnibus $F$ of the main effect for major was not significant. Despite this result, I decided to continue with the analyses so I could explore potential directions for future research as
well as learn more about analyzing and reporting statistical data. The univariate results of this analysis revealed that the two groups only significantly differed in binge drinking frequency, such that business students reported engaging in binge drinking more than arts and sciences students. These results were interesting in that for the four years that Markland and colleagues (2008) collected and analyzed these data at this university, business students have differed significantly from students of other majors on all three of these drinking variables (Markland et al., 2008). One reason for these results may have been the comparatively small sample size of this study to other studies. Markland and colleagues (2008) obtained data on drinking patterns from 1,160 students across the four colleges at this university, and the other studies that have found differences in drinking patterns across majors were based on data from large national samples (e.g., Hingston et al., 2001; National Survey on Drug Use and Health, 2008). Thus, the sample size of the current study may have been too small to detect the hypothesized differences in drinking frequency and drinking problems. Another reason for these unexpected results in the current study could be that business students and arts and sciences students no longer differ in drinking frequency or drinking problems due to cultural changes and/or alcohol-based programming at this university. Replication studies are needed for exploring this result more fully.

Hypotheses 2 and 5. The second hypothesis was that group differences in major would exist such that business majors would score higher than arts and sciences students on measures of each of the proposed mediators (i.e., sensation seeking, social motives, enhancement motives, perceived drinking norms, and primary psychopathy). To test this hypothesis, another MANCOVA was conducted. The results indicated that group
differences for the two majors were only significant for sensation seeking tendencies and perceived norm for amount that students of the same major drink per week. As expected for Hypothesis 5, the results also revealed that the two groups did not significantly differ on secondary psychopathy or trait anxiety.

An interesting and unexpected result from this analysis was that arts and sciences students scored higher on measures of sensation seeking than did business students. This finding contrasts with past literature suggesting that business students score higher than other students on measures of extroversion (recall that sensation seeking is often considered a subcomponent of extroversion) (Skinner, 1981, 1983; Tobacyk & Cieslicka, 2000a, 2000b) and was contrary to hypotheses in the current study. These results may have been skewed due to the overrepresentation of accounting majors (which I will discuss in more depth in the limitations section) in the current sample of business students. Accounting majors (who often work primarily with mathematical equations) may possess different personality characteristics than other business majors (e.g., marketing) whose jobs often require more interpersonal contact. It could be that only particular majors within the business school score higher than arts and sciences students on measures of sensation seeking. In other words, due to the nature of their occupations, one could assume that accounting majors might not score as highly on measures of sensation seeking as, say, marketing or international business majors. To my knowledge, this distinction has yet to be explored in psychological literature and was not explored in the current study due to the small sample of business students.

Another reason these results were not comparable to past results may have been differences between samples. Skinner (1981, 1983) compared only third and fourth year
arts and business students, while the current sample included undergraduates across years, with the highest percentage (39%) being freshman and the lowest percentage (10%) being seniors. It could be that students differ in certain traits based on their year in college. That is, as students go through college, they may have experiences that either increase or decrease their willingness to attempt certain tasks (e.g., take risks, engage in sensation seeking behaviors), resulting in a fluctuation of their scores on sensation seeking measures depending on their year in college. Related, Tobacyk and Cieslicka (2000a, 2000b) utilized a sample that compared only marketing/management business students to English/humanities students, while the current study sample included a wide variety of participant majors within the schools of business and arts and sciences.

In terms of Hypothesis 5, previous research suggests that anxiety (which is one characteristic of secondary psychopathy) is associated with drinking behavior (e.g., American Psychiatric Association, 2000; Roberts et al., 1999). However, there was no a priori theoretical or empirical reason to expect that there would be differences between business and arts and sciences majors in trait anxiety. Thus, anxiety and secondary psychopathy were predicted to show direct relationships with drinking behavior, but not to be mediators of the association between choice of major and drinking behavior. As predicted, business students and arts and sciences students did not significantly differ on anxiety measures or on measures of secondary psychopathy.

**Hypotheses 3 and 4.** Hypotheses three and four addressed whether the association between choice of major and binge drinking frequency was mediated by the proposed study mediators (i.e., sensation seeking, social motives, enhancement motives, perceived drinking norms, and primary psychopathy). Since Hypothesis 2 analyses
revealed that group differences in major were present only for sensation seeking tendencies and perceived norm for amount that students of the same major drink per week, these were the only two proposed mediators used as variables in the analyses to test Hypotheses 3 and 4. The results indicated that sensation seeking did not mediate the relationship between choice of major and binge drinking frequency. However, the results did reveal the central finding of this study—perceived drinking norms (i.e., perceived norm for amount that students of the same major drink per week) was found to fully mediate the association between choice of business as a major and binge drinking frequency. This result suggests that while business students did report engaging in binge drinking more frequently than other students, they may also be overestimating the actual amount of alcohol others in their major consume. Therefore, they might consume more alcohol themselves in order to match their perceptions of others’ drinking habits.

Although there has been little study of the reliability of self-report alcohol consumption measures in college populations (Cosden, 2007), this factor is worth considering. While the tendency for adults and adolescents to underreport consumption can be a concern with self-report alcohol measures, some recent research suggests the opposite concern with college students. Kraus and colleagues (2005) conducted a field study to examine the validity of laboratory data suggesting that students underestimate personal alcohol consumption. Comparing actual blood alcohol content levels with self-report data, the researchers found that students overestimated their levels of consumption. Further, student accuracy decreased as the number of drinks and amount of time spent drinking increased. Interestingly, students who were male or who only drank beer were more accurate in their consumption predictions (Kraus et al., 2005). This finding is
relevant in regard to the current study in that students might not only be overestimating the amount of alcohol that others consume, but also overestimating their own consumption. If this is true, perceived drinking norm research could take on a different meaning than anticipated. Research regarding perceived drinking norms rests largely on the foundation that students overestimate the consumption patterns of others, not necessarily the consumption patterns of self. If students are overestimating in both domains, future research may need to address this area differently than in the past. For example, while self-report measures are typically less expensive and less time consuming than more direct methods of collecting consumption data, they might not be the most accurate method for researching this field. New measures and methods of collecting data may need to be created. Different treatment and prevention methods could also surface from this new research. Other aspects to consider regarding perceived drinking norms are developmental and social changes that tend to occur in the transition to college.

From a developmental perspective, there is an important relationship between perceived drinking norms and the importance of peer relationships in college student samples. Social learning theory suggests that behavior is learned through interacting with and observing others in social situations (Bandura, 1977). Early in life, parents and families have a strong influence on the attitude and behaviors of children (Kandel & Andrews, 1987). As children reach early adolescence, they spend less time with family and more time with friends (Csikszentmihalyi & Larson, 1984), beginning the transition to increased peer influence. This transition from familial influence to peer influence tends to become stronger throughout adolescence and into early adulthood (Berkowitz & Perkins). As students make the transition from high school to college, this process
intensifies as they begin to rely less on parental figures and more on their current social environment (e.g., peers). Peers become the main form of support and guidance for most students in college, heavily influencing choices and behaviors. In fact, some research suggests that peers have a greater impact on behavioral decisions than familial, biological, or cultural influences (Berkowitz & Perkins, 1986; Borsari & Carey, 2001). Related, recent research in this area has examined how disparity between parental and peer attitudes toward drinking influences individual consumption patterns. Cail and LaBrie (2010) found that disparity between the perceived drinking norms of peers versus parents was significantly correlated with individual drinking. In the same study, an analyses of gender differences revealed that disparity and gender interacted in such a way that increased disparity was associated with increased drinking for men in their sample. These developmental considerations could help explain why students feel pressure (whether internally or externally) to consume alcohol similarly to how they perceive their peers (i.e., perceived norms) are consuming alcohol.

Since Hypothesis 2 analyses revealed group differences in sensation seeking opposite from what was hypothesized (i.e., arts and sciences students scored significantly higher than business students on measures of sensation seeking), it makes sense that sensation seeking would not mediate the relationship between choice of business as a major and binge drinking frequency. It could also be that while some research suggests business students and other students differ in several personality characteristics (e.g., Skinner, 1981, 1983; Tobacyk & Cieslicka, 2000a), the perceived drinking norms of a student’s major may be more influential in actual drinking behavior than the hypothesized personality differences (i.e., sensation seeking).
It is quite interesting that the variable perceived norm for amount that students of the same major *drink per week* was found to mediate the association between choice of major and drinking behavior in this study while perceived norm for amount that students of the same major *drink per occasion* was not. Although the variable perceived norm for amount that students of the same major drink per occasion directly coincides with binge drinking frequency, the variable perceived norm that students of the same major drink per week is closely conceptually related to binge drinking frequency. That is, the former perceived norm variable taps into a student’s perceptions of others’ binge drinking on each occasion, while the latter perceived norm variable taps into a student’s perceptions of how many drinks others are drinking each day for an entire week. Since the business students in our sample on average reported engaging in binge drinking more frequently than arts and sciences students, one would expect that they would perceive others in their major as drinking more alcohol per occasion. Perhaps undergraduate students are not as proficient at accurately estimating what their peers drink per week as what they are at estimating what their peers drink per occasion.

**Hypothesis 6.** The sixth hypothesis (i.e., that anxiety and secondary psychopathy would be related to increased binge drinking frequency, drinking frequency, and drinking problems) was tested by computing a correlation matrix. Consistent with past literature (Gacono, 2000; Lewis & Cloninger, 1983), secondary psychopathy was significantly positively related to all three drinking variables. However, contrary to expectations, trait anxiety was not related to any of the drinking variables. This result is interesting in that the differential pattern obtained might suggest that the combination of anxiety and impulsivity is particularly deleterious in undergraduate samples. That is, since anxiety
and impulsivity are both characteristics of secondary psychopathy, it could be that this combination of traits is particularly important in determining whether or not someone chooses to use and/or abuse alcohol. However, it is also important to note the results regarding trait anxiety are somewhat consistent with past literature in that the relationship between trait anxiety and alcohol consumption has been contradictory, with some studies finding a relationship between the two variables (e.g., DeHaas et al., 2002; Pullen, 1994) and some studies finding no relationship (Schmidt et al., 2007; Teichman et al., 1989b).

**Treatment Implications.** Although the results of this study should be interpreted with caution due to the statistical violation discussed previously, I believe these exploratory results could still have important treatment and prevention implications for college campuses. If perceived alcohol norms within the business school exacerbate the binge drinking behavior of business students, prevention and treatment methods could focus on education regarding perceived versus actual drinking norms in various groups on campuses. Such strategies could assist with increasing awareness about the realistic drinking patterns of others. In fact, research suggests that education regarding perceived versus actual norms reduces alcohol consumption (Brown & Miller, 1995; DeMartini, Carey, & Carey, 2009; Lewis & Neighbors, 2006).

Related, treatment focused on changing the culture surrounding alcohol consumption for business majors may be beneficial. The National Institute on Alcohol Abuse and Alcoholism (2007) suggests that in order to achieve cultural change, schools must intervene at the individual-student level, the entire student body level, and the community level. A university interested in achieving such cultural change might sponsor and/or host recreational activities without alcohol. Business students in particular could
be heavily recruited and encouraged to attend these events. Further, for first-year business students, orientation procedures might require them to attend a certain number of these events each semester. Cultural change might also be achieved by having students create payoff matrices (i.e., a two-by-two chart listing the pros and cons of both using alcohol and not using alcohol), discuss their concerns and opinions about alcohol use with peers, and listen to testimonies from students or other community members who have experienced negative outcomes from alcohol use. Education regarding the dangers associated with alcohol use (particularly binge drinking), coping skills (e.g., stress management, coping with negative emotions), and self-monitoring tools for safer alcohol consumption might also be beneficial. Formats for these and similar interventions may include workshops, conferences, and educational seminars aimed at each of the three levels (i.e., individual-student, student body, and community). Though these interventions are relevant for changing the culture of the business school, they can also be used as general techniques and strategies for prevention on college campuses.

If the alcohol consumption culture within the business school is modified, students’ perceived norms are likely to change as well. This could result in business students feeling less pressure to drink increased amounts of alcohol in order to match their perceptions of others’ drinking habits within their major. Further, if the results of the current study are replicated, future evaluations of the alcohol-based programming on campus could examine whether different treatment interventions are effective for different subgroups of students. For example, further studies might find that various subgroups (e.g., student major, Greek system affiliation, extracurricular activity choice) respond favorably to different alcohol based programming. As a result, treatment
interventions could be tailored to match the characteristics and needs of specific subgroups.

**Study Limitations**

There were a number of methodological limitations in the current study. For instance, the current sample was limited to business students and arts and sciences students. While I intended to include education and engineering students, I was unable to obtain enough participants from either of these schools to include their data in the current analyses. This limitation decreased my intended sample size significantly and made the results less comparable to previous studies in this area (e.g., Markland et al., 2008). Related, this decrease in sample size may have decreased the necessary power to detect some hypothesized effects. In the first MANCOVA, observed power was relatively low for both drinking frequency and drinking problems (.25 and .14 respectively). A power level of 80% is typically viewed as acceptable (Cohen, 1988). At this level, an effect will be found when it truly exists (i.e., a statistically significant result) in the population 80 out of 100 times. Power less than 80% (i.e., .80) increases the risk of making a Type II error (i.e., failing to reject the null hypothesis when it is actually false). Thus, the probability of finding the hypothesized significance for the two variables above (i.e., drinking frequency and drinking problems) was incredibly low (e.g., a true effect in the population would only be found 25 out of 100 and 14 out of 100 times). Observed power was particularly low in the second MANCOVA (ranging from .08 to .40 for nonsignificant variables). This may have been due the number of variables (12) used in this analysis; a larger sample size or different statistical analysis (e.g., ANCOVA) may have increased power enough to detect any present effect(s). If observed power had been
high for such nonsignificant results, I could more confidently say that the hypothesized effects were not present in reality. However, since the observed power for all nonsignificant findings was low, it is less clear if the hypothesized effects was truly not present or if there was not enough power to detect them.

Adding participants from the business fraternity (to increase sample size and obtain an equal distribution of students across schools) is another limitation of the current study. Since initial membership in the fraternity is based largely on academic achievement, these students could possess personality characteristics that influenced the results. It stands to reason that students who are members of the club might be more responsible, motivated, and/or professionally-minded than students who choose to spend their time in other ways (e.g., not in a professional club). Such members might have to spend additional time studying and completing community service hours in order to remain in the club, which would take away from time other students might spend at parties (where alcohol is frequently consumed) with peers. In other words, business school students who were fraternity members may have reported less alcohol consumption because they belong to a subgroup of the business school with potentially different values (e.g., academics, community services) and personality characteristics (e.g., motivation, discipline) than other business school students not in such a club. This could have accounted, at least partially, for the lack of evidence in the current study that business school students often drink more often and in higher amounts than arts and sciences students (e.g., Markland et al., 2008). In the same vein, there was no coding in the data to make it possible to distinguish members of the business fraternity from general members of the business school. This limitation made it impossible to explore if
differences in drinking patterns or personality characteristics existed between these two groups.

Another limitation of the current study concerns socially desirable response sets. Although both social desirability scales (i.e., impression management, self-deceptive enhancement) were controlled for in the analyses, the nature of some questions from the Alcohol Survey (e.g., underage alcohol use) and the LSRP (e.g., manipulation of others) may have caused participants not to answer all of the questionnaires honestly. Since the social desirability scales are designed to assess a general repressive personality style, controlling for these responses sets might not have been an effective solution for all participants. For example, a participant without this general repressive personality style could have still repressed his/her true feelings with respect to a specific domain such as alcohol use. For these participants, controlling for socially desirable response sets would not have been sufficient because they would not have scored high on the social desirability scales.

The nature of the third item on both DNRF measures is another potential limitation. The third items requests that respondents estimate (from 0 drinks to 25 drinks) how many drinks an average student at the University or an average student in his/her major consumes on a given occasion. Since this item gives respondents the option of selecting a number from zero to 25, anchoring effects may have occurred. As a result, students may have overestimated the consumption patterns of others simply because large number options were available to select (e.g., a student may have recorded a 3 in a similar question without pre-identified numerical options, but selected a 7 on the DNRF simply because the scale went up to 25). There is also the possibility that one group of
students (e.g., arts and sciences, business) could have been more susceptible to such effects. One way to address this potential problem in the future would be to modify the measure such that respondents fill in their own numerical value instead of choosing from a list of predetermined numbers.

A final limitation was the sample of business students. The majority of business student participants were accounting (59%) majors. According to data from the School of Business Administration, there were 1,526 undergraduate students enrolled in the business school for the Fall 2009 semester. Of these students, the distribution of individuals in each major was as follows: 27% Undecided, 23% Marketing, 21% in both Finance and Accounting, 12% Entrepreneurship, 5% in both Leadership and Operations Management, 4% International Business, 3% Business Economics, and 2% MBA five-year program (J. Creech, personal communication, April 12, 2010). This data implies that accounting majors were overly represented in the current study. It stands to reason that there might be personality differences in students within the different business concentrations (e.g., accounting, management, and marketing majors might score differently on measures). Thus, if the current sample had been more representative of the true business school population, the results of this study may have differed.

**Directions For Future Research**

In addition to methodological refinements, there are a number of ways in which research concerning mechanisms accounting for alcohol consumption differences across majors could be extended in future research. For instance, if a larger sample can be obtained, it would be interesting to examine if group differences exist among all four schools (i.e., arts and sciences, business, education, engineering) on the proposed
variables. It would also be interesting to examine if students within the business school differ in alcohol consumption patterns or personality variables by specific major (e.g., marketing, international business, accounting, finance, etc.). In other words, one might expect that marketing students would exhibit different personality characteristics than would finance students. These specific analyses were not conducted in the current study due to the relatively small sample size. In order to conduct such analyses, future studies would need to ensure that equal numbers of participants from each business major were obtained.

A particularly interesting avenue for future research is the potential influence of gender in the proposed or a similar model. In the current study, the initial factorial MANCOVA referenced in the footnotes revealed a significant main effect for gender, making gender’s possible influence in this model relevant for discussion. Gender differences in drinking patterns among college students has been explored rather extensively in the past (e.g., Ham & Hope, 2003). However, gender might be an influential factor as either a mediator or moderator in the proposed model. Although the influence of gender was not a focus of the current study, the impact of this variable could have important implications in college alcohol research. Some research suggests that gender plays an important role in how much influence peers have on an individual’s behavior. For example, some studies have found that males are more influenced (e.g., more susceptible to perceived norms) by their peers than females (Cail & LaBrie, 2010; Lo, 1995; Read, Wood, Davidoff, McLackin, & Campbell, 2002). Thus, men in the current study may have been more greatly influenced by their perceptions of peer
drinking behaviors than women. This potential role of gender in this and similar models is an interesting avenue for future research.

It might also be useful in future research to examine alcohol consumption differences across majors in more depth. Since the results of the current study were not consistent with previous UD alcohol consumption data (e.g., business students did not differ from other students on all three alcohol consumption indices), it could be that consumption patterns are changing over time. Alternatively, the results of the current study could have been due to chance findings, especially since: 1) the current sample size was significantly smaller than other studies exploring drinking patterns (e.g., Markland et al., 2008; National Survey on Drug Use and Health, 2008), and 2) the initial MANCOVA exploring group differences between major on the three drinking variables was not significant. As a result, further research replicating the present findings could be beneficial.

Lastly, it might also be valuable to examine how alcohol consumption patterns of students in each major change over time. Students in some majors may begin their college careers consuming alcohol differently than they do by the time they reach graduation. Longitudinal research of this kind may find that students in some majors start their college careers drinking more heavily while students in other majors end their college careers drinking more heavily. This could be valuable for planning the timing of alcohol-based education programs for particular majors. If data could be collected from students across their undergraduate careers, patterns that could not be explored in the current study may be revealed.
In conclusion, this study was important in that it was the first study known by the current researcher to directly assess potential mediators in the association between choice of college major and drinking patterns. Although the results of the study were somewhat contrary to predictions, the study has interesting implications for why business students in this study reported engaging in problem drinking more often than other comparable students. Namely, this study suggested that the culture (i.e., perceived drinking norms) among business school students plays an important role in why business students are engaging in binge drinking more than arts and sciences students. That is, the results of this study revealed that perceived drinking norms could be a mediating factor in the association between choice of business as a major and drinking patterns. Further research is needed in order to fully understand the impact of perceived norms on alcohol consumption patterns across majors.
APPENDIX A
Demographic Sheet

Please take a few moments to complete the demographic information on this page and then proceed in completing the remainder of the assessment packet in the order in which the questionnaires are presented.

1. Age: _______

2. Gender: Male Female

3. Race:
   a. Asian/Pacific Islander
   b. African American
   c. Caucasian/White
   d. Native American
   e. Latino/Hispanic
   f. Other (specify): __________________________

4. Year in School: Freshman Sophomore Junior Senior

5. Which school are you enrolled in currently?
   a. Arts & Sciences
   b. Education
   c. Engineering
   d. Business

6. Please write in your current major and, when applicable, your double major and/or minor:

   Major: __________________________________________
   Major 2 (for double major, if applicable): ________________
   Minor (if applicable): ________________________________
APPENDIX B
University of Dayton Campus Alcohol Survey

Experiences with Alcohol
Please read this information before responding: Beer, wine, wine coolers, and liquor are all types of alcohol. For these questions one drink = 12 ounces of beer, one 4 ounce glass of wine, one ounce/one “shot” of liquor, or one mixed drink containing one ounce liquor.

1. Have you consumed alcohol in the past month?  Y or N

2. For MALES only: How many times have you had 5 or more drinks in a sitting during the last two weeks?
   a. Never
   b. Once
   c. Twice
   d. 3 times
   e. 4 times
   f. 5 times
   g. 6 times
   h. 7 or more times

3. For FEMALES only: How many times have you had 4 or more drinks in a sitting during the last two weeks?
   a. Never
   b. Once
   c. Twice
   d. 3 times
   e. 4 times
   f. 5 times
   g. 6 times
   h. 7 or more times

4. Beginning with last night, indicate the number of drinks (see above directions for definition of one drink) that you consumed each day last week. Please fill in a response for EVERY night. (If you drank between midnight and 6:00 A.M., include these drinks in the previous night’s drinks.)

<table>
<thead>
<tr>
<th>Day of Week (M, T, W, Th, F)</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td># of drinks</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
If you have not consumed alcohol in the last month, please answer never to all items in questions 5 & 6.

5. In the past month, how many times have you experienced one of these situations because of drinking alcohol? (0=never, 1=once, 2=two times, 3=three times, 4=four times, 5=five or more)

   ____ a. Had a hangover
   ____ b. Missed a class
   ____ c. Got hurt or injured after drinking
   ____ d. Performed poorly on a test or academic project
   ____ e. Forgot what you did the night before
   ____ f. Damaged property
   ____ g. Had sexual contact against your will
   ____ h. Taken advantage of another person sexually
   ____ i. Driven a car while impaired

6. In the past month, when you have been drinking, how often did you…
   (0=never, 1=rarely, 2=sometimes, 3=often, 4=always)

   ____ a. Use a strategy to drink more safely (e.g., pacing yourself, eating before drinking, or alternating alcoholic and nonalcoholic drinks)
   ____ b. Use a designated driver
   ____ c. Play a drinking game (like flip cup or quarters)

7. In the past month, how many times have you…
   (0=never, 1=once, 2=two times, 3=three times, 4=four times, 5=five or more)

   ____ a. Refused an offer of alcohol
   ____ b. Purchased or provided alcohol to someone under 21
   ____ c. Confronted a friend about his/her drinking when his/her safety/health was at risk
   ____ d. Considered confronting a friend about his/her drinking
   ____ e. Used a fake ID
   ____ f. Chosen not to drink because of academic assignments
APPENDIX C

Levenson’s Self-Report Psychopathy Scale (LSRP)

Please answer the following questions using the scale below:
1= Disagree strongly
2= Disagree somewhat
3= Agree somewhat
4= Agree strongly

Primary Psychopathy

_____ 1. Success is based on survival of the fittest; I am not concerned about the losers.
_____ 2. For me, what’s right is whatever I can get away with.
_____ 3. In today’s world, I feel justified in doing anything I can get away with to succeed.
_____ 4. My main purpose in life is getting as many goodies as I can.
_____ 5. Making a lot of money is my most important goal.
_____ 6. I let others worry about higher values; my main concern is with the bottom line.
_____ 7. People who are stupid enough to get ripped off usually deserve it.
_____ 8. Looking out for myself is my top priority.
_____ 9. I tell other people what they want to hear so that they will do what I want them to do.
_____ 10. I would be upset if my success came at someone else’s expense. RS
_____ 11. I often admire a really clever scam.
_____ 12. I make a point of trying not to hurt others in pursuit of my goals. RS
_____ 13. I enjoy manipulating other people’s feelings.
_____ 14. I feel bad if my words or actions cause someone to feel emotional pain. RS
_____ 15. Even if I were trying very hard to sell something, I wouldn’t lie about it. RS
_____ 16. Cheating is not justified because it is unfair to others. RS

Secondary Psychopathy

_____ 1. I find myself in the same kinds of trouble, time after time.
_____ 2. I am often bored.
_____ 3. I find that I am able to pursue one goal for a long time. RS
_____ 4. I don’t plan anything very far in advance.
_____ 5. I quickly lose interest in tasks I start.
_____ 6. Most of my problems are due to the fact that other people just don’t understand me.
_____ 7. Before I do anything, I carefully consider the possible consequences. RS
_____ 8. I have been in a lot of shouting matches with other people.
_____ 9. When I get frustrated, I often “let off steam” by blowing my top.
_____ 10. Love is overrated.

RS denotes reverse score items  (Note: Headings will be omitted for participant version)
APPENDIX D

The State-Trait Anxiety Inventory (STAI)

A number of statements which people have used to describe themselves are given below. Read each statement and then circle the appropriate value to the right of the statement to indicate how you *generally* feel. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe how you generally feel.

<table>
<thead>
<tr>
<th>A-Trait Scale</th>
<th>Almost Never</th>
<th>Sometimes</th>
<th>Often</th>
<th>Almost Always</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I feel pleasant</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>2. I feel nervous and restless</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>3. I feel satisfied with myself</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>4. I wish I could be as happy as others seem to be</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>5. I feel like a failure</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>6. I feel rested</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>7. I am “calm, cool, and collected”</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>8. I feel that difficulties are piling up so that I cannot overcome them</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>9. I worry too much over something that really doesn’t matter</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>10. I am happy</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>11. I have disturbing thoughts</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>12. I lack self-confidence</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>13. I feel secure</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>14. I make decisions easily</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>
15. I feel inadequate 1 2 3 4
16. I am content 1 2 3 4 RS
17. Some unimportant thought runs through my mind and bothers me 1 2 3 4
18. I take disappointments so keenly that I can’t put them out of my mind 1 2 3 4
19. I am a steady person 1 2 3 4 RS
20. I get in a state of tension or turmoil as I think over my recent concerns and interests 1 2 3 4

RS denotes reverse score items
APPENDIX E

Balanced Inventory of Desirable Responding (BIDR)

Using the scale of 1 to 7 below, write a number beside each statement to indicate how much you agree with it.

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

1. My first impressions of people usually turn out to be right.
2. It would be hard for me to break any of my bad habits. RS
3. I don’t care to know what people really think of me.
4. I have not always been honest with myself. RS
5. I always know why I like things. SDE
6. When my emotions are aroused, it biases my thinking. RS
7. Once I’ve made up my mind, other people can seldom change my opinion.
8. I am not a safe driver when I exceed the speed limit. RS
9. I am fully in control of my own fate.
10. It’s hard for me to shut off a disturbing thought. RS
11. I never regret my decisions.
12. I sometimes lose out on things because I can’t make up my mind soon enough. RS
13. The reason I vote is because my vote can make a difference.
14. My parents were not always fair when they punished me. RS
15. I am a completely rational person.
16. I rarely appreciate criticism. RS
17. I am very confident of my judgments.
18. I have sometimes doubted my ability as a lover. RS
19. It’s all right with me if some people happen to dislike me.
20. I don’t always know the reasons why I like to do things. RS
21. I sometimes tell lies if I have to. RS
22. I never cover up my mistakes.
23. There have been occasions when I have taken advantage of someone. RS
24. I never swear.
25. I sometimes try to get even rather than forgive and forget. RS
26. I always obey laws, even if I’m unlikely to get caught.
27. I have said something bad about a friend behind his or her back. RS
28. When I hear people talking privately, I avoid listening.
29. I have received too much change from a salesperson without telling him or her. RS
30. I always declare everything at customs.
31. When I was young I sometimes stole things. RS
32. I have never dropped litter on the street.
33. I sometimes drive faster than the speed limit. RS
34. I never read sexy books or magazines.
35. I have done things that I don’t tell other people about. RS
36. I never take things that don’t belong to me.
37. I have taken sick-leave from work or school even though I wasn’t really sick. RS
38. I have never damaged a library book or stole merchandise without reporting it.
39. I have some pretty awful habits. RS
40. I don’t gossip about other people’s business.

RS denotes reverse score items (Award 1 point for each “6” or “7” responses and 0 points for any other response)

Items 1-20 of this measure are part of the SDE subscale, items 21-40 are part of the IM subscale.
APPENDIX F

Arnett Inventory of Sensation Seeking

For each item, indicate which response best applies to you:
(A) describes me very well
(B) describes me somewhat
(C) does not describe me very well
(D) does not describe me at all

1. I can see how it would be interesting to marry someone from a foreign country.  
2. When the water is very cold, I prefer not to swim even if it is a hot day. RS
3. If I have to wait in a long line, I’m usually patient about it. RS
4. When I listen to music, I like it to be loud.
5. When taking a trip, I think it is best to make as few plans as possible and just take it as it comes.
6. I stay away from movies that are said to be frightening or highly suspenseful. RS
7. I think it’s fun and exciting to perform or speak before a group.
8. If I were to go to an amusement park, I would prefer to ride the rollercoaster or other fast rides.
9. I would like to travel to places that are strange and far away.
10. I would never like to gamble with money, even if I could afford it. RS
11. I would have enjoyed being one of the first explorers of an unknown land.
12. I like a movie where there are a lot of explosions and car chases.
13. I don’t like extremely hot and spicy foods. RS
14. In general, I work better when I’m under pressure.
15. I often like to have the radio or TV on when I’m doing something else, such as reading or cleaning up.
16. It would be interesting to see a car accident happen.
17. I think it’s best to order something familiar when eating in a restaurant. RS
18. I like the feeling of standing next to the edge on a high place and looking down.
19. If it were possible to visit another planet or the moon for free, I would be among the first in line to sign up.
20. I can see how it must be exciting to be in a battle during a war.

RS denotes reverse score items (Combine responses to items, with A = 4, B = 3, C = 2, D = 1, so that higher score = higher sensation seeking).

Odd numbered items are part of the Novelty subscale; even numbered items are part of the Intensity subscale.
APPENDIX G

Drinking Motives Measure

Using the response categories below, please indicate how often you drink for each of the following reasons. There are no right or wrong answers to these questions.

Response Scale

1. Never
2. Almost never
3. Some of the time
4. About half of the time
5. Most of the time
6. Almost always

Thinking of all the times you drink, how often would you say that you drink...

____1. …to forget your worries?  Co
____2. …because your friends pressure you to drink?  Cn
____3. …because it helps you enjoy a party?  S
____4. …because it helps you when you feel depressed or nervous?  Co
____5. …to be sociable?  S
____6. …to cheer up when you are in a bad mood?  Co
____7. …because you like the feeling?  E
____8. …so others won’t kid you about not drinking?  Cn
____9. …because it’s exciting?  E
____10. …to get high?  E
____11. …because it makes social gatherings more fun?  S
____12. …to fit in with the group you like?  Cn
____13. …because it gives you a pleasant feeling?  E
____14. …because it improves parties and celebrations?  S
____15. …because you feel more self-confident and sure of yourself?  Co
____16. …to celebrate a special occasion with friends?  S
____17. …to forget about your problems?  Co
____18. …because it’s fun?  E
____19. …to be liked?  Cn
____20. …so you won’t feel left out?  Cn

Note: S = Social motives, E = Enhancement motives, Co = Coping motives, Cn = Conformity motives
APPENDIX H

Drinking Norms Rating Form (for university)

This questionnaire asks you to estimate others’ drinking over the past three months.

For all questions, one drink equals: 5oz. wine, 12oz. beer (10oz. Microbrew; 8-9oz Malt Liquor, Canadian beer or Ice beer), 12oz. wine cooler, 6oz. Ice Malt Liquor, or 1 Cocktail with 1 oz. of 100 proof liquor or 1 ½ oz. (single jigger) of 80 proof liquor.

*This section asks you to estimate drinking behaviors of the typical UD student.*

1. Consider a typical week during the last three months. How much alcohol, on average (measured in # of drinks), does a typical UD student drink on each day of a typical week?

<table>
<thead>
<tr>
<th>Monday</th>
<th>Tuesday</th>
<th>Wednesday</th>
<th>Thursday</th>
<th>Friday</th>
<th>Saturday</th>
<th>Sunday</th>
</tr>
</thead>
</table>

2. How often do you think a typical UD student consumes alcohol?

- [ ] Never
- [ ] Three times a month
- [ ] Four times a week
- [ ] Less than once per month
- [ ] Once a week
- [ ] Five times a week
- [ ] Once a month
- [ ] Two times a week
- [ ] Six times a week
- [ ] Two times a month
- [ ] Three times a week
- [ ] Every day

3. How many drinks on average do you think a typical UD student consumes on a given occasion?

- [ ] 0 drinks
- [ ] 9 drinks
- [ ] 18 drinks
- [ ] 1 drink
- [ ] 10 drinks
- [ ] 19 drinks
- [ ] 2 drinks
- [ ] 11 drinks
- [ ] 20 drinks
- [ ] 3 drinks
- [ ] 12 drinks
- [ ] 21 drinks
- [ ] 4 drinks
- [ ] 13 drinks
- [ ] 22 drinks
- [ ] 5 drinks
- [ ] 14 drinks
- [ ] 23 drinks
- [ ] 6 drinks
- [ ] 15 drinks
- [ ] 24 drinks
- [ ] 7 drinks
- [ ] 16 drinks
- [ ] 25 or more drinks
- [ ] 8 drinks
- [ ] 17 drinks
4. Give your best estimate of the percentage (0-100%) of typical UD students who:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Never Drink</td>
<td></td>
</tr>
<tr>
<td>Drink once a month or less</td>
<td></td>
</tr>
<tr>
<td>Never drink more than 2 drinks at one setting</td>
<td></td>
</tr>
</tbody>
</table>

5. Please indicate how confident you are that your estimates of other students drinking are correct using the following scale (circle the appropriate number):

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not at all confident</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>Moderately confident</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>Absolutely Confident</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
</tbody>
</table>
APPENDIX I

Drinking Norms Rating Form (for major)

This questionnaire asks you to estimate others’ drinking over the past three months.

For all questions, one drink equals: 5oz. wine, 12oz. beer (10oz. Microbrew; 8-9oz Malt Liquor, Canadian beer or Ice beer), 12oz. wine cooler, 6oz. Ice Malt Liquor, or 1 Cocktail with 1 oz. of 100 proof liquor or 1 ½ oz. (single jigger) of 80 proof liquor.

*This section asks you to estimate drinking behaviors of the typical student in YOUR major.

1. Consider a typical week during the last three months. How much alcohol, on average (measured in # of drinks), does a typical student in YOUR major drink on each day of a typical week?

<table>
<thead>
<tr>
<th>Monday</th>
<th>Tuesday</th>
<th>Wednesday</th>
<th>Thursday</th>
<th>Friday</th>
<th>Saturday</th>
<th>Sunday</th>
</tr>
</thead>
</table>

2. How often do you think a typical student in your major consumes alcohol?

- Never
- Less than once per month
- Once a month
- Two times a month
- Three times a month
- Once a week
- Two times a week
- Three times a week
- Four times a week
- Five times a week
- Six times a week
- Every day

3. How many drinks on average do you think a typical student in your major consumes on a given occasion?

- 0 drinks
- 1 drink
- 2 drinks
- 3 drinks
- 4 drinks
- 5 drinks
- 6 drinks
- 7 drinks
- 8 drinks
- 9 drinks
- 10 drinks
- 11 drinks
- 12 drinks
- 13 drinks
- 14 drinks
- 15 drinks
- 16 drinks
- 17 drinks
- 18 drinks
- 19 drinks
- 20 drinks
- 21 drinks
- 22 drinks
- 23 drinks
- 24 drinks
- 25 or more drinks
4. Give your best estimate of the percentage (0-100%) of typical students in your major who:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
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</table>

5. Please indicate how confident you are that your estimates of other students drinking are correct using the following scale (circle the appropriate number):

<p>| | | | | | | |</p>
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<thead>
<tr>
<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>Not at all confident</td>
<td></td>
<td></td>
<td>Moderately confident</td>
<td></td>
<td>Absolutely Confident</td>
<td></td>
</tr>
</tbody>
</table>
References


Results from the 2008 National Survey on Drug Use and Health: national findings.


Initially, a factorial multivariate analysis of covariance (MANCOVA) was conducted to test Hypothesis 1. Major (i.e., business, arts and sciences) served as the grouping variable and the three drinking variables (i.e., binge drinking frequency, drinking frequency, and drinking problems) were used as dependent variables. The two social desirability variables were used as covariates, and gender was used as a factor in the analysis. The results only revealed a significant main effect for gender, $F(1, 153) = 11.93, p < .001$. Due to the results of the Chi-Square test of goodness-of-fit performed in preliminary analyses (i.e., men and women were equally distributed across the business and arts and sciences schools), I decided to run a separate MANCOVA to test Hypothesis 1 without using gender as a factor in the analysis.