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Emerging Adults' Perceptions of Normative Drinking Perceived Susceptibility to Different Types of Alcohol Consequences and Use of Protective Behavioral Strategies

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EMERGING ADULTS' PERCEPTIONS OF NORMATIVE DRINKING, PERCEIVED SUSCEPTIBILITY TO DIFFERENT TYPES OF ALCOHOL CONSEQUENCES AND USE OF PROTECTIVE BEHAVIORAL STRATEGIES

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ABSTRACT

EMERGING ADULTS' PERCEPTIONS OF NORMATIVE DRINKING, PERCEIVED SUSCEPTIBILITY TO DIFFERENT TYPES OF ALCOHOL CONSEQUENCES AND USE OF PROTECTIVE BEHAVIORAL STRATEGIES

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The purpose of the current study was to extend the limited research on alcohol norms specific to alcohol consequences via perceived susceptibility. A handful of previous studies have established that college students overestimate the number of alcohol-related consequences that others experience relative to themselves. The current research explored the relationships between perceived susceptibility to alcohol consequences compared to targets (i.e., same-sex close friend, and typical same-sex student) and other variables predictive of problematic alcohol use in emerging adults. Results indicated that emerging adults perceive the typical same-sex student at their university as experiencing the most alcohol-related consequences, followed by their close same-sex friend, and reporting that they themselves experience the least amount of alcohol-related consequences. Perceived susceptibility compared to the typical same-sex student was a stronger predictor of participants' experience of alcohol consequences than participants' own alcohol consumption. Contrary to expected, perceived susceptibility was not subject to gender differences. Perceived susceptibility to alcohol consequences remains a largely untouched area of alcohol research, but may lead to effective alcohol intervention programs based on personalized feedback.

This thesis is dedicated to my father, Venancio Joseph D'Lima, whose strength and encouragement have shaped my academic ambitions and aspirations. Thank you for providing me with all the resources and opportunities to achieve my goals. You instilled confidence in me and always provided a shoulder to lean on. You taught me that with hard work and persistence, I can accomplish anything.

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INTRODUCTION

Alcohol misuse among college students has been well documented (Hingson, Heeren, Winter, & Wechsler, 2005; National Center on Addiction and Substance Abuse [NCASA], 1994; O'Malley & Johnston, 2002; Perkins, Hanes, & Rice, 2005; Read, Kahler, Strong, Colder, 2006; Substance Abuse and Mental Health Services Administration [SAMSHA], 2010; Sher & Rutledge, 2007; Wechsler et al., 2002). There are many factors that may influence alcohol use. One variable that has been shown to influence college students' drinking is perception of campus drinking norms (e.g., Baer, Stacy, & Larimer, 1991; Mallet, Bachrach, & Turrisi, 2009; Perkins et al., 2005). That is, college students often perceive that the typical college student drinks more than they do. Another factor that may influence alcohol use among an emerging adult population is the degree to which individuals perceive that they are at risk for common alcohol-related consequences. That is, those who believe that they are invulnerable or less susceptible to the negative consequences associated with alcohol misuse may be more likely to engage in risky drinking and possibly less likely to use protective behavioral strategies while consuming alcohol. The purpose of the present study is to examine both a well-established variable (i.e., perceptions of drinking norms) and an underresearched, but possibly important variable (i.e., perceptions of susceptibility), as they relate to alcohol use, negative consequences associated with alcohol use, and the use of protective behaviors strategies when consuming alcohol.

Alcohol Consumption in College Students and Alcohol-Related Consequences

Alcohol use often increases when emerging adults transition from high school to

college. Previous research has found that college-bound high-school seniors consumed less alcohol than their non-college-bound peers; however, once in college, they drank more heavily than their non-college-bound high school peers (O'Malley & Johnston, 2002). In addition, the college culture and environment are associated with increases in alcohol misuse (Perkins et al., 2005; Sher & Rutledge, 2007). In a survey of students at 119 colleges, Wechsler and colleagues (2002) found as many as 80% of students' surveyed drank alcohol during the previous year. Among those who drank, 45% were categorized as binge drinkers. Researchers have shown consistently that approximately two out of five college students binge drink which is often defined as four or more drinks for women and five or more drinks for men in one sitting (Center for Disease Control, 2006; NCASA, 1994; O'Malley & Johnston, 2002).

Alcohol misuse during college can result in a spectrum of serious repercussions stemming from impaired control, risky behaviors, physical dependency, academic neglect, as well as problems in social-interpersonal relationships (Read et al., 2006). Alcohol misuse impacts students' academic performance via missed classes, poor grades, and college attrition (Engs, Diebold, & Hanson, 1994; NCASA, 1994; Wechsler et al., 2002).

In addition, college students who misuse alcohol are at an increased risk for physical fighting, vandalism, and violent crimes (Hingson et al., 2005; NCASA, 1994; Wechsler et al., 2002). Students who misuse alcohol are also at higher risk for sexual assault, date rape, and unprotected sex which can lead to sexually transmitted diseases or unplanned pregnancy (Hingson et al., 2005; NCASA, 1994; Wechsler et al., 2002). Furthermore, students who misuse alcohol put themselves and others at risk from alcohol

poisoning, driving under the influence, health-related consequences associated with alcohol abuse and/or dependence, and non-traffic-related injuries and death (Hingson et al., 2005; Knight et al., 2002; McKee, 1996; NCASA, 1994; Wechsler et al., 2002). In summary, the type, quantity, and severity of alcohol consequences experienced by emerging adults are influenced by multiple factors, however, the amount of alcohol consumed plays a chief role in alcohol-related consequences (Hingson et al., 2005; Martens, Brown, Donovan, & Dude, 2005a; Read et al., 2006; Wechsler et al., 2002).

Perceptions of Peer Drinking Norms

One of the most well-established influences on alcohol use among college students is their perception of college drinking norms, or rather, their misperception of college drinking norms (Baer & Carney, 1993; Baer et al., 1991; Bosari & Carey, 2001; Mallet et al., 2009; Neighbors, Dillard, Lewis, Bergstrom, & Neil, 2006; Perkins et al., 2005). More specifically, students' own drinking is influenced by his or her perception of a typical student's alcohol use. Perception of peer alcohol consumption is assessed by asking students to report their beliefs of the quantity and frequency of alcohol that the average college student consumes. In a sample of approximately 76,000 students across 130 colleges and universities evenly distributed across the Northeast, Midwest, South, and West regions of the United States, 71% of students overestimated their college-specific peer drinking norm, whereas 15% underestimated the peer norm and 14% accurately identified the peer norm (Perkins et al., 2005). Furthermore, research has expanded to include students' perceptions of alcohol use among same sex college students, those with fraternity or sorority membership, and also close friends (Baer & Carney, 1993; Mallett et al., 2009).

Although research has consistently demonstrated that students often overestimate alcohol use of others, empirical evidence has shown perception of close friends' alcohol use is more strongly correlated with students' own drinking than perceptions of alcohol consumption among the average college student (Baer et al., 1991, Mallett et al., 2009, Neighbors et al., 2006, Perkins et al., 2005). The drinking norms associated with college and university settings have been found to influence the amount and frequency that students drink (Perkins et al., 2005). In fact, perception of campus drinking norms has been shown to be a dramatically stronger predictor of students' own consumption than other important predictors such as gender, ethnicity, or sorority/fraternity status (Perkins et al., 2005). Moreover, researchers found for every drink students perceive is the norm, they consume an additional half drink during each drinking occasion (Perkins et al., 2005). Given the well-established association between perceptions of alcohol use among college student peers and the possibility that close friends' alcohol use may also be important for perceptions of alcohol-related consequences, both perceptions of college student drinking norm and alcohol use among one's peers will be examined in the present study.

Perceptions of Susceptibility

Another factor that has received less attention, but may influence alcohol misuse among emerging adults, is the perception of susceptibility to the negative consequences of alcohol consumption. More generally, perceived susceptibility to risk can be conceptualized as the probability of the occurrence of some future event (Short, 1984). Perceived susceptibility stems from the risk perception literature and is the conceptual opposite of invulnerability or invincibility. In this context, perceived susceptibility is the

degree to which one perceives oneself likely to experience risks directly related to alcohol use. Perceiving low or little threat from alcohol misuse may exacerbate participation in risky behaviors. Lapsley and Hill (2010) found danger invulnerability, defined as feelings of being indestructible or the desire to take physical risks, was positively related to drug use. In fact, the National Center on Drug Use and Health found the proportion of adolescents (12-17 years of age) who reported binge drinking was higher for those with low perceived risk, compared to adolescents who reported high perceived risk (SAMSHA, 2010). Similarly, alcohol misuse was more common for preadolescents (9-13 years of age) who reported low susceptibility to alcohol risk for themselves and high susceptibility to alcohol risk for their peers (De Los Reyes, Reynolds, Wang, MacPherson, & Lejuez, 2010).

Historically, the most widely accepted and intuitive explanation for the personal invulnerability (i.e., the opposite of susceptibility) often thought to be characteristic of adolescents has been David Elkind's theory. Originally introduced in the late 1960s, Elkind suggested that adolescent egocentrism leads to the construction of an "imaginary audience," which is the expected response of others to oneself, and "a personal fable," which is an untrue story an adolescent tells oneself (Elkind, 1970). Elkind proposes that as adolescents develop, the discrepancy between the imaginary audience and real audience diminishes, but the personal fable is never fully overcome and is dependent on how adequately the perceptions of the imaginary audience are adjusted to the real audience (Elkind, 1970). Parallel to Elkind's classic example of teenage girls' misperceptions of susceptibility to pregnancy from unsafe sex, in the current study's context of alcohol consequences, the emerging young adult tells herself a personal fable,

such as she is less likely than other students to experience alcohol consequences, and then it is probable she is less likely to use protective behavior strategies while drinking (Elkind, 1970).

More recently, Lapsley and Hill (2010) have proposed a second developmental explanation for personal invulnerability. Lapsley and Hill argue that risk taking is an adaptive response to the process of separation-individuation which often begins during adolescence. Both Elkind's and Lapsley and Hill's developmental theories support the claim that adolescent beliefs of personal invulnerability are a normal developmental phenomenon (Lapsley & Hill, 2010).

A non-developmental approach has also been put forth as an explanation for personal invulnerability (Weinstein, 1980). Weinstein (1980) asserts invulnerability is closely related to another concept in the health psychology field called optimism bias. Optimism bias is conceptualized by the idea that others are more at risk to a misfortune than oneself (Weinstein, 1980). Emerging adults' beliefs about lower susceptibility to alcohol risk compared to others represent this phenomenon.

Perceived susceptibility appears to be subject to gender and age effects. Gender may influence a person's perception of relative risk. Some research has shown that men perceive lower susceptibility to HIV/AIDS (Ebomoyi, 2001; Randolph, Torres, Gore-Felton, Lloyd, & McGarvey, 2009) and skin cancer (Lamanna, 2004) than women. The National Center on Drug Use and Health found male adolescents perceived less risk from drinking five or more drinks of alcohol in one sitting (i.e., binging) compared to female adolescents' perceptions of risk (SAMSHA, 2009). Additionally, female adolescents perceived greater risk from smoking one or more packs of cigarettes a day and smoking

marijuana once a month (SAMSHA, 2009). Gender differences were found in college students' reports of actual consequences experienced (Sugarman, DeMartini, & Carey, 2009). Women were found to be at an increased risk for tolerance, blacking out, passing out, and getting injured, whereas men experienced more risk for damaging property and going to school drunk (Sugarman et al., 2009). Although very limited research exists that has examined whether men perceive less risk from alcohol use than do women, extrapolating from the larger health literature, it is possible that women perceive higher susceptibility to alcohol-related consequences.

Perceived susceptibility may change as a function of age, in which perception of susceptibility decreases as adolescents increase in age. The National Center on Drug Use and Health found perceived susceptibility of risk from drinking five or more drinks of alcohol in one sitting (i.e., binging) decreased from 12 years of age through 17 years of age (SAMSHA, 2009). Similarly for marijuana, among young adolescents, perceived susceptibility associated with smoking marijuana once a month decreased from 12 years of age through 17 years of age.

Beliefs of invincibility and resiliency typically have been associated with the adolescence period (Elkind, 1970). However, researchers have raised the question of whether adolescents may, in fact, perceive themselves to be exposed to many risks and feel a greater sense of vulnerability than previously believed (Lapsley & Hill, 2010; Millstein & Halper-Felsher, 2002; Quadrel, Fischhoff, & Davis, 1993). For instance, young adults reported being less susceptible to general risk than middle school adolescents (Millstein & Halpern-Felsher, 2002).

In the context of sexual risk, high school students who reported having sex

without a condom perceived higher risk than those who had not had unsafe sex. Interestingly, the opposite pattern was found for college students, in which those who had unprotected sex perceived their risk as lower than those who had not had unsafe sex (Johnson, McCaul, & Klein, 2002). The difference in perception of susceptibility to risk supports the idea that perceived susceptibility is associated with stage of development. Furthermore, emerging adults (approximately 18-22 years of age) are believed to capture the developmental stage with the highest perceived invulnerability (Millstein & Halper-Felsher, 2002). For this reason, it has been argued emerging adults should be differentiated from adolescents in the context of perception of risk. Moreover, because of their perception of invulnerability, emerging adults may perceive others as more vulnerable than themselves. In turn, perceiving others as more vulnerable and one's self as less vulnerable to the possible risks associated with alcohol use, may yield more risky alcohol use and fewer protective behavior strategies to prevent negative alcohol consequences. If students view others at greater risk for negative psychological and health consequences from alcohol use than they do themselves (i.e., they view themselves as less vulnerable), this may reduce their use of protective strategies designed to prevent the potential negative consequences from alcohol misuse.

Although limited research has focused on perceived susceptibility and alcohol consequences, among the available literature, there is increasing evidence to support that young adults overestimate others' experience of alcohol consequences relative to their own experience. For instance, researchers compared the number of alcohol consequences reported by students and their perceptions of the number of consequences experienced by a best friend, a student in his fraternity or her sorority, and a typical college student (Baer

& Carney, 1993). Students reported no significant difference in the number of consequences experienced personally and perceived number of consequences experienced by a close friend; however, students reported experiencing significantly fewer consequences than the typical college student and a typical member of his fraternity or her sorority. In addition, a recent study by Lee, Geisner, Patrick, and Neighbors (2010) confirmed that students perceived the typical college student to experience more frequent consequences from alcohol use than was actually reported by students. Although low perceived susceptibility is believed to influence, and in fact, underlie some types of risk behavior (e.g., using drugs, smoking, unsafe sex; Hampson, Severson, Burns, Slovic, & Fisher, 2001; Johnson et al., 2002; Vollrath, Knoch, & Cassano, 1999), whether perceptions of personal susceptibility may affect alcohol consequences through inhibition of utilizing protective behaviors strategies when using alcohol, is not known.

Protective Behavior Strategies

College students have informally developed a toolbox of techniques for safer alcohol use and ways to drink in moderation (Howard, Griffin, Boekeloo, Lake, & Bellows, 2005). These techniques have recently been referred to as protective behaviors strategies, which are defined as cognitive-behavioral strategies one can potentially use to limit alcohol use and subsequently decrease number of alcohol-related consequences (Martens et al., 2008). Protective behavioral strategies can also be thought of as the actions one can take to reduce the likelihood of excessive drinking, which again, decreases the number of alcohol-related consequences experienced (Martens et al., 2004). Through several studies, college students have reported multiple strategies in order to

limit their exposure to risks and danger associated with alcohol use. Students report engaging in certain behaviors such as eating before or during alcohol use, having an excuse ready for turning down a drink, holding a drink but not consuming it, pre-gaming in a safe place (i.e., dorm room), mixing their own drinks, alternating between alcohol and non-alcoholic beverages, counting drinks, pacing the number of drinks consumed in a given time frame, setting a pre-planned limit of drinks, using the buddy system to monitor unsafe levels of drinking, avoiding drinking games, and not drinking the hour or two before going home (Benton, Schmidt, Newton, Shin, Benton, & Newton, 2004; Delva, Smith, Richard, Howell, Harrison, Wilke, & Jackson, 2004; Howard et al., 2005).

Protective behavioral strategies are negatively correlated to alcohol-related consequences (Martens et al., 2008). The more protective behavioral strategies are used the lower number of personal and social alcohol-related consequences experienced. Research has shown that even for binge drinking, students taking precautions and engaging in self-protective strategies were less likely to experience common consequences like performing poorly on academic tasks or being involved in a physical fight (Benton et al., 2004). Additional research demonstrated college students using fewer protective behavioral strategies while consuming alcohol were more likely to be physically injured or physically injure another person, be involved in a fight, experience impaired memory, or do something they later regretted (Martens et al., 2004).

Protective behavioral strategies use may be dependent on gender. Recent empirical evidence concerning gender differences in use of protective behavioral strategies found that women were significantly more likely than men to use several protective behavioral strategies. Specifically, female college students reported using the

following strategies more than male peers: determine in advance not to exceed a certain number of alcoholic drinks, have a friend let them know they had enough to drink, and drink a non-alcoholic beer or other beverage (Sutfin et al., 2009). Similar use of protective behavioral strategies between male and female college students was found in a study of more than 1300 participants, in which at least two-thirds of students reported always using a designated driver, eating before and during drinking, and keeping track of number of drinks (Delva et al., 2004). Delva and colleagues (2004) found that female college students using the lowest number of protective behavior strategies compared to female students using the highest number of protective behavior strategies were 6.5 times more likely to experience alcohol-related consequences. Male college students using the lowest number of protective behavior strategies compared to male students using the highest number of protective behavior strategies were only 1.74 times more likely to experience alcohol-related consequences; this may indicate that male students overall are more likely to experience alcohol consequences regardless of use of protective behavioral strategies (Delva et al., 2004). Men reported that the typical same-sex college student has significantly less concerns about campus alcohol practices (i.e., student drinking) than themselves; also, male students believed that the typical male student would have less concern about campus alcohol practices than the typical female college student (Suls & Green, 2003). Indeed, female college students reported more concerns of campus alcohol practices than either a same-sex typical student (i.e., typical female student) or opposite-sex typical student (i.e., typical male student). Furthermore, male college students have reported more social pressure to use alcohol and also indicated higher levels of embarrassment concerning the expression of drinking-related concerns

(Suls & Green, 2003). Specifically, male students were more likely to believe that expressing drinking-related concerns indicated an individual was having greater difficulties fitting in, which could then result in males using less protective behavior strategies (Suls & Green, 2003).

Theoretical Background

Several theories were relevant for the present study. Because peer norms are examined in the present study, the social norm theory, which considers the effect of the perception of peer norms on alcohol consumption, appears to be important. However, in studies utilizing social norms model as a backdrop, alcohol consumption is often treated as a dependent variable predicted by perception of peer norms and actual peer norms (Perkins, 1997). In contrast, in the present study, alcohol consumption will serve as a predictor. Specifically, alcohol consumption will predict alcohol consequences experienced by participants, as well as the perceptions of susceptibility to alcohol consequences for self compared to a same-sex close friend and a typical same-sex college student. Thus, while a common model in the alcohol literature, social norms theory will not be used as a theoretical framework in the present study.

Alternatively, theories with a focus on behavioral change such as the theory of reasoned action (Ajzen & Fishbein, 1980) and the theory of planned behavior (Ajzen, 1991) are common in a broad range of areas in the health behavior literature (see meta-analyses by Cook & French, 2008; Sheppard, Hartwick, & Warshaw, 1988). According to the theory of reasoned action, health-seeking behavior is determined by intention of action which is further predicted by attitudes toward behavior and perception of social pressure to perform the action. Likewise, the theory of planned behavior maintains the

intentions component as an immediate predictor of the health behavior, of which intentions are predicted by attitudes toward the behaviors, subjective norms, and perceived behavioral control. The components (i.e., intention and attitudes toward the behavior) from either of these behavior change theories are not relevant in the present study.

Rather, the present research will utilize the Health Belief Model (HBM; Rosenstock, Strecher, & Becker, 1988). The Health Belief Model has been examined in several alcohol-focused studies (Minugh, Rice, & Young, 1998; Von Ah, Ebert, Ngamvitroj, Park, & Kang, 2004). The Health Belief Model is comprised of the following components: perceived susceptibility, perceived severity, perceived threat (susceptibility and severity), perceived benefits, perceived barriers, and cues to action (Janz & Becker, 1984). The HBM captures two key aspects of the current study; emerging adults have the desire to avoid alcohol consequences, and there are specific health protective actions (i.e., protective behavioral strategies), that can prevent the experience of alcohol consequences. Thus, the belief that perceived susceptibility predicts the likelihood of using recommended protective behaviors strategies is theoretically supported.

Model Summary

Although numerous studies have examined how perceptions of other student's alcohol use may be associated with one's own drinking, few studies have examined the construct of personal susceptibility to alcohol-related consequences as related to alcohol use among other emerging adults (i.e., typical same-sex student and close same-sex friends). As shown in Figure 1, perceived susceptibility was a key focus of the

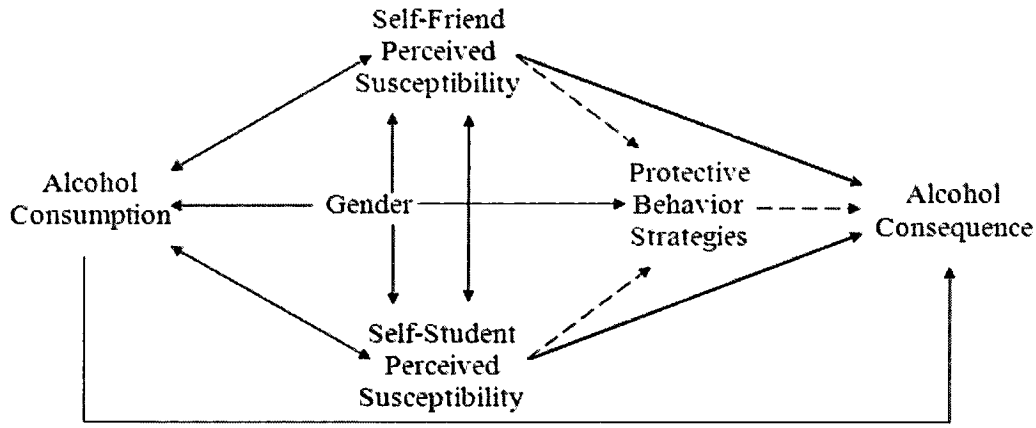

Figure 1. Conceptual Model

proposed model of the current study. The model suggests that students who perceive same-sex typical students and close same-sex friends as experiencing greater risk from alcohol use, will report fewer protective behavioral strategies when consuming alcohol. Subsequently, they will believe they are less susceptible to negative alcohol consequences than typical college students or close friends. That is, if one believes that others are at greater risk for potential consequences from alcohol misuse (i.e., higher susceptibility), it is possible that participants will use fewer protective behavioral strategies leading to the experience of more alcohol-related consequences. In contrast, if respondents report that they will experience similar or possibly more potential consequences from alcohol use than a typical same-sex college student and same-sex close friend, it follows that participants will report greater use of protective behavior

strategies. In turn, the use of protective behavior strategies is expected to reduce actual alcohol-related consequences experienced by students.

Research Questions

1. Do emerging adults overestimate others' (i.e., close same-sex friend and typical same-sex college student) experience of alcohol-related consequences compared to their own experience of alcohol-related consequences?
2. Does emerging adults' perceived susceptibility compared to close same-sex friend and typical same-sex student predict their own experience of alcohol consequences?
3. a) Do protective behavior strategies mediate the relationship between the participants' perceived susceptibility relative to their close same-sex friend and their own experience of alcohol consequences?

   b) Do protective behavior strategies mediate the relationship between the participants' perceived susceptibility relative to the typical same-sex college student and their own experience of alcohol consequences?
4. Does participant gender predict emerging adults' perceived susceptibility to alcohol consequences compared to close same-sex friend or the typical same-sex student?

Hypotheses

1. Participants will report higher perceived alcohol-related consequences for the typical same-sex college student as compared to the close same-sex friends' susceptibility to alcohol-related consequences.
2. a) Participants' perceived susceptibility compared to the typical same-sex student's risk of alcohol-related consequences will predict participants' alcohol-related consequences experienced. Specifically, the more the participants perceives the

typical same-sex student as experiencing alcohol-related consequences, the more alcohol-related consequences the participant will report experiencing.

b) Participants' perceived susceptibility to alcohol consequences compared to their close same-sex friend will better predict participants' number of alcohol-related consequences than when participants compare themselves to the typical same-sex student. The more participants perceive their close same-sex friend experiences alcohol-related consequences, the more alcohol-related consequences the participant will report experiencing.

3. a) Protective behavior strategies are expected to mediate the relationship between participant's susceptibility compared to the typical same-sex student and overall alcohol consequences experienced by the participant.

   b) Protective behavior strategies are expected to mediate the relationship between participant's susceptibility compared to their close same-sex friend and overall alcohol consequences experienced by the participant. Specifically, perceptions of others' as more susceptible than one's self is expected to be related to lower use of protective behavior strategies.

4. Participant gender is expected to predict perceived susceptibility, that is, male emerging adults will have lower perceived susceptibility scores across target comparisons than female emerging adults.

CHAPTER 2

METHOD

Participants

The current study sample was composed of 333 undergraduate students from a mid-Atlantic university (see Table 1 for sample descriptive statistics). The sample was comprised of 213 female (64%) and 120 male (36%) students with an average of 20.46 years of age (*SD* = 1.66 years). To be eligible for the current study, participants had to be between 18 and 25 years of age, have consumed alcohol in the past six months and reported having a close same-sex friend who had also consumed alcohol in the past six months. The majority of participants resided in university housing (n = 144; 43.2%) or off campus housing (n = 122; 36.6%); a smaller percentage resided at their family residence (n = 67, 20.1%). Year in college was approximately equally distributed: freshmen (n = 83; 24.9%), sophomores (n = 74; 22.2%), juniors (n = 99; 29.7%), and seniors (n = 77; 23.1%). The majority of the sample reported their ethnicity as Caucasian (59.8%).

Measures

Participants completed an online survey comprised of several questionnaires. Specifically, respondents completed the Young Adult Alcohol Consequences Questionnaire (YAACQ; Read et al., 2006) three times: once as it pertained to their own experience of alcohol consequences, once based on their perceptions of a close same-sex friend's susceptibility to alcohol consequences, and once based on their perceptions of a typical same-sex student's susceptibility to alcohol consequences. In addition, respondents completed the Daily Drinking Questionnaire (DDQ; Collins, Parks, &

Table 1

Sample Descriptives

	N	%
Gender		
Female	213	64%
Male	120	36%
Age		
18	36	10.8%
19	71	21.3%
20	71	21.3%
21	78	23.4%
22+	77	23.1%
Race/Ethnicity		
White, Non-Hispanic	197	59.2%
Black/African American	84	25.2%
Multiracial	20	6.0%
Asian	9	2.7%
Hispanic/Latino	9	2.7%
American Indian/Alaskan	4	1.2%
Native Hawaiian/Pacific Islander	3	0.9%
Other	7	2.1%

Marlatt, 1985). The DDQ assessed the participants' alcohol use. Participants also completed the Drinking Norms Rating Form (Baer, Stacy, & Larimer, 1991) twice: once as it pertained to participants' perceptions of their close same-sex friend's alcohol use (i.e., days of alcohol use per week, number of standard drinks on each drinking occasion) and once as it pertained to participants' perceptions of the typical same-sex student at their university. In addition, participants completed the Protective Behavioral Strategies Survey as it pertained to strategies they used in the past three months to reduce risks associated with alcohol use (Martens et al., 2005b). Respondents also completed a sociodemographic questionnaire.

Young Adults Alcohol Consequences Questionnaire. The YAACQ is a 48-item questionnaire, designed for college students, that assesses alcohol-related consequences (Read et al., 2006). The YAACQ consists of eight subscales that measure the following aspects of alcohol consequences: social-interpersonal, impaired control, self-perception, self-care, risk behaviors, academic/occupational, physical dependence, and blackout drinking consequences (see Appendix A). For the purposes of the present study, data from three subscales of the YAACQ were examined: academic/occupational alcohol-related consequences, risk behaviors alcohol-related consequences, and social-interpersonal alcohol-related consequences. In addition to completing the YAACQ as it pertained to their own alcohol use, in order for the respondent to complete the YAACQ as it pertained to their perception of their same-sex close friend's alcohol use and their beliefs about a typical same-sex student's alcohol use, instructions for the YAACQ and its items were reworded slightly in order to assess participants' perceptions of alcohol

consequences experienced by the two target comparisons (i.e., close same-sex friend and typical same-sex college student).

Administration of the YAACQ resulted in three subscale scores (i.e., academic/occupational total, risk behaviors total, and social-interpersonal) for each of the targets examined (i.e., self, close same-sex friend, typical student). Thus, a total of nine subscale scores were derived from the YAACQ. Three subscale scores for the respondent represented alcohol consequences for each of the dimensions experienced in the previous three months (SOC, RISK, & ACAD). In order to create six perceived susceptibility variables, each subscale total for the targets (i.e., friend and student) was subtracted from each respective subscale score for the participant. For example, to create perceived susceptibility to risk behaviors compared to the friend (PSF-RISK), the same-sex friend's total score on the risk behavior subscale was subtracted from the participant's total score on the risk behavior subscale. Likewise, the typical same-sex student's total score on the risk behavior subscale was subtracted from the participant's total score on the risk behavior subscale to create a score that represented perceived susceptibility to risk behaviors compared to the typical student (PSST-RISK). This process was repeated for the other two types of consequences (academic/occupational and social). Again, this resulted in a total of three perceived susceptibility that assessed one's perception of alcohol risk compared to their close same-sex friend (PSF-SOC, PSF-RISK, and PSF-ACAD) and a total of three perceived susceptibility scores that reflected the participants perception of alcohol risk as compared to the typical student (PSST-SOC, PSST-RISK, PSST-ACAD). Negative scores indicated less perceived susceptibility and positive scores indicated more perceived susceptibility, whereas scores that were close to

zero indicated little perceived difference in susceptibility to the negative consequences of alcohol use for each of the YAACQ subscales examined.

The YAACQ synthesizes three prominent measures that assess symptoms and behaviors of problematic alcohol use: Young Adult Alcohol Problems Screening Test (YAAPST; Hurlbut & Sher, 1992), Drinker Inventory of Consequences (DrInC; Miller, Tonigan, & Longabaugh, 1993), and items developed from the criteria for alcohol abuse and dependence as outlined in the Diagnostic and Statistical Manual, Fourth Edition (*DSM-IV*; American Psychiatric Association, 1994). In addition, the YAACQ includes several unique items created by the authors. Items are rated on a dichotomous scale indicating the presence or absence of each alcohol-related consequence. Item scores are typically summed to form domain-specific alcohol-related consequence subscale scores (i.e., social-interpersonal consequences, risk behaviors consequences, and academic/occupational consequences). Sample items from the YAACQ include, "While drinking, I have said or done embarrassing things," from the social-interpersonal subscale and, "I have driven a car when I knew I had too much to drink to drive" from the risk behavior subscale. An example of the modification of the YAACQ items to specify that the participant should estimate their close same-sex friend's experience of consequences was, "My close same-sex friend has driven a car when they knew they had too much to drink to drive safely. " An example of the modification of the YAACQ items to specify that the participant should estimate the typical student's experience of consequences include, "A typical student of my gender has driven a car when they knew they had too much to drink to drive safely. "

The YAACQ has well-established psychometric properties demonstrated by high internal consistency with Cronbach's alphas ranging from .96-.98, high test-retest reliability with a reported Pearson correlation of $r(82) = .86$ between the YAACQ measured at two time points six weeks apart (Read et al., 2007). The YAACQ also demonstrates concurrent validity shown by a strong positive relationship, $r(124) = .79$, $p < .001$, with the Rutgers Alcohol Problem Index (RAPI; White & Labouvie, 1989), frequency, $r(337) = .36$, $p < .001$, and quantity of drinking, $r(338) = .31$, $p < .001$, and a negative relationship, $r(337) = -.16$, $p < .01$, with grade point average (Read et al., 2006). Read and colleagues (2007) also found predictive validity of the YAACQ, ten weeks after initial administration. for frequency, $r(62) = .55$, $p < .001$, quantity, $r(62) = .30$, $p < .05$, binge drinking, $r(62) = .49$, $p < .001$, and academic performance, $r(62) = -.29$, $p < .05$.

Daily Drinking Questionnaire. The DDQ (Collins, Parks, & Marlatt, 1985) is a widely-used measure that assesses alcohol consumption (see Lecci, MacLean & Croteau, 2002; Mallet et al., 2008; Morean & Corbin, 2008). Participants were asked to report the usual number of drinks they consume for each day of the week (see Appendix B). Participants completed the DDQ based on their drinking patterns during the past three months. Two scores were created. These scores reflected total number of drinks consumed during the weekend (i.e., Friday and Saturday) and during the weekday (i.e., Monday to Thursday). Alcohol consumption in the model was measured by total number of drinks consumed on the weekend whereas weekday consumption was measured to provide better context of the representativeness of the current sample to other student populations and was not included in the model.

Drinking Norms Rating Form. The DNRF (Baer, Stacy, & Larimer, 1991) is a modified version of the Daily Drinking Questionnaire frequently used to assess the participants' perceptions of specific targets' drinking quantity and frequency (Broadwater, Curtin, Martz, & Zrull, 2006; Larimer, Irvine, Kilmer, & Marlatt, 1997; Neighbors et al., 2006). The current study asked participants to rate their perceptions of typical weekly drinking quantity for their close same-sex friend and the average same-sex student for the past three months (see Appendix C). Total weekend drinking was computed from number of standard drinks consumed on Friday and Saturday for each close same-sex friend and for typical same-sex student. Perceived total weekday consumption for close same-sex friend and typical same-sex student was also measured to replicate previous findings that students overestimate others' drinking and demonstrate the current sample was representative of the same population of students susceptible to this norm belief; however, total weekday consumption was not included in the model.

Protective Behavioral Strategies Survey. The PBSS is a 15-item measure specifically designed for a college-student population that was used to assess protective behavioral strategies used by participants in order to reduce the number of alcohol-related consequences (Martens et al., 2005b). The PBSS consists of three subscales: limiting/stopping drinking subscale consisting of seven items, manner of drinking subscale consisting of five items and the serious harm reduction subscale consisting of three items (see Appendix D). Participants responded on a dichotomous scale; several of the items are reversed scored. The limiting/stopping subscale is composed of items that directly and indirectly measure the behavior of limiting or slowing down consumption of alcohol. A sample item from the limiting/stopping subscale is, "determine not to exceed a

set number of drinks." The manner of drinking subscale is composed of items that measure the different ways alcohol is consumed. A sample item from the manner of drinking subscale is, "avoid mixing different types of alcohol." The last subscale, serious harm reduction, is composed of items that measure the avoidance of potentially dangerous consequences. A sample item from the serious harm reduction subscale is, "use a designated driver."

The PBSS has demonstrated strong psychometric properties. For instance, Martens et al. (2005b) reported internal consistency for limiting/stopping, manner of drinking, and serious harm reduction subscales were adequate with Cronbach's alphas of .81, .73, and .63, respectively. The PBSS authors contend that the serious harm reduction subscale has a lower internal consistency than the other subscale due to the smaller number of items. Convergent validity has been evidenced by correlations between scores on the protective behavioral strategies subscales with reports of alcohol consumption, $r(437) = -.29$ to $-.47$, $p < .01$, as measured by number of drinks per week and alcohol-related consequences, $r(437) = -.22$ to $-.39$, $p < .01$, as measured by the RAPI (Martens et al., 2005b).

Demographic Questionnaire. A brief questionnaire was included to assess gender, ethnicity, school year, residence information, and several questions relating to parental education and alcohol use. Students were also asked to report their grade point average (see Appendix E).

Procedures

Data were collected using an interactive online research system in which students could view a short description of the proposed study and know what their involvement

would entail. Students could voluntarily sign up for the study using an anonymous five digit ID code, therefore, their identity was unknown. Once directed to the study link, they could participate in the survey. This study met APA ethical standards (APA, 2002) and was IRB-approved. The order of the questionnaires was counterbalanced. Specifically, a Latin Square approach allowed for six different combinations of the study measures. The survey was counterbalanced for these orders to reduce the possibility of order effects. A randomized list of the orders was created using a random list generator (Haahr, 2011) and as participants signed up they were assigned to orders based on the randomized list. All students received research credit in their psychology courses for their participation in this study.

CHAPTER 3

RESULTS

Power Analysis

Before data collection began, the conceptual model was specified and a power analysis was conducted to calculate the minimum sample size required to determine a good-fitting mode (MacCallum, Browne, & Sugawara, 1996). In order to establish the necessary number of participants, degrees of freedom were calculated (see Appendix F). The power analysis was conducted using the open-source statistical package R (R Development Core Team, 2008). An algorithm specifying preset values, including degrees of freedom set to 45, alpha set to .05, root means square error of approximation for the null model set to .05, and the root mean square error of approximation for the alternative model set to .01, yielded different power values based on varying sample sizes (Padilla, 2010). The optimal sample size was 285 participants with power of .80 to determine a good-fitting model (see Appendix F). After deleting data as described below, the final sample of 333 participants provided sufficient power to test the proposed model.

Preliminary Analyses

A total of 427 participants completed the survey. Data (N = 427) were screened to ensure study eligibility was met. Data were deleted from a total of 94 participants (23%), because they did not meet the study age criteria (i.e., they were older than 25, n = 71; 17%), had not consumed alcohol in the past six months (n = 26; 6%), were a graduate student (n = 1), or did not report gender (n = 2). Missing data in the final retained sample were handled in MPlus using maximum likelihood (ML) estimation, which, instead of replacing each missing value in the data, estimates model parameters using all the

information in the dataset (Muthen, 1999). There were no extreme outliers present in the model variables.

Descriptive Statistics

Descriptive statistics of the model variables can be found in Table 2. Participants reported consuming an average of 2.09 (*SD* = 3.63) drinks from Monday through Thursday. Participants perceived their close same-sex friends to consume 4.28 standard drinks from Monday through Thursday (*SD* = 6.28); they perceived the typical same-sex student at their university to consume 5.18 standard drinks (*SD* = 5.17). The average total weekend (e.g., Friday and Saturday) alcohol consumption was 8.52 (*SD* = 6.13) standard drinks for participants. Participants perceived their close same-sex friends to have an average total weekend (e.g., Friday and Saturday) consumption of 11.57 standard drinks (*SD* = 7.60) and perceived the typical same-sex student at their university to have an average total weekend (e.g., Friday and Saturday) consumption of 12.59 standard drinks (*SD* = 6.21). Participants were presented with an image defining what consists of a standard drink.

The average number of overall consequences, composed of social/interpersonal, risk behavior, and academic/occupational consequences subscales, experienced in the past three months by the participants was 4.82 (*SD* = 4.69, N = 325). See Table 3 for descriptive statistics of specific types of alcohol consequences experienced by each target. Participants perceived their close same-sex friend as experiencing an average number of 7.86 (*SD* = 5.54, N = 315) overall alcohol consequences in the past three months; they perceived the typical same-sex student at their university as experiencing an average number of 12.71 (*SD* = 5.00, N = 310) overall alcohol consequences during the

Table 2

Descriptive Statistics for Model Variables

Variable	*N*	α	*M*	*SD*
Self				
Total Weekend Drinking	319		8.52	6.13
Social/Interpersonal Consequences	330	.78	2.02	1.83
Risk Consequences	330	.81	1.86	2.10
Academic/Occupational Consequences	331	.80	.91	1.42
Overall Consequences Total	325	.90	4.82	4.69
Protective Behavioral Strategies	323	.77	9.12	3.38
Perceptions of Same-Sex Close Friend				
Total Weekend Drinking	326		11.57	7.60
PSF-Social/Interpersonal	324		-1.02	2.08
PSF-Risk Behaviors	322		-1.29	2.41
PSF-Academic/Occupational	325		-0.84	1.80
PSF-Overall	310		-3.17	5.25
Perceptions of Typical Same-Sex Student				
Total Weekend Drinking	328		12.59	6.21
PSST-Social/Interpersonal	322		-2.29	2.13
PSST-Risk Behaviors	320		-3.40	2.67
PSST-Academic/Occupational	324		-2.26	1.99
PSST-Overall	303		-7.89	5.85

Table 2 Continued

Variable	Min	Max	Skewness	Kurtosis
Self				
Total Weekend Drinking	0	40	1.39	2.47
Social/Interpersonal Consequences	0	6	0.78	-0.40
Risk Behaviors Consequences	0	8	1.15	0.64
Academic/Occupational Consequences	0	5	1.56	1.29
Overall Consequences Total	0	19	1.14	0.60
Protective Behavioral Strategies	0	15	-0.13	-0.61
Perceptions of Same-Sex Close Friend				
Total Weekend Drinking	0	56	1.74	2.47
PSF-Social/Interpersonal	-6	5	-0.11	0.34
PSF-Risk Behaviors	-8	5	-0.47	0.33
PSF-Academic/Occupational	-5	4	-0.45	0.38
PSF-Overall	-19	10	-0.59	0.82
Perceptions of Typical Same-Sex Student				
Total Weekend Drinking	0	60	1.88	2.47
PSST-Social/Interpersonal	-6	4	0.11	-0.74
PSST-Risk Behaviors	-8	3	0.02	-0.71
PSST-Academic/Occupational	-5	4	0.14	-1.04
PSST-Overall	-19	4	-0.29	-0.92

Note: PSF = Perceived susceptibility to consequences compared to friend; PSST = Perceived susceptibility to consequences compared to typical student.

Table 3

Mean, Standard Deviation, and Reliability of Domain-specific and Overall Alcohol Consequences for Self, Close Same-sex Friend, and Typical Same-sex Student

Variable	*N*	α	*M*	*SD*
Self				
Social/Interpersonal Consequences	330	.78	2.02	1.83
Risk Behaviors Consequences	330	.81	1.86	2.10
Academic/Occupational Consequences	331	.80	.91	1.42
Self Total Consequences	325	.90	4.82	4.69
Friend				
Social/Interpersonal Consequences	327	.78	3.03	1.96
Risk Behaviors Consequences	324	.82	3.12	2.94
Academic/Occupational Consequences	327	.83	1.74	1.82
Friend Total Consequences	315	.91	7.86	5.54
Student				
Social/Interpersonal Consequences	325	.73	4.32	1.64
Risk Behaviors Consequences	323	.80	5.24	2.30
Academic/Occupational Consequences	325	.80	3.18	1.76
Student Total Consequences	310	.90	12.71	5.00

same period. According to a paired sample t-test, participants' experience of alcohol consequences was significantly lower (M_D = -3.17, SD = 5.25, 95% CI = [-3.76, -2.58]), than their close same-sex friend, $t(309) = -10.63, p < .001$. Participants' perceptions of the number of alcohol consequences experienced by their close same-sex friend was significantly lower (M_D = -4.96, SD = 5.54, 95% CI = [-5.60, -4.32]) than the number of alcohol consequences perceived to be experienced by the typical same-sex student, $t(293) = -15.34, p < .001$. Through these comparisons, it can also be assumed that, participants' experience of alcohol consequences was significantly lower (M_D = -7.89, SD = 5.85) than the typical same-sex students' perceived experience of consequences.

Self. Participants reported the most common consequences they experienced while drinking were saying or doing something embarrassing (68%), taking foolish risks (44%), doing impulsive things they later regretted (41%), and saying something they later regretted (41%). Participants reported the least common consequences experienced were getting in trouble at work or school (11%), injuring someone while drinking or intoxicated (12%), damaging property or doing something disruptive (12%), and neglecting to protect oneself or partner from an STD or unwanted pregnancy as a result of drinking (12%).

Friend. Participants perceived their closed friends' most common consequences while drinking were saying or doing something embarrassing (82%), taking foolish risks (63%), doing impulsive things they later regretted (56%), and saying things they later regretted (55%). Participants perceived that their same-sex friends' experienced the following consequences less frequently: injuring someone else while drinking or intoxicated (23%), getting in trouble at work or school because of drinking (26%),

neglecting to protect themselves or their partner from an STD or unwanted pregnancy as a result of drinking (27%), and getting into physical fights because of drinking (28%).

Typical student. Participants perceived the most common consequences the typical student experienced while drinking were saying or doing something embarrassing (94%), taking foolish risks (89%), doing impulsive things they later regretted (82%), and saying things they later regretted (82%). Participants perceived the typical same-sex student experienced the following consequences less frequently: injuring someone else while drinking or intoxicated (36%), having relatives or partner complain to them about their drinking (45%), getting into trouble at school or work because of drinking (52%), getting into physical fights because of drinking (55%), and neglecting to protect themselves or partner from an STD or unwanted pregnancy as a result of drinking (55%).

Participants reported that on average they used 9.12 protective behavioral strategies in the previous three months ($SD = 3.38$). Female emerging adults reported using significantly more protective behavioral strategies ($M = 9.61$, $SD = 3.30$) than the amount of strategies endorsed by male emerging adults ($M = 8.21$, $SD = 3.35$). Upon closer examination, the most common protective behavioral strategies endorsed by respondents were to "know where [their] own drink has been at all times" (89%), to "make sure [they] go home with a friend" (86%), and to "use a designated driver" (85%). The least common protective behavioral strategies endorsed by the respondents were to "avoid drinking shots of liquor" (26%), to "avoid drinking games" (38%), to "put extra ice in a drink" (41%), and to "have a friend let them know when they have had enough" (45%).

Male emerging adults (M = 10.91, SD = 7.62) reported consuming significantly more alcoholic beverages from Friday to Saturday than female emerging adults (M = 7.21, SD = 4.66). Male emerging adults reported similar experiences of social/interpersonal (M = 1.99, SD = 1.85), risk behavior (M = 2.13, SD = 2.38), and academic/occupational (M = .95, SD = 1.43) consequences compared to female emerging adults' number of social/interpersonal (M = 2.04, SD = 1.81), risk behavior (M = 1.67, SD = 1.93), and academic/occupational (M = .91, SD = 1.44) consequences. Emerging adults did not differ in perceived susceptibility by gender. Male emerging adults reported that their close same-sex friend experienced similar experiences of social/interpersonal (M = 2.93, SD = 1.97), risk behavior (M = 3.29, SD = 2.56), and academic/occupational (M = 1.67, SD = 1.73) consequences as compared to female emerging adults' perceptions of the number of social/interpersonal (M = 3.09, SD = 1.95), risk behavior (M = 3.05, SD = 2.49), and academic/occupational (M = 1.74, SD = 1.84) consequences their same-sex friend experienced. Male emerging adults reported that the typical same-sex student experienced similar experiences of social/interpersonal (M = 4.38, SD = 1.59), risk behavior (M = 5.22, SD = 2.12), and academic/occupational (M = 3.15, SD = 1.69) consequences as compared to female emerging adults' perceptions of the number of social/interpersonal (M = 4.31, SD = 1.70), risk behavior (M = 5.25, SD = 2.37), and academic/occupational (M = 3.25, SD = 1.78) consequences the typical same-sex student experienced. Male emerging adults reported similar levels of perceived susceptibility compared to close same-sex friend (M = -2.5, SD = 5.27) and typical same-sex student (M = -7.76, SD = 6.12) compared to female emerging adults' report of perceived

susceptibility compared to close same-sex friend (M = -3.40, SD = 5.13) and typical same-sex student (M = -8.20, SD = 5.73).

Model Specification

In order to examine the hypothesized relationships, particularly concerning perceived susceptibility of alcohol consequences for self compared to close same-sex friend and for self compared to typical same-sex student, the relationships were synthesized into an overall model. The model was composed of 10 directional paths of interest (see Figure 1).

Gender was included as a predictor of perceived susceptibility and protective behavioral strategies to determine whether gender differences existed. Each perceived susceptibility component had two paths: a direct path, represented by the thicker lines in the model, in which perceived susceptibility predicted alcohol consequences, and an indirect path through protective behavioral strategies, represented by a dashed line in the model. The direct path tested whether perceived susceptibility predicted alcohol consequences experienced by the participant, and whether comparison to the typical same-sex student was a better predictor than comparison to a same-sex close friend. The indirect path examined whether protective behaviors strategies served as a potential mediator of the participant's susceptibility to alcohol consequences as compared to a same-sex close friend and as compared to the typical same-sex student. Alcohol consumption was included as a correlate of perceived susceptibility due to the hypothesized direct relationship between the two variables. Alcohol consequences were controlled for amount of alcohol consumption. There were three separate models to control for the three target's alcohol consumption: 1) the participants' alcohol

consumption; 2) the perceived amount of alcohol consumed by their same-sex close same-sex friend; and 3) the perceived amount of alcohol consumed by the typical same-sex student at their university. See Figure 2 for an overview of these relationships in the specified model.

The specified model allowed for the three types of alcohol consequences experienced by the participant themselves (i.e., academic/occupational, social/interpersonal, and risk) to load on a general alcohol consequences latent variable (CONS). In addition, the model included two latent variables to represent perceived susceptibility: 1) the participant's perceived susceptibility compared to friend (PSF), and 2) the perceived susceptibility compared to the typical student (PSST). Again, these two overall perceived susceptibility latent variables were created from the difference scores between the participant's score on each of the three types of alcohol consequence scales and the target's (friend or student) score on each respective scale. For example, PSF was created from three indicator loadings: the difference scores between the participant and friend on the social/interpersonal, risk behaviors, and academic/occupational subscales. The same procedure was used to create the PSST latent variable.

Model Identification

After model specification and before path estimation, Kline (1998) states that it is necessary to establish model identification. In order to meet the condition of just-identified, there must be an equal number of unique covariances as parameters. If there are more parameters than unique covariances, then the model is classified as an under-identified model, which can cause problems in estimation (Kline, 1998; Mueller, 1996;

Schumacker & Lomax, 2004). Both just-identified and over-identified models are considered identified models (Schumacker & Lomax, 2004). The current models were

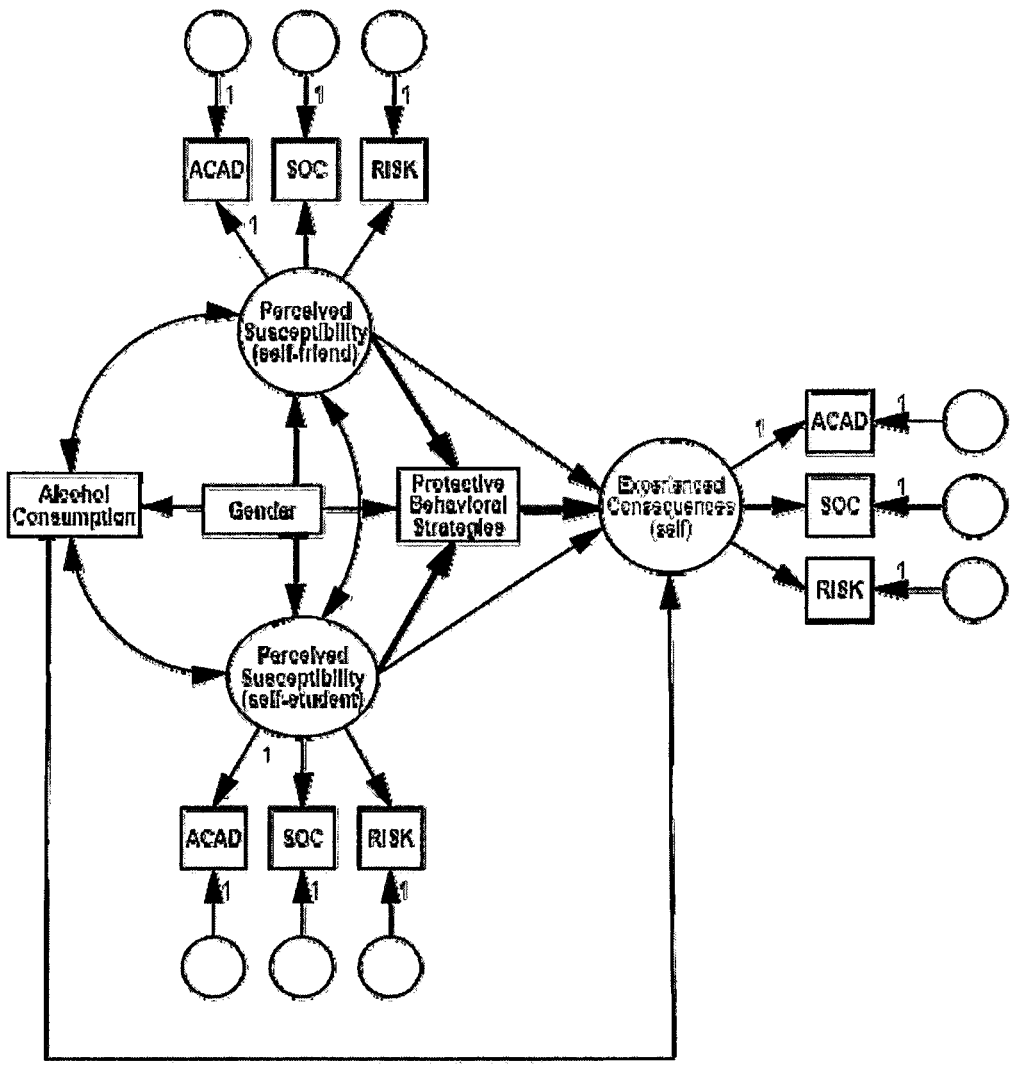

Figure 2. Specified Model with Latent Variables

classified as over-identified due to meeting the criterion of the order condition, in which fewer parameters were specified than the total number of unique covariances as demonstrated by positive degrees of freedom (Kline, 1998; Schumacker & Lomax, 2004). Model over-identification has been recognized to be ideal for theory development as it allows certain parameters to be freely estimated in order to find the best-fitting model (Kline, 1998). Kline (1998) states that over-identified models can be made more complex by building the model (i.e., adding more paths) but can also be trimmed, either of which should be done according to theoretical considerations rather than purely based on significance values.

Model Estimation

The model was replicated three times to control for the three target's alcohol consumption: 1) the participants' alcohol consumption; 2) the perceived amount of alcohol consumed by their same-sex close same-sex friend; and 3) the perceived amount of alcohol consumed by the typical same-sex student at their university. Model results are reported in the context of each of these three models.

The three initial models were tested through structural equation modeling (SEM) using the statistical software program Mplus 5.1 (Muthen & Muthen, 1998). Although all three models demonstrated strong path coefficients, overall there was poor model fit (all χ^2ranged from 684.53-696.82, df = 44 for all models and significant at $p < .001$, CFIs ranged from .68-.69, TLIs ranged from.52-.53, SRMR = .07 for all models, RMSEA = .21 for all models). See Table 4 for each specified model's overall fit statistics compared to baseline null model. Although the majority of specified relationships were strong, several weak and non-significant paths were subject to theory trimming and building

(Kline, 1998). Each of the three models was modified individually based on theoretical support, model fit indices, path coefficient magnitude, modification indices, and significance values. In all three models, several common paths were dropped and one path was added (see Table 5).

Table 4

Model Fit Indices Before Model Trimming/Building

Model	χ^2	*df*	*p*	CFI	TLI	SRMR	RMSEA	95% CI
Baseline Model 1	2140.19	66	.000					
Model 1 Controlling For Own Alcohol Use	688.71	44	.000	.689	.534	.068	.210	[.196, .224]
Baseline Model 2	2141.78	66	.000					
Model 2 Controlling For Friend's Alcohol Use	684.53	44	.000	.691	.537	.067	.209	[.195, .223]
Baseline Model 3	2113.97	66	.000					
Model 3 Controlling For Student's Alcohol Use	696.82	44	.000	.681	.522	.068	.211	[.197, .225]

Note. CFI = Comparative Fit Index; TLI = Tucker-Lewis Index; SRMR = Standardized Root Mean Square Residual; RMSEA = Root Mean Square Error of Approximation.

Female and male participants did not differ in their perceived susceptibility to negative alcohol consequences compared to close same-sex friend or typical same-sex student. Thus, the two paths with gender predicting perceived susceptibility to negative alcohol consequences (PSF and PSST) were dropped. Emerging adults' perceived susceptibility compared to a same-sex friend did not predict their use of protective behavioral strategies. Therefore, the path with perceived susceptibility compared to same-sex close friend (PSF) predicting protective behavioral strategies was dropped. An additional path from alcohol consumption to protective behavioral strategies was added based on the reasoning that participants that consumed lighter amounts of alcohol would be less likely to have a need for protective behavioral strategies which specifically attempt to limit heavy drinking. Alcohol consumption was re-specified to be a predictor, rather than a covariate, with perceived susceptibility compared to close same-sex friend and typical same-sex student, as it was believed that there would be a direct relationship between the amount of alcohol a student consumed and their perceived susceptibility such that the more alcohol consumed, the higher perceived susceptibility would be for participants. Interestingly, for the model controlling for perceived typical same-sex student's alcohol consumption, the two paths in which alcohol consumption was hypothesized to predict perceived susceptibility relative to same-sex close friend (PSF) and typical same-sex student (PSST) were dropped due to weak path coefficients. See Table 5 for modifications by model. These modifications reduced each models chi-square statistic (all models' χ^2 values ranged from 682.85 to 693.93, $df = 46$ to 48 and significant at $p < .001$), standardized root mean squared residual (SRMR = .07), and root mean squared error of approximation (RMSEA = .20), and additionally, improved each model's

Comparative Fit Index (CFIs =.69) and Tucker-Lewis Index (TLIs = .56 to .57). Although the models were improved, the overall fit statistics were comparatively low relative to the recommended values (CFI $\geq$ .90, TLI $\geq$ .90, SRMR $\leq$ .10, RMSEA $\leq$ .08) for a complex model and a small sample (Hu & Bentler, 1999; Kline, 1998; Sharma, Mukherjee, Kumar, & Dillon, 2005). More stringent criteria for good model fit identifies acceptable values of CFI and TLI to be equal or greater than .95 and acceptable values of SRMR and RMSEA to be equal or less than .08 (Kenny, 2010). Furthermore, modification indices revealed that specificity in the construct of perceived susceptibility would largely decreases in the chi-square statistics for each model and enhance overall model fit. Particularly, two changes were made. First, each type of consequence in the two perceived susceptibility latent variables were linked (i.e., PSF-ACAD with PSST-ACAD, PSF-SOC with PSST-SOC, and PSF-RISK with PSST-RISK). Second, each type of consequence in the two perceived susceptibility latent variables now predicted the respective subscale of the latent variable of consequences experienced by the participant as opposed to predicting overall, general consequences (i.e., PSF-ACAD and PSST-ACAD predicted CONS-ACAD, PSF-SOC and PSST-SOC predicted CONS-SOC, and PSF-RISK and PSST-RISK predicted CONS-RISK).

Table 5

Path Estimates and Model Modifications by Each Alcohol Consumption Model

Variable	*β*	*B*	*SE*	*p*
Controlling for Self Alcohol Consumption				
Gender →Self-Friend PS	0.026	0.057	0.132	.669
Gender →Self-Student PS	0.026	0.074	0.159	.643
Self-Friend PS → PBS	0.029	0.094	0.313	.764
Consumption →PBS*	-0.128	-0.070	0.030	.019
Controlling for Friend Alcohol Consumption				
Gender →Self-Friend PS	0.023	0.049	0.128	.701
Gender →Self-Student PS	0.025	0.071	0.158	.653
Self-Friend PS → PBS	0.046	0.153	0.314	.627
Consumption →PBS*	-0.087	-0.039	0.023	.090
Controlling for Student Alcohol Consumption				
Gender →Self-Friend PS	0.026	0.055	0.128	.665
Gender →Self-Student PS	0.024	0.068	0.160	.671
Self-Friend PS →PBS	0.026	0.084	0.317	.791
Consumption →Self-Friend PS	0.023	0.141	0.412	.733
Consumption →Self-Student PS	0.072	0.592	0.401	.140
Consumption → PBS*	-0.131	-0.071	0.032	.024

Note: Paths were dropped/added one at a time within each model. PS = Perceived Susceptibility. Consumption = Total Weekend Drinking. PBS = Protective Behavioral Strategies. * = Path added.

In addition to the results of the modification indices, which indicated strong paths in the model, the author reconsidered whether there was theoretical support for latent "perceived susceptibility" or "overall alcohol consequence" variables. The three subscales from the Young Adult Alcohol Consequences Questionnaire that assessed perceived susceptibility compared to a same-sex close friend and typical same-sex student and alcohol consequences experienced by the participant, were initially tested as part of a SEM model (i.e., all three YAACQ subscale summed scores loaded on alcohol consequences and difference scores loaded on perceived susceptibility latent variables). Therefore, a factor analysis was used to create latent variables for alcohol consequences (i.e., the dependent variable), and perceived susceptibility (compared to friend and student) in order to provide an arguably more parsimonious model structure. Although a latent variable resulted in a more parsimonious model (i.e., one that contains the fewest number of variables and paths), the interpretation of the model also became more generalized. Although in some circumstances parsimony is advantageous, in the case of the present study, latent variables (CONS, PSF, PSST) became so general that these general latent variables lost some interpretability. That is, there were important paths between specific forms of participants' perceptions of friends, and students' alcohol consequences that were related to one's own alcohol consequences, which necessitated the dissolution of the latent variables. For this reason, the latent variables (i.e., PSF, PSST, and CONS) were trifurcated in order to identify their respective indicators as observed variables. In other words, each of the three sets of indicators (i.e., three indicators each for PSF, PSST, and CONS) was specified as observed variables. See Figure 3 for the re-specified model. In order to provide a simple display of the more

essential model relationships, some paths were not pictured in the model: 1) alcohol consumption was a predictor of alcohol consequences experienced by the participants; 2) alcohol consumption was a correlate for PSF variables and PSST variables for the models including self alcohol consumption and perceived friends' alcohol consumption; 3) PSF variables were specified as correlated; 4) PSST variables were specified as correlated; and 5) consequence variables were specified as correlated. The re-specified model remained over-identified and there was sufficient power to test the model.

Path Analyses

The three models, trifurcated by consumer of alcohol (self, friend, and student), were then analyzed with path analyses. Each models' analyses were bootstrapped at 1000 replications in order to normalize distributions for skewed variables and provide more reliable standard errors and confidence intervals. Interpretation of the model results were more clear and precise when the participant's perceived susceptibility to a subtype of alcohol consequences was allowed to predict the same subtype of alcohol consequences actually experienced by the participant. This adaptation allowed for specificity of the three types of alcohol consequences and the results of the path analysis supported the importance of examining individual subscales as paths. In contrast to a general overall consequences latent variable, specific differences in types of alcohol consequences could now be examined and interpreted. See Table 6 for model fit indices across three models controlling for alcohol consumption (self, friend, and student).

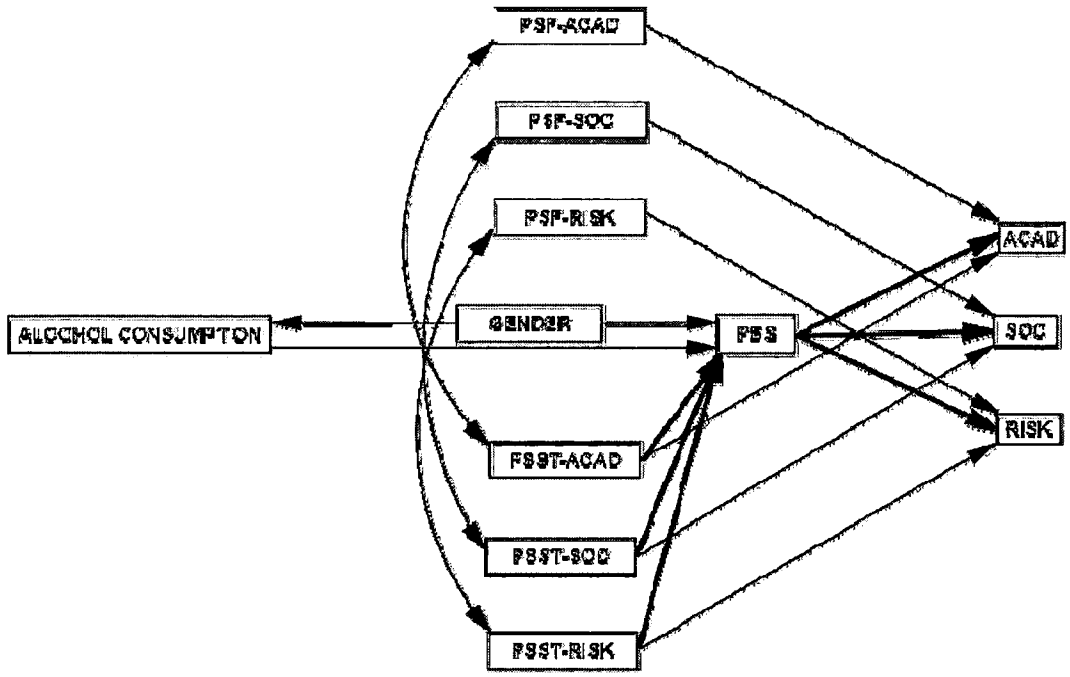

Figure 3. Re-specified Model

Note. PSF = Perceived susceptibility compared to friend; PSST = Perceived susceptibility compared to typical student. ACAD = Academic/Occupational alcohol consequences experienced by participants; SOC = Social/Interpersonal alcohol consequences experienced by participants; RISK = Risk behavior alcohol consequences experienced by participants. Several paths not pictured: 1) alcohol consumption was a predictor of alcohol consequences (ACAD, SOC, and RISK) experienced by the participants; 2) alcohol consumption was a predictor for PSF and PSST for the models including own and perceived friends' alcohol consumption; 3) PSF variables were specified as correlated; 4) PSST variables were specified as correlated; and 5) consequence variables (ACAD, SOC, and RISK) were specified as correlated.

Table 6

Final Model Overall Fit Indices After Model Trimming/Building

Model	χ^2	*df*	*p*	CFI	TLI	SRMR	RMSEA	95% CI
Baseline Model 1	2056.01	66	.000					
Model 1 Controlling For Own Alcohol Use	119.83	30	.000	.955	.901	.091	.095	[.077, .113]
Baseline Model 2	2033.08	66	.000					
Model 2 Controlling For Friend's Alcohol Use	129.13	30	.000	.950	.889	.106	.100	[.082, .118]
Baseline Model 3	1099.51	45	.000					
Model 3 Controlling For Student's Alcohol Use	57.79	30	.002	.974	.960	.043	.053	[.032, .073]

Note. CFI = Comparative Fit Index; TLI = Tucker-Lewis Index; SRMR = Standardized Root Mean Square Residual; RMSEA = Root Mean Square Error of Approximation.

Model 1

For the first model, controlling for the participants' own alcohol consumption, the overall model had good fit according to CFI = .95, TLI = .90, but less than optimal indices according to RMSEA = .10, and SRMR = .09. See Table 7 for path coefficients, and bootstrapped standard errors and 95% confidence intervals. The strongest predictors

of the participants' actual experience of social, risk behavior, and academic/occupational consequences were their perceived susceptibility compared to the typical same-sex student, βs = .40 to .47. Participants' own alcohol consumption (βs = .22 to .25) and perceived susceptibility compared to same-sex close friend (βs = .26 to .28), both predicted participants' experience of alcohol consequences. As established by previous literature, the more alcohol consumed by the participant, the more alcohol problems they reported. As perceived susceptibility compared to same-sex friend increases, the number of alcohol consequences experienced by the participant increased. The amount of alcohol consumed by the participants also significantly predicted their perceived susceptibility to alcohol consequences compared to the typical same-sex student (βs = .18-.26). This means that as the number of drinks consumed by the participant increased, their perceived susceptibility to consequences compared to the typical same-sex student increased as well. Holding other variables in the model constant, for every standard deviation unit increase in alcohol consumption, perceived susceptibility compared to a typical same-sex student increased by .18 to .26 standard deviation units, with the largest increase for risk behavior consequences. Alcohol consumption did not significantly predict perceived susceptibility compared to same-sex close friend (βs = .09-.11).

Protective behavioral strategies demonstrated the weakest paths predicting the three types of consequences. The first steps in mediation testing are to establish that the mediator is correlated with the initial variable and also the outcome variable (Baron & Kenny, 1986). The hypothesized role of protective behavioral strategies as a mediator was not established due to failure to meet criteria of mediation: a) protective behavioral strategies were not correlated with the perceived susceptibility compared to student

(PSST) variables (except for PSST-RISK); and b) protective behavioral strategies were not correlated with the specific subtypes of consequences (except for social consequences) experienced by the participants. Therefore, protective behavioral strategies did not appear to explain the relationship between specific types of perceived susceptibility and their prediction of the specific types of consequences experienced by participants.

Perceived susceptibility measures were strongly correlated by target, such that 1) the three scores of perceived susceptibility to social/interpersonal, risk behavior, and academic/occupational, alcohol consequences compared to their same-sex close friend (PSF-SOC, PSF-RISK, & PSF-RISK) were strongly correlated, $r = .39\text{-}.53$, $p < .001$; and 2) the three scores of perceived susceptibility to social/interpersonal, risk behavior, and academic/occupational alcohol consequences compared to the typical same-sex student (PSST-SOC, PSST-RISK, & PSST-ACAD) were strongly correlated, $r = .51\text{-}.63$, $p < .001$. These strong correlations by target provide support that the participant was able to distinguish a close same-sex friend from a typical same-sex student at their university. Additionally, the three variables of academic/occupational, risk behavior, and social/interpersonal alcohol consequences experienced by the participants were correlated ($r = .62\text{-}.75$, $p < .001$). Perceived susceptibility compared to same-sex close friend and typical same-sex student were also found to be correlated with type of alcohol consequence: 1) academic/occupational (PSF-ACAD and PSST-ACAD), $r = .26$, $p < .001$; 2) risk behavior (PSF-RISK and PSST-RISK), $r = .17$, $p < .001$; and 3) social/interpersonal (PSF-SOC and PSST-SOC), $r = .31$, $p < .001$. However, these correlations by type of consequences were not stronger than the correlations among

perceived susceptibility variables by target, which also show support for the respondents' ability to distinguish between targets. See Table 7 for path coefficients, and bootstrapped standard errors and 95% confidence intervals.

Table 7

Path Estimates with Bootstrapped SEs and CIs Controlling for Self Alcohol Consumption

Specified Path	*β*	B	SE	*p*	95% CI
Direct Paths					
PSF-SOC→SOC	.258	.223	.030	.000	[.165, .276]
PSST-SOC→SOC	.471	.411	.034	.000	[.342, .475]
PSF-RISK→RISK	.272	.250	.030	.000	[.190, .309]
PSST-RISK→RISK	.444	.360	.030	.000	[.300, .418]
PSF-ACAD→ACAD	.277	.228	.031	.000	[.167, .291]
PSST-ACAD→ACAD	.400	.299	.030	.000	[.235, .355]
Consumption→PSF-SOC	.111	.037	.020	.065	[-.001, .076]
Consumption→PSF-RISK	.102	.039	.021	.061	[.001, .083]
Consumption→PSF-ACAD	.085	.025	.016	.119	[-.006, .056]
Consumption→PSST-SOC	.179	.059	.017	.000	[.025, .093]
Consumption→PSST-RISK	.260	.113	.022	.000	[.069, .156]
Consumption→PSST-ACAD	.200	.064	.016	.000	[.033, .099]

Table 7 Continued

Specified Path	β	B	SE	p	95% CI
Consumption → PBS	-0.127	-0.070	.030	.018	[-.128, -.015]
Gender → Consumption	.295	3.771	.787	.000	[2.215, 5.298]
Gender →PBS	-0.136	-0.954	.427	.026	[-1.801, -.954]
Indirect Paths					
PSST-SOC →PBS	.085	.142	.114	.211	[-.081, .373]
PSST-RISK →PBS	-0.255	-0.323	.108	.003	[-.538, -.108]
PSST-ACAD →PBS	.043	.074	.124	.550	[-.168, .313]
PBS→SOC	.148	.077	.022	.000	[.034, .118]
PBS→RISK	.088	.056	.031	.070	[-.006, .117]
PBS→ACAD	.100	.044	.021	.036	[.002, .086]
Correlational Paths					
PSF-ACAD ↔ PSF-RISK	.499	2.069	.284	.000	[1.525, 2.616]
PSF-ACAD ↔ PSF-SOC	.391	1.402	.225	.000	[.972, 1.848]
PSF-SOC ↔ PSF-RISK	.532	2.495	.327	.000	[1.864, 3.140]
PSST-ACAD ↔ PSST-RISK	.581	2.871	.258	.000	[2.328, 3.331]
PSST-ACAD ↔ PSST-SOC	.511	1.940	.200	.000	[1.541, 2.326]
PSST-SOC ↔ PSST-RISK	.630	3.191	.292	.000	[2.585, 3.738]
PSF-SOC ↔ PSST-SOC	.312	1.240	.156	.000	[.910, 1.528]
PSF-RISK ↔ PSST-RISK	.171	1.018	.212	.000	[.596, 1.406]
PSF-ACAD ↔ PSST-ACAD	.260	.891	.154	.000	[.581, 1.181]

Table 7 Continued

Specified Path	β	B	SE	p	95% CI
SOC ↔ RISK	.752	1.566	.151	.000	[1.268, 1.847]
ACAD ↔ RISK	.654	1.233	.134	.000	[.967, 1.481]
ACAD ↔ SOC	.618	.913	.096	.000	[.724, 1.090]
Controlled Paths					
Consumption→SOC	.234	.067	.012	.000	[.045, .092]
Consumption→RISK	.249	.087	.015	.000	[.058, .116]
Consumption→ACAD	.217	.052	.012	.000	[.030, .077]

Note: PSF = Perceived susceptibility to consequences compared to friend; PSST = Perceived susceptibility to consequences compared to typical student. SOC = social/interpersonal consequences. RISK = risk behavior consequences. ACAD = academic/occupational consequences. Consumption = Total Weekend Drinking.

Model 2

For the second model, controlling for the participants perception of their same-sex close friend's alcohol consumption, the overall model had good fit, CFI = .95, but less than optimal indices as indicated by the TLI = .89, RMSEA = .10, and SRMR = .11 statistics. See Table 8 for path coefficients, and bootstrapped standard errors and 95% confidence intervals. Similar to the previous model, the strongest paths in the prediction of participants' experience of alcohol consequences were also perceived susceptibility to

alcohol consequences compared to the typical same-sex student (βs = .40 to .47). For every standard deviation unit increase in perceived susceptibility compared to a typical same-sex student, alcohol consequences experienced by the participant increases by .40 to .47 standard deviation units, holding all other variables in the model constant. The higher perceived susceptibility compared to typical same-sex student is, the more consequences reported by the participants. Similar to model one, perceived susceptibility to alcohol consequences compared to one's friend (βs = .29 to .30) and perceived amount of close same-sex friend's alcohol consumption (βs = .25 to .26) were predictors of alcohol consequences experienced by participants. As the respondent reported higher levels of perceived susceptibility compared to their friend or heavier drinking by their friend, the more alcohol consequences the respondent experienced. In particular, after holding all other variables in the model constant, for every standard deviation unit increase in alcohol consumption by their friend, participants' alcohol consequences increased by .25 to .26 standard deviation units. For every standard deviation unit increase in perceived susceptibility compared to same-sex close friend, alcohol consequences experienced by the participant increased by .29 to .30 standard deviation units after holding all other variables in the model constant. Perceived amount of alcohol consumed by same-sex close friend significantly predicted perceived susceptibility to risk behavior consequences compared to student (β = .14) and perceived susceptibility to social/interpersonal consequences compared to same-sex close friend (β = .10). Protective behavioral strategies remained the weakest predictor of participants' alcohol consequences (βs = .08 to .14), and as reported in Model 1, protective behavioral strategies failed to meet criteria of mediation. As determined in Model 1, the perceived

susceptibility measures remained correlated by target and by type of consequence. Additionally, the three types of consequences experienced by the participant remained correlated (r = .61 to .75, $p < .001$). See Table 8 for path coefficients, and bootstrapped standard errors and 95% confidence intervals.

Table 8

Path Estimates with Bootstrapped SEs and CIs Controlling for Friend's Perceived Alcohol Consumption

Specified Path	β	B	SE	p	95% CI
Direct Paths					
PSF-SOC→SOC	.286	.243	.031	.000	[.183, .300]
PSST-SOC→SOC	.470	.405	.034	.000	[.339, .467]
PSF-RISK→RISK	.293	.266	.030	.000	[.205, .326]
PSST-RISK→RISK	.455	.362	.030	.000	[.302, .362]
PSF-ACAD→ACAD	.295	.239	.031	.000	[.177, .303]
PSST-ACAD→ACAD	.403	.298	.030	.000	[.234, .352]
Consumption→PSF-SOC	-.133	-.035	.013	.008	[-.062, -.010]
Consumption→PSF-RISK	-.116	-.035	.021	.087	[0.081, .002]

Table 8 Continued

Specified Path	β	B	SE	p	95% CI
Consumption→PSF-ACAD	-.093	-.022	.015	.147	[-.053, .006]
Consumption→PSST-SOC	.102	.027	.015	.073	[.000, .060]
Consumption→PSST-RISK	.144	.050	.020	.014	[.012, .090]
Consumption→PSST-ACAD	.099	.025	.015	.082	[-.001, .056]
Consumption → PBS	-0.088	-0.039	.023	.089	[-.085, .005]
Gender → Consumption	.238	3.774	.847	.000	[2.095, 5.462]
Gender →PBS	-0.152	-1.065	.423	.012	[-1.903, -.261]
Indirect Paths					
PSST-SOC →PBS	.084	.142	.116	.222	[-.098, .380]
PSST-RISK →PBS	-0.268	-0.340	.108	.002	[-.555, -.119]
PSST-ACAD →PBS	.035	.061	.123	.623	[-.179, .291]
PBS→SOC	.140	.071	.022	.001	[.028, .114]
PBS→RISK	.079	.049	.031	.114	[-.013, .109]
PBS→ACAD	.093	.040	.021	.055	[-.002, .081]
Correlational Paths					
PSF-ACAD ↔ PSF-RISK	.494	2.034	.291	.000	[1.458, 2.600]
PSF-ACAD ↔ PSF-SOC	.386	1.337	.233	.000	[.942, 1.838]
PSF-SOC ↔ PSF-RISK	.523	2.432	.340	.000	[1.787, 3.097]
PSST-ACAD ↔ PSST-RISK	.593	3.029	.264	.000	[2.456, 3.490]

Table 8 Continued

Specified Path	β	B	SE	p	95% CI
PSST-ACAD ↔ PSST-SOC	.517	1.997	.206	.000	[1.597, 2.387]
PSST-SOC ↔ PSST-RISK	.630	3.271	.303	.000	[2.628, 3.837]
PSF-SOC ↔ PSST-SOC	.316	1.258	.159	.000	[.928, 1.551]
PSF-RISK ↔ PSST-RISK	.176	1.066	.220	.000	[.620, 1.472]
PSF-ACAD ↔ PSST-ACAD	.257	.889	.155	.000	[.578, 1.176]
SOC ↔ RISK	.751	1.545	.149	.000	[1.245, 1.825]
ACAD ↔ RISK	.650	1.215	.133	.000	[.941, 1.472]
ACAD ↔ SOC	.612	.888	.095	.000	[.695, 1.065]
Controlled Paths					
Consumption→SOC	.263	.059	.011	.000	[.040, .085]
Consumption→RISK	.264	.073	.014	.000	[.047, .104]
Consumption→ACAD	.248	.047	.009	.000	[.031, .066]

Note: PSF = Perceived susceptibility to consequences compared to friend; PSST = Perceived susceptibility to consequences compared to typical student. SOC = social/interpersonal consequences. RISK = risk behavior consequences. ACAD = academic/occupational consequences. Consumption = Total Weekend Drinking.

Model 3

For the third model, controlling for the participants perceptions of the typical student's alcohol consumption, the overall model had good fit (i.e., CFI = .97, TLI = .96,

RMSEA = .05, and SRMR = .04). See Table 9 for path coefficients, and bootstrapped standard errors and 95% confidence intervals. The strongest predictors remained perceived susceptibility compared to same-sex typical student(βs = .30 to .41). After holding other variables in model constant, for every standard deviation unit increase in perceived susceptibility compared to a typical same-sex student, alcohol consequences experienced by the participant increased by .30 to .41 standard deviation units. The higher perceived susceptibility compared to typical same-sex student, the more consequences reported by the participants. Interestingly, the perceived amount of alcohol consumed by the typical same-sex student did not significantly predict overall perceived susceptibility compared to close same-sex friend and typical same-sex student, which determined why these paths were dropped from the initial model. Similar to the previous models, the respondents' perception of the typical same-sex student's alcohol consumption (βs = .16 to .24), and perceived susceptibility compared to their same-sex close friend (βs = .26 to .28), similarly predicted alcohol consequences experienced by the participant. That is, as the respondent reported greater perceived susceptibility compared to the typical same-sex student, or heavier drinking by the typical same-sex student, the more alcohol consequences the respondent reported they had experienced in the previous three months. Protective behavioral strategies remained the weakest predictor of alcohol consequences experienced by the participants (βs = .08 to .14). As mentioned previously, protective behavioral strategies did not meet criteria for mediation. The perceived susceptibility measures remained correlated by target and by type of consequence. Additionally, the three types of consequences experienced by the participant remained correlated (r = .63 to .75, $p < .001$).

Table 9

Path Estimates with Bootstrapped SEs and CIs Controlling for Student's Perceived Alcohol Consumption

Specified Path	*β*	B	SE	*p*	95% CI
Direct Paths					
PSF-SOC→SOC	.265	.230	.029	.000	[.171, .281]
PSST-SOC→SOC	.488	.415	.033	.000	[.350, .479]
PSF-RISK→RISK	.278	.253	.030	.000	[.191, .311]
PSST-RISK→RISK	.458	.374	.030	.000	[.314, .430]
PSF-ACAD→ACAD	.281	.232	.031	.000	[.169, .295]
PSST-ACAD→ACAD	.414	.308	.030	.000	[.245, .362]
Consumption → PBS	-0.141	-0.076	.030	.011	[-.146, -.025]
Gender →Consumption	.223	2.878	.742	.000	[1.401, 4.278]
Gender →PBS	-0.140	-.981	.417	.019	[-1.806, -.174]
Indirect Paths					
PSST-SOC →PBS	.106	.168	.119	.159	[-.073, .412]
PSST-RISK →PBS	-.289	-0.361	.108	.001	[-.576, -.150]
PSST-ACAD →PBS	.034	.058	.123	.639	[-.183, .298]
PBS→SOC	.139	.075	.021	.000	[.033, .116]
PBS→RISK	.076	.050	.030	.098	[-.010, .108]
PBS→ACAD	.083	.037	.021	.075	[-.004, .077]

Table 9 Continued

Specified Path	β	B	SE	p	95% CI
Correlational Paths					
PSF-ACAD ↔ PSF-RISK	.519	2.247	.308	.000	[1.677, 2.842]
PSF-ACAD ↔ PSF-SOC	.426	1.588	.266	.000	[1.077, 2.118]
PSF-SOC ↔ PSF-RISK	.603	3.024	.369	.000	[2.313, 3.732]
PSST-ACAD ↔ PSST-RISK	.621	3.330	.263	.000	[2.796, 3.792]
PSST-ACAD ↔ PSST-SOC	.568	2.410	.216	.000	[1.986, 2.835]
PSST-SOC ↔ PSST-RISK	.708	4.044	.314	.000	[3.379, 4.609]
PSF-SOC ↔ PSST-SOC	.575	2.540	.262	.000	[2.025, 3.026]
PSF-RISK ↔ PSST-RISK	.460	2.982	.380	.000	[2.209, 3.724]
PSF-ACAD ↔ PSST-ACAD	.437	1.556	.207	.000	[1.171, 1.972]
SOC ↔ RISK	.757	1.588	.149	.000	[1.297, 1.874]
ACAD ↔ RISK	.668	1.300	.136	.000	[1.018, 1.562]
ACAD ↔ SOC	.631	.942	.097	.000	[.753, 1.126]
Controlled Paths					
Consumption→SOC	.241	.070	.011	.000	[.052, .094]
Consumption→RISK	.209	.074	.014	.000	[.051, .104]
Consumption→ACAD	.158	.038	.009	.000	[.022, .057]

Note: PSF = Perceived susceptibility to consequences compared to friend; PSST = Perceived susceptibility to consequences compared to typical student. SOC = social/interpersonal consequences. RISK = risk behavior consequences. ACAD = academic/occupational consequences. Consumption = Total Weekend Drinking.

Summary

Overview of the three models' results indicated that the hypotheses were partially supported. As predicted by the hypotheses: 1) participants reported typical same-sex students experienced significantly more alcohol consequences than their same-sex close friend, and participants reported experiencing significantly less consequences than their same-sex friend; and 2) perceived susceptibility compared to same-sex close friend and perceived susceptibility compared to typical same-sex student significantly predicted academic/occupational, risk behavior, and social/interpersonal alcohol-related consequences reported by the participants. Unexpectedly, perceived susceptibility compared to a typical same-sex student served as a better predictor of respondents' alcohol consequences relative to perceived susceptibility compared to a same-sex close friend. These results suggest that perceived susceptibility compared to the typical same-sex student explains more variance in alcohol consequences experienced by emerging adults.

Across all three models, perceived susceptibility to academic/occupational, risk behavior, and social/interpersonal alcohol-related consequences compared to the typical same-sex student was the strongest predictor of each type of alcohol consequence experienced by the participants. Across all three models, amount of alcohol consumed by the participant or the perceived amount of alcohol consumed by the participants' same-sex close friend or typical same-sex student, predicted alcohol consequences experienced by the participant, but this relationship was strongest when controlling for alcohol consumption by the participant.

Perception of same-sex friend's alcohol consumption predicted perceived their susceptibility to risk behavior consequences compared to typical same-sex student (PSST-RISK) and perceived susceptibility to social/interpersonal alcohol-related consequences compared to same-sex close friend (PSF-SOC). Participants' own alcohol consumption predicted their perceived susceptibility to academic/occupational, social/interpersonal, and risk behavior consequences compared to typical same-sex student (PSST-ACAD, PSST-SOC, and PSST-RISK). Perception of the typical student's alcohol consumption did not predict overall perceived susceptibility compared to same-sex close friend or typical same-sex student.

Across all three models, the perceived susceptibility measures were correlated by target (self, friend, and student) and by type of consequence (academic/occupation, social/interpersonal, risk behavior). Additionally, the three types of consequences experienced by the participant (ACAD, SOC, and RISK) were correlated across three models.

The hypothesis that perceived susceptibility, compared to either same-sex close friend or typical same-sex student, would vary by gender was not supported. Across all three models, the hypothesized meditational role of protective behavioral strategies on the relationship between the three perceived susceptibility compared to typical same-sex student variables and alcohol consequences experienced by the participants was not supported.

Comparison of the fit indices of all three models revealed that the best model fit was when controlling for participants' perceived amount of alcohol consumed by a typical same-sex student.

CHAPTER 4

DISCUSSION

Purpose

The main goal of the present study was to explore and build theoretical support for the construct of perceived susceptibility to the negative consequences of alcohol as a predictor of one's alcohol consequences. Although emerging adults often incorrectly overestimate others' alcohol consumption (Baer & Carney, 1993; Baer et al., 1991; Bosari & Carey, 2001; Mallet et al., 2009; Neighbors et al., 2006; Perkins et al., 2005), it has yet to be firmly established that emerging adults tend to overestimate the amount of alcohol consequences experienced by others as well. Perceptions of a same-sex friend's susceptibility to alcohol consequences and perceptions of a typical same-sex student's susceptibility to alcohol consequences were explored as related to respondents' reports of the consequences of their own alcohol use to examine differences based on the target of comparison (e.g., friend or student). In addition, the relationships between perceived susceptibility and other variables such as gender, protective behavioral strategies and alcohol consumption were investigated.

Although Ranby, Aiken, Gerend, and Erchull (2010) cautioned against the use of indirect perceived susceptibility measures (i.e., self absolute risk as compared to others' absolute risk), there were two critical differences in the current study's indirect perceived susceptibility measure. First, the current study employed the use of clear summed scores of dichotomous response scales (i.e., yes or no) instead of a Likert-type response scale (i.e., very less likely to much more likely) of which has been criticized for its ambiguity and reliance on the respondent to mentally compute difference scores (Biehl & Halpern-

Felsher, 2001). Second, the current study used five or six items for each indirect perceived susceptibility measure instead of only two items used in the Ranby et al. study. It is important to note that Ranby et al. (2010) tested indirect perceived susceptibility in the context of overall risk to breast cancer, osteoporosis and heart disease simultaneously. In contrast, the present study focused on the perceptions of the perceived susceptibility to three individually tested alcohol consequences domains (i.e., academic/occupational, social, and risk behavior). It is also important to note that Ranby et al. reported poor reliability of the indirect perceived susceptibility measure. This is in contrast to adequate reliability for perceived susceptibility for the subscales in the present study. Additionally, direct comparison for perceived susceptibility (i.e., compared to your friend, what is your risk?) was strongly positively correlated with indirect comparison for perceived susceptibility (Ranby et al., 2010). These important differences might explain the discrepancy between the earlier study by Ranby et al. (2010) study and the present study findings.

Summary of Major Findings

The hypothesized relationships were partially supported. Emerging adults (i.e., between the ages of 18 and 25 (inclusive), perceived their own risk was lower than a close same-sex friend's risk for negative alcohol consequences. Emerging adults also perceived their risk to alcohol consequences to be less than the typical same-sex college student's risk to alcohol consequences. That is, respondents' reported that their own experience of negative consequences of alcohol use was significantly lower than that of a their close same-sex friend and even less compared to the typical same-sex college student. Contrary to the hypothesized relationship, perceived susceptibility to alcohol

consequences compared to the typical same-sex student was found to be a better predictor of emerging adults' own experience of alcohol consequences than perceived susceptibility compared to one's close same-sex friend. This finding parallels previous literature that found students in a fraternity/sorority rated themselves and friends as experiencing similar levels of alcohol-related consequences, but reported that a typical member of their fraternity/sorority and the typical student at their college as experiencing significantly more alcohol-related consequences (Baer & Carney, 1993; Lee et al., 2010). This suggests, because friends' drinking behaviors may be similar to one's own drinking behaviors, it is not as powerful a predictor as the typical students' drinking behaviors. Contrary to Baer & Carney's findings (1993) with a similar sample size, emerging adults were found to perceive their close same-sex friends as experiencing more alcohol consequences than themselves. This discrepancy may be explained by membership in a sorority or fraternity, of which the sample from Baer and Carney were drawn. Perceived susceptibility to a typical same-sex college student was the strongest predictor in the model of the number of negative alcohol consequences emerging adults experienced.

Emerging adults' perceived susceptibility to alcohol consequences as compared to the typical same-sex student at their university was the strongest predictor of the number of alcohol consequences they had experienced in the previous three months. Their perceived susceptibility to alcohol consequences compared to same-sex close friend also predicted the number of alcohol consequences experienced by emerging adults, but had predictive power similar to alcohol consumption. This discrepancy between perceived susceptibility compared to close friend versus typical student might be explained by the familiarity or similarity of a friend's drinking habits and experience of consequences

compared to the unfamiliarity of an unknown typical student. Moreover, research has shown that college students overestimate the typical student's alcohol use compared to their friends (Baer & Carney, 1993). These results suggest that college students may estimate greater negative alcohol consequences for peers they do not know as compared to those that they do know. Emerging adults have been shown to overestimate the amount of alcohol a typical student consumes, and following this logic, emerging adults might expect the typical college student to experience a certain amount of alcohol consequences that match the amount of alcohol consumed.

Respondents' perception of the amount of alcohol consumed by the typical student did not predict their perceived susceptibility to the negative consequences of alcohol use. In other words, regardless of the amount of alcohol they believed that the typical student consumed, estimates of alcohol consumption by the typical student were not associated with respondents' reports of their perceived susceptibility to the consequences of alcohol use. Results of the present study did not support the hypothesis that respondents' alcohol consumption would predict their perceived susceptibility to alcohol consequences compared to close same-sex friend; however, it did predict their perceived susceptibility to all three domains of alcohol consequences compared to typical same-sex student. Emerging adults' perceptions of friends' alcohol consumption was associated with their perceived susceptibility to social/interpersonal alcohol consequences compared to friend and associated with perceived susceptibility to risk behavior consequences compared to typical same-sex student. As expected, respondents' own alcohol consumption predicted their experience of alcohol consequences across all three domains examined (i.e., academic, social, and risk behavior). Regardless of how much

alcohol emerging adults perceived their close same-sex friends or the typical same-sex student to consume, they reported being less susceptible to alcohol consequences compared to friends and typical students. However, the current study found that for every additional drink emerging adults perceive is the norm for their friend or for the typical student, they will experience a significant increase in their own alcohol consequences they experience. This is similar to previous research, which demonstrated for every additional drink students' perceive is the norm for the typical student, they will drink an additional half drink (Perkins et al., 2005).

The use of protective behavioral strategies was predicted to mediate the relationship between perceived susceptibility to alcohol consequences as compared to students and the alcohol consequences experienced by emerging adults; however, protective behavioral strategies did not mediate this relationship. Although protective behavioral strategies did not mediate the hypothesized relationships, an interesting relationship was found between protective behavioral strategies and reports of risk behavior consequences. Specifically, perceived susceptibility to risk behavior consequences predicted a negative relationship with protective behavioral strategies, which then predicted social/interpersonal consequences experienced by emerging adults. This exploratory finding could be interpreted as emerging adults who perceive they are more susceptible to risk behavior consequences than the typical student, but are less likely to use protective behavioral strategies. On the other hand, it could be interpreted as emerging adults who use few protective behavioral strategies, who then may perceive themselves to be more susceptible to risk behavior consequences than the typical student.

Although it was predicted that male emerging adults would report lower perceived susceptibility compared to their same-sex close friend and the typical same-sex student than female emerging adults, contrary to the hypothesis, perceived susceptibility to alcohol consequences did not differ by gender. In part, this may reflect the types of alcohol consequences examined. Specifically, the present study focused on perceived susceptibility to social/interpersonal, risk behavior, and academic/occupational alcohol consequences. It is possible that consequences in other areas may lead to gender differences in perceived susceptibility. Sugarman and colleagues (2009) found that women were more likely to experience physical consequences like passing out or getting hurt, whereas men were more likely to damage property or go to school drunk. For instance, considerable research has suggested that women experience negative health consequences, such as fatty liver, obesity, anemia, cardiovascular disease, anxiety and depression, from alcohol misuse more quickly than men (Grella & Joshi, 1999; Hernandez-Avila, Rounsaville, & Kranzler, 2004; Frezza et al., 1990). Perceived susceptibility has demonstrated gender differences in other health areas including risk for alcohol consequences (for adolescents), sexual consequences from alcohol use, smoking consequences, HIV/AIDs, and skin cancer (Ebomoyi, 2001; Lamanna, 2004; Randolph et al., 2009; SAMSHA, 2009). The specific types of alcohol consequences in the current study may not differ by gender, and thus perceived susceptibility would be less likely to differ by gender.

Limitations

The current study has contributed to the foundation for a new path of research in the field of alcohol; however, there were several limitations. Being a forerunner in the

investigation of perceived susceptibility of alcohol consequences resulted in conducting analyses in an exploratory nature. The use of difference scores instead of direct comparison were used in favor of being more psychometrically sound; however, drawbacks of difference scores have been identified and debated such as difference scores yielding conservative testing or the poor reliability of difference scores (Edwards, 2001). Due to the nature of risk perception research, one individual was asked to report for alcohol consequences for three targets: themselves, a close friend, and the typical student. In other areas of risk perception, such as tobacco research, researchers often ask respondents to directly compare their risk to that of another target and decide "how much" different or similar they are in terms of risk. However, this type of comparison has been criticized for being ambiguous (Biehl & Halpern-Felsher, 2001). That is, one participant's perception of "very much" can be different than another's interpretation. Although the method employed in the current study allows for clear and standardized interpretation (i.e., items were scored dichotomously, that is, "yes" or "no"), it is difficult to partial out variance explained via the actual perceived susceptibility differences or variance explained by measurement error due to the same individual reporting on three variables. However, indications of discriminant validity was supported by stronger correlations between perceived subscales by target (self, close same-sex friend, and typical same-sex student) and by type (academic/occupational, social/interpersonal, and risk behavior) compared to the possibility that all perceived susceptibility variables could have been highly intercorrelated. In other words, the varying associations between the various domain-specific alcohol consequences experienced by emerging adults seem to indicate that the relationships are not primarily due to measurement error.

Future Directions

Several potential directions of research stem from the current study, such as, the presence of an age effect in perceived susceptibility to alcohol consequences. In order to examine if age affects the level of perceived susceptibility, emerging adults should be compared to other populations such as adolescents and older adults. In addition, men and women did not report different levels of susceptibility to alcohol consequences in the three areas examined (i.e., social/interpersonal, academic/occupational, and risk behaviors); however, it is possible that gender differences in the associations examined may be present in other types of alcohol consequences not examined in the present study (e.g., physical health). Future studies should employ a multi-rater design in which participants invite a close friend to report their own alcohol use and susceptibility to alcohol consequences to examine perceived and actual susceptibility to risks of alcohol use. Although the process used to assess perceived susceptibility yielded adequate reliability, future research should examine whether this method of comparing one's own susceptibility to alcohol use as compared to others can be replicated in other populations, such as non-college student populations or differences by ethnicity, in order to provide better generalizability. Ideally, future research should examine convergent and discriminant validation of these perceived susceptibility measures, which would provide more sound conclusions. Furthermore, the indirect comparison (i.e., difference scores) approach for computing perceived susceptibility should be tested to determine whether this approach yields similar results across various measures of alcohol consequences. For instance, it is important to examine whether instruments such as the Rutgers Alcohol Problem Index (White & Labouvie, 1989), one of the most common measures of alcohol

consequences, would provide similar perceived susceptibility results as the YAACQ. Additionally, to rule out measurement error due to using the same measure to create a difference score and to measure an outcome variable, ideally, perceived susceptibility created using the YAACQ should predict other measures of alcohol consequences and replicate the current study's findings.

The decision to identify perceived susceptibility and alcohol consequences as observed variables instead of overall latent variables was made in order to provide specificity that is more important than parsimony at this exploratory stage. Additionally, the decomposition of the latent variables determined the interpretability of specific domains of perceived susceptibility to predict the parallel alcohol consequences instead of a general perceived susceptibility predicting overall alcohol consequences. However, as this line of research continues and turns more confirmatory, researchers should strive for parsimony. The debate between an overall perceived susceptibility to alcohol consequences compared to specific types of perceived susceptibility should weigh the implications for intervention programs for at-risk groups.

CHAPTER 5

CONCLUSIONS

Perceived susceptibility to alcohol consequences compared to typical same-sex student was demonstrated to not only to be a predictor of alcohol consequences experienced by emerging adults, but was found to be the strongest predictor in the model. Perceived susceptibility compared to same-sex close friends predicted alcohol consequences experienced by emerging adults equally as well as alcohol consumption. However, perceived susceptibility compared to the typical same-sex student may be more important for norm-based interventions. Perceived susceptibility to risk behavior consequences compared to the typical student was associated with a substantial increase in use of protective behavioral strategies. This study provided the exploratory groundwork for future research to improve and further research the unique explanatory power of perceived susceptibility and its relationship with other variables influential of alcohol use and consequences. The expansion of alcohol norms to include overestimation of others' alcohol consequences can provide insight and empirical support for intervention programs for emerging adults. Interventions could be tailored for students by their level of perceived susceptibility or by the specific type of alcohol consequence they for which they are at most risk.

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APPENDIX A

YAACQ-Self

Below is a list of things that sometimes happens to people either during, or after they have been drinking alcohol. Next to each item below, please mark an "X" in either the YES or NO column to indicate whether that item describes something that has happened to you **IN THE PAST THREE MONTHS.**

In the **PAST 3 MONTHS**

		NO	YES
1.	While drinking, I have said or done embarrassing things.		
2.	The quality of my work or schoolwork has suffered because of my drinking.		
3.	I have felt badly about myself because of my drinking.		
4.	I have driven a car when I knew I had too much to drink to drive safely.		
5.	I have had a hangover (headache, sick stomach) the morning after I had been drinking.		
6.	I have passed out from drinking.		
7.	I have taken foolish risks when I have been drinking.		
8.	I have felt very sick to my stomach or thrown up after drinking.		
9.	I have gotten into trouble at work or school because of drinking.		
10.	I often drank more than I originally had planned.		
11.	My drinking has created problems between myself and my boyfriend/girlfriend/spouse, parents, or other near relatives.		
12.	I have been unhappy because of my drinking.		
13.	I have gotten into physical fights because of drinking.		
14.	I have spent too much time drinking.		
15.	I have not gone to work or missed classes at school because of drinking, a hangover, or illness caused by drinking.		
16.	I have felt like I needed a drink after I'd gotten up (that is, before breakfast).		
17.	I have become very rude, obnoxious or insulting after drinking.		
18.	I have felt guilty about my drinking.		
19.	I have damaged property, or done something disruptive such as setting off a false fire alarm, or other things like that after I had been drinking.		
20.	Because of my drinking, I have not eaten properly.		
21.	I have been less physically active because of drinking.		
22.	I have had "the shakes" after stopping or cutting down on drinking (eg., hands shake so that coffee cup rattles in the saucer or have trouble lighting a cigarette).		

		NO	YES
23.	My boyfriend/girlfriend/spouse/parents have complained to me about my drinking.		
24.	I have woken up in an unexpected place after heavy drinking.		
25.	I have found that I needed larger amounts of alcohol to feel any effect, or that I could no longer get high or drunk on the amount that used to get me high or drunk.		
26.	As a result of drinking, I neglected to protect myself or my partner from a sexually transmitted disease (STD) or an unwanted pregnancy.		
27.	I have neglected my obligations to family, work, or school because of drinking.		
28.	I often have ended up drinking on nights when I had planned not to drink.		
29.	When drinking, I have done impulsive things that I regretted later.		
30.	I have often found it difficult to limit how much I drink.		
31.	My drinking has gotten me into sexual situations I later regretted.		
32.	I've not been able to remember large stretches of time while drinking heavily.		
33.	While drinking, I have said harsh or cruel things to someone.		
34.	Because of my drinking I have not slept properly.		
35.	My physical appearance has been harmed by my drinking.		
36.	I have said things while drinking that I later regretted.		
37.	I have awakened the day after drinking and found that I could not remember a part of the evening before.		
38.	I have been overweight because of drinking.		
39.	I haven't been as sharp mentally because of my drinking.		
40.	I have received a lower grade on an exam or paper than I ordinarily could have because of my drinking.		
41.	I have tried to quit drinking because I thought I was drinking too much.		
42.	I have felt anxious, agitated, or restless after stopping or cutting down on drinking.		
43.	I have not had as much time to pursue activities or recreation because of drinking.		
44.	I have injured someone else while drinking or intoxicated.		
45.	I often have thought about needing to cut down or stop drinking.		
46.	I have had less energy or felt tired because of my drinking.		
47.	I have had a blackout after drinking heavily (i.e., could not remember hours at a time).		
48.	Drinking has made me feel depressed or sad.		

YAACQ- Typical Same-Sex College Student

Below is a list of things that sometimes happens to people either during, or after they have been drinking alcohol. Next to each item below, please mark an "X" in either the YES or NO column to indicate whether that item describes something that has happened to a **TYPICAL SAME-SEX COLLEGE STUDENT IN THE PAST THREE MONTHS.**

In the **PAST 3 MONTHS**

		NO	YES
1.	While drinking, a typical student of my gender has said or done embarrassing things.		
2.	The quality of work or schoolwork of a typical student of my gender has suffered because of their drinking.		
3.	A typical student of my gender has felt badly about themself because of their drinking.		
4.	A typical student of my gender has driven a car when they knew they had too much to drink to drive safely.		
5.	A typical student of my gender has had a hangover (headache, sick stomach) the morning after they had been drinking.		
6.	A typical student of my gender has passed out from drinking.		
7.	A typical student of my gender has taken foolish risks when they have been drinking.		
8.	A typical student of my gender has felt very sick to their stomach or thrown up after drinking.		
9.	A typical student of my gender has gotten into trouble at work or school because of drinking.		
10.	A typical student of my gender often drank more than they originally had planned.		
11.	A typical same-sex student's drinking has created problems between them and their boyfriend/girlfriend/spouse, parents, or other near relatives.		
12.	A typical student of my gender has been unhappy because of their drinking.		
13.	A typical student of my gender has gotten into physical fights because of drinking.		
14.	A typical student of my gender has spent too much time drinking.		
15.	A typical student of my gender has not gone to work or missed classes at school because of drinking, a hangover, or illness caused by drinking.		
16.	A typical student of my gender has felt like they needed a drink after they'd gotten up (that is, before breakfast).		
17.	A typical student of my gender has become very rude, obnoxious or insulting after drinking.		

		NO	YES
18.	A typical student of my gender has felt guilty about their drinking.		
19.	A typical student of my gender has damaged property, or done something disruptive such as setting off a false fire alarm, or other things like that after they had been drinking.		
20.	Because of a typical same-sex student's drinking, they have not eaten properly.		
21.	A typical student of my gender has been less physically active because of drinking.		
22.	A typical student of my gender has had "the shakes" after stopping or cutting down on drinking (e.g., hands shake so that coffee cup rattles in the saucer or have trouble lighting a cigarette).		
23.	The boyfriend/girlfriend/spouse/parents of a typical student of my gender have complained to the student about their drinking.		
24.	A typical student of my gender has woken up in an unexpected place after heavy drinking.		
25.	The typical student of my gender has found that they needed larger amounts of alcohol to feel any effect, or that they could no longer get high or drunk on the amount that used to get them high or drunk.		
26.	As a result of drinking, a typical student of my gender has neglected to protect themselves or their partner from a sexually transmitted disease (STD) or an unwanted pregnancy.		
27.	A typical student of my gender has neglected their obligations to family, work, or school because of drinking.		
28.	A typical student of my gender has often have ended up drinking on nights when they had planned not to drink.		
29.	When drinking, a typical student of my gender has done impulsive things that they regretted later.		
30.	A typical student of my gender has often found it difficult to limit how much they drink.		
31.	A typical same-sex student's drinking has gotten them into sexual situations they later regretted.		
32.	A typical student of my gender has not been able to remember large stretches of time while drinking heavily.		
33.	While drinking, a typical student of my gender has said harsh or cruel things to someone.		
34.	Because of a typical same-sex student's drinking they have not slept properly.		
35.	A typical same-sex student's physical appearance has been harmed by their drinking.		
36.	A typical student of my gender has said things while drinking that they later regretted.		

		NO	YES
37.	A typical student of my gender has awakened the day after drinking and found that they could not remember a part of the evening before.		
38.	A typical student of my gender has been overweight because of drinking.		
39.	A typical student of my gender hasn't been as sharp mentally because of their drinking.		
40.	A typical student of my gender has received a lower grade on an exam or paper than they ordinarily could have because of their drinking.		
41.	A typical student of my gender has tried to quit drinking because they thought they were drinking too much.		
42.	A typical student of my gender has felt anxious, agitated, or restless after stopping or cutting down on drinking.		
43.	A typical student of my gender has not had as much time to pursue activities or recreation because of drinking.		
44.	A typical student of my gender has injured someone else while drinking or intoxicated.		
45.	A typical student of my gender often has thought about needing to cut down or stop drinking.		
46.	A typical student of my gender has had less energy or felt tired because of their drinking.		
47.	A typical student of my gender has had a blackout after drinking heavily (i.e., could not remember hours at a time).		
48.	Drinking has made a typical student of my gender feel depressed or sad.		

YAACQ- Close Same-Sex Friend

Below is a list of things that sometimes happens to people either during, or after they have been drinking alcohol. Next to each item below, please mark an "X" in either the YES or NO column to indicate whether that item describes something that you believe has happened to **THREE OF YOUR CLOSE SAME-SEX COLLEGE FRIENDS IN THE PAST THREE MONTHS.**

In the **PAST 3 MONTHS**

		NO	YES
1.	While drinking, my close same-sex friend has said or done embarrassing things.		
2.	The quality of my close same-sex friend's work or schoolwork has suffered because of their drinking.		
3.	My close same-sex friend has felt badly about themselves because of their drinking.		
4.	My close same-sex friend has driven a car when they knew they had too much to drink to drive safely.		
5.	My close same-sex friend has had a hangover (headache, sick stomach) the morning after they had been drinking.		
6.	My close same-sex friend has passed out from drinking.		
7.	My close same-sex friend has taken foolish risks when they have been drinking.		
8.	My close same-sex friend has felt very sick to my stomach or thrown up after drinking.		
9.	My close same-sex friend has gotten into trouble at work or school because of drinking.		
10.	My close same-sex friend often drank more than they originally had planned.		
11.	My close same-sex friend's drinking has created problems between themselves and their boyfriend/girlfriend/spouse, parents, or other near relatives.		
12.	My close same-sex friend has been unhappy because of their drinking.		
13.	My close same-sex friend has gotten into physical fights because of drinking.		
14.	My close same-sex friend has spent too much time drinking.		
15.	My close same-sex friend has not gone to work or missed classes at school because of drinking, a hangover, or illness caused by drinking.		
16.	My close same-sex friend has felt like they needed a drink after they'd gotten up (that is, before breakfast).		
17.	My close same-sex friend has become very rude, obnoxious or insulting after drinking.		
18.	My close same-sex friend has felt guilty about their drinking.		

		NO	YES
19.	My close same-sex friend has damaged property, or done something disruptive such as setting off a false fire alarm, or other things like that after they had been drinking.		
20.	Because of my close same-sex friend's drinking, they have not eaten properly.		
21.	My close same-sex friend has been less physically active because of drinking.		
22.	My close same-sex friend has had "the shakes" after stopping or cutting down on drinking (e.g., hands shake so that coffee cup rattles in the saucer or have trouble lighting a cigarette).		
23.	My close same-sex friend's boyfriend/girlfriend/spouse/parents have complained to my friends about my friend's drinking.		
24.	My close same-sex friend has woken up in an unexpected place after heavy drinking.		
25.	My close same-sex friend has found that they needed larger amounts of alcohol to feel any effect, or that they could no longer get high or drunk on the amount that used to get them high or drunk.		
26.	As a result of drinking, my close same-sex friend has neglected to protect themselves or their partner from a sexually transmitted disease (STD) or an unwanted pregnancy.		
27.	My close same-sex friend has neglected their obligations to family, work, or school because of drinking.		
28.	My close same-sex friend often has ended up drinking on nights when they had planned not to drink.		
29.	When drinking, My close same-sex friend has done impulsive things that they regretted later.		
30.	My close same-sex friend has often found it difficult to limit how much they drink.		
31.	My close same-sex friends' drinking has gotten themselves into sexual situations they later regretted.		
32.	My close same-sex friend has not been able to remember large stretches of time while drinking heavily.		
33.	While drinking, my close same-sex friend has said harsh or cruel things to someone.		
34.	Because of my close same-sex friends' drinking they have not slept properly.		
35.	My close same-sex friend's physical appearance has been harmed by their drinking.		

		NO	YES
37.	My close same-sex friend has awakened the day after drinking and found that they could not remember a part of the evening before.		
38.	My close same-sex friend has been overweight because of drinking.		
39.	My close same-sex friend hasn't been as sharp mentally because of their drinking.		
40.	My close same-sex friend has received a lower grade on an exam or paper than they ordinarily could have because of their drinking.		
41.	My close same-sex friend has tried to quit drinking because they thought they were drinking too much.		
42.	My close same-sex friend has felt anxious, agitated, or restless after stopping or cutting down on drinking.		
43.	My close same-sex friend has not had as much time to pursue activities or recreation because of drinking.		
44.	My close same-sex friend has injured someone else while drinking or intoxicated.		
45.	My close same-sex friends often have thought about needing to cut down or stop drinking.		
46.	My close same-sex friend has had less energy or felt tired because of their drinking.		
47.	My close same-sex friend has had a blackout after drinking heavily (i.e., could not remember hours at a time).		
48.	Drinking has made my close same-sex friends feel depressed or sad.		

APPENDIX B

Daily Drinking Questionnaire (DDQ)

Consider a **TYPICAL WEEK** during the **PAST THREE MONTHS**.

Please fill in a number for each day of the week indicating the **TYPICAL NUMBER OF DRINKS YOU** usually consume on that day, and the **TYPICAL NUMBER OF HOURS** you usually drink on that day.

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Number of Drinks							
Number of Hours							

APPENDIX C

Drinking Norms Rating Form (DNRF)

Consider a **TYPICAL WEEK** during the **PAST THREE MONTHS.** Please fill in a number for each day of the week indicating the **TYPICAL NUMBER OF DRINKS A TYPICAL ODU STUDENT OF YOUR GENDER** usually consumes on that day.

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Number of Drinks							
Number of Hours							

Consider a **TYPICAL WEEK** during the **PAST THREE MONTHS.** Please fill in a number for each day of the week indicating the **TYPICAL NUMBER OF DRINKS 3 OF YOUR CLOSE FRIENDS OF THE SAME GENDER** usually consumes on that day.

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Number of Drinks							
Number of Hours							

APPENDIX D

Protective Behavioral Strategies Survey (PBSS)

	NO	YES
1. Determine not to exceed a set no. of drinks		
2. Alternate alcoholic and nonalcoholic drinks		
3. Have a friend let you know when you've had enough		
4. Leave the bar/party at a predetermined time		
5. Stop drinking at a predetermined time		
6. Drink water while drinking alcohol		
7. Put extra ice in your drink		
8. Avoid drinking games		
9. Drink shots of liquor **(reverse scored)**		
10. Avoid mixing different types of alcohol		
11. Drink slowly, rather than gulp or chug		
12. Avoid trying to "keep up" or out-drink others		
13. Use a designated driver		
14. Make sure that you go home with a friend		
15. Know where your drink has been at all times		

APPENDIX E

Demographic Information

1 How old are you? _____

2 Are you male or female?

a. Male

b. Female

3 Your Race/Ethnicity (check one):

___ American Indian or Alaska

___ Asian

___ Black or African American

___ Hispanic or Latino

___ Native Hawaiian or Other Pacific Islander

___ White, non-Hispanic

___ Other: _____

4 What is your current year in college?

a. First-semester Freshman

b. Second-semester Freshman

c. First-semester Sophomore

d. Second-semester Sophomore

e. First-semester Junior

f. Second-semester Junior

g. First-semester Senior

h. Second-semester Senior

i. Post-baccalaureate Student taking additional courses

j. Graduate Student

5 Where do you live during the school year?

a. On-campus dormitory

b. Other university housing

c. Off-campus residence

d. Family's residence

6 Who do you currently live with?

a. Alone

b. Roommate(s)

c. Spouse or Partner

d. Family member(s)

7 Did you ever suspect that your mother had a drinking problem? YES NO

8 Does your mother still have a drinking problem? YES NO

9 If your mother had a drinking problem but no longer has a drinking problem, how old were you when she stopped drinking? _____

10 Did you ever suspect that your father had a drinking problem? YES NO

11 Does your father still have a drinking problem? YES NO

12 If your father had a drinking problem but no longer has a drinking problem, how old were you when he stopped drinking? _____

13 Think about your living arrangements while you were growing up. *Most of the time* while you were growing up, what adults did you live with? Please check the most accurate description:

Mother only
Father only
Mother and father
Mother and stepfather
Father and stepmother
Other (please specify): _____

14 If you did not live with both biological parents during your childhood, was your parent's alcohol use a factor?
___ Yes
___ No

15 What is the highest level of education your mother completed? (check one)
___ some high school
___ high school
___ some college
___ completed college (e.g., B.S., B.A.)
___ some courses toward a masters degree
___ completed masters degree (e.g., M.S., M.A., M.S.W.)
___ completed doctorate (Ph.D., M.D., J.D.,etc.)

16 What does your mother do for a living? _____(please be specific)

17 What is the highest level of education your father completed? (check one)
___ some high school
___ high school
___ some college
___ completed college (e.g., B.S., B.A.)
___ some courses toward a masters degree
___ completed masters degree (e.g., M.S., M.A., M.S.W.)
___ completed Ph.D., M.D., etc.

17 What does your father do for a living? _____ (please be specific)

19 GPA: Is this your first semester in college?
a. If yes, please indicate your overall high school GPA (in numeric form)?

_____

b. If you are NOT a first semester freshman, what was your overall GPA at the end of last semester?_____

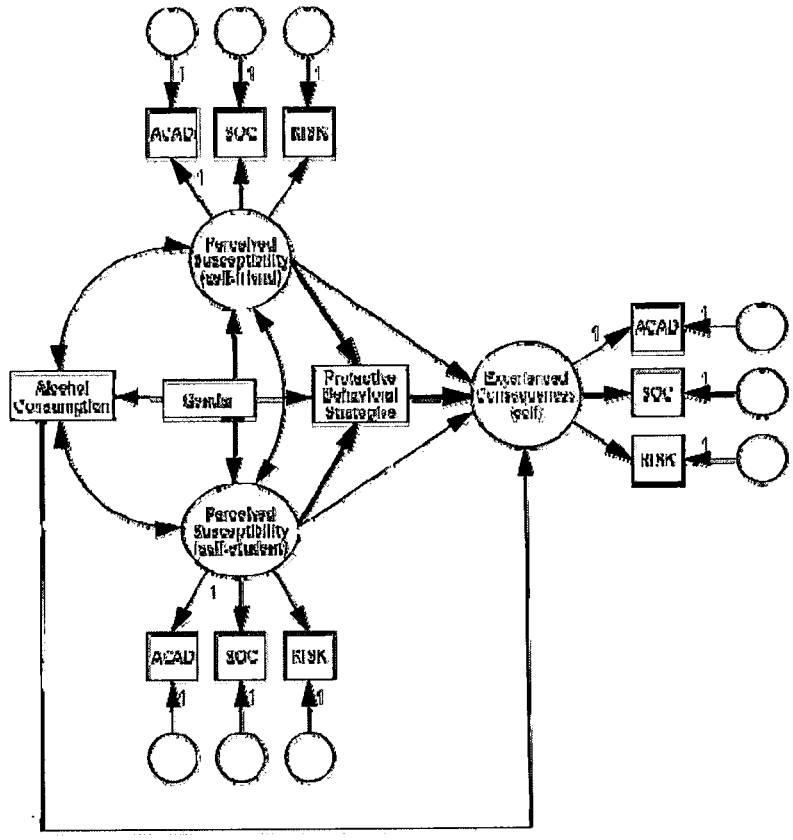
If anything in this survey has made you feel upset, please call the Counseling Center at ODU or visit their website.

Phone: (757) 683-4401

Website: http://studentaffairs.odu.edu/counseling/Appointment/index.shtml

APPENDIX F

Power Analysis



p = 12
1. Alcohol Consumption
2. Social (self-friend)
3. Risk (self-friend)
4. Ac/Occ (self-friend)
5. Social (self-student)
6. Risk (self-student)
7. Ac/Occ (self-student)
8. Social (self)
9. Risk (self)
10. Ac/Occ (self)
11. Gender
12. PBS

$\frac{12(11)}{2} = 66 + 12 = 78$

6 free factor loadings
10 structural paths
3 non-directional correlations
5 construct residual variances
9 indicator residual variances
33
78-33 = 45 *df*

Power Analysis- R Output

	armsea	rmseaa	d	n	powr
[1.]	0.05	0.05	0.01	45	270 0.7665321
[2,]	**0.05**	**0.05**	**0.01**	**45**	**285 0.8002508**
[3.]	0.05	0.05	0.01	45	300 0.8304684
[4.]	0.05	0.05	0.01	45	315 0.8572432

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Education

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B. A. in Psychology (2005-2009)
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George Mason University, Fairfax, VA

Professional Development

Graduate Teaching Assistant: Quantitative Methods, Head TA (Fall 2010, Spring 2011)
Old Dominion University, Norfolk, VA

SONA Research Participation Administrator (Fall 2009, Spring 2010, Summer 2010)
Old Dominion University, Norfolk, VA

Conference Paper Presentation

D'Lima, G. M., & Kelley, M. L. (2010, May). *For whom the bell tolls: Academic behaviors, self-regulation, & paced drinking in ACOA and non-ACOAs.* Paper presented at the annual Virginia Academy of Science Conference, Harrisonburg, VA.

Select Conference Poster Presentations

D'Lima, G. M., Pearson, M. R., & Kelley, M. L. (2011, August). *Self-regulation and alcohol-related problems among college students: Protective behavioral strategies as a mediator.* Poster session presented at the Annual American Psychological Association Convention, Washington D.C., DC.

D'Lima, G. M., Pearson, M. R., & Kelley, M. L. (2011, May). *The mediating and moderating effects of protective behavioral strategies in alcohol-related outcomes.* Poster session presented at the annual Association for Psychological Science Convention, Washington D.C., DC.