

ABSTRACT

Title of dissertation: THE INFLUENCE OF PARENTAL
COMMUNICATION ABOUT THE NEGATIVE
EFFECTS OF ALCOHOL ON COLLEGE
STUDENTS' ALCOHOL USE

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Many college students experience negative effects of excessive and underage drinking. Parental influences have been found capable of delaying adolescent drinking and reducing riskier adolescent drinking behaviors. However, there has been little investigation regarding the influence of parents on the drinking behaviors of college students while students are at school. A web-based survey was conducted with 265 University of Maryland first-year students who were 18-19 years old and living in residence halls. Focus groups (n=12), observed pre-tests and in-depth interviews (n=5), pilot tests (n=4), an alpha test, and expert review (n=5) were conducted to assist in the development of the web-based survey. It was hypothesized that: 1) students who report greater parental communication regarding the negative effects of alcohol are less likely to report problem drinking than students who report less communication, 2) the association between communication and problem drinking is mediated by constructs borrowed from the Theory of Reasoned Action (TRA), 3) the association between communication and problem drinking is mediated by

constructs borrowed from the Health Belief Model (HBM), 4) the association between communication and problem drinking is mediated by constructs borrowed from both the TRA and HBM, 5) the association between communication and problem drinking is best explained by the model incorporating constructs from both the TRA and the HBM. Logistic regression was conducted to test the first hypothesis. Path analysis and structural equation modeling were used to test hypotheses two through four. Models were qualitatively compared to test hypothesis five. Results of logistic regression indicated that there was no significant direct relationship between parent-child alcohol communication and problem drinking. Structural equation modeling revealed that the relationship between communication and problem drinking was mediated by attitude toward alcohol. Students whose parents talked with them more about the negative effects of alcohol held more favorable attitudes toward alcohol ($p = -0.13, p \leq 0.05$). In turn, students holding more favorable attitudes toward alcohol experienced more drinking problems ($p = 0.19, p \leq 0.05$). The TRA model was determined to be the model that best explained the relationship between communication and problem drinking. Possible explanations for unexpected findings are discussed.

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USE

by

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I) INTRODUCTION

1.1. Statement of the Problem

Alcohol use among college students is a problem of great concern. Adults aged 18-24 have the highest rates of alcohol use and alcohol related problems compared to any other age group. College students have higher rates of drinking than their non-college peers (Ham & Hope, 2003). Excessive drinking among college students affects the lives of the students themselves as well as the lives of those around them. Consequences of excessive drinking include unintentional injury, violence, unprotected sex, rape, academic problems, relationship problems, health problems, legal problems, and death (Ham & Hope, 2003; Hingson, Heeren, Zakocs, Kopstein, Wechsler, 2002; Engs, Diebold, Hansen, 1996; Presley, Meilman, Cashin, 1996; Presley, Meilman, Cashin, Lyster, 1996; Wechsler et al., 2002; Knight, Wechsler, Kuo, Seibring, Weitzman, Schuckit, 2002; Presley, Leichliter, Meilman, 1998). First year students are at higher risk than the rest of the college population for excessive drinking and alcohol problems. Freshmen tend to increase their consumption of alcohol over the course of the first year and report drinking more than they wanted or intended to drink as the first year progresses (Cavendish, 1991).

In Healthy People 2010 (HP2010), the Centers for Disease Control and Prevention (CDC) have set a national objective to reduce college student binge drinking by the year 2010. HP2010 objective 21-11b states, "Reduce the proportion of persons engaging in binge drinking of alcoholic beverages (US Department of Health and Human Services [DHHS], 1998)." The specific national objective is to reduce the proportion of

college students who binge drank in the last two weeks in 1998 (39%) to 20% in 2010 (DHHS, 1998).

There have been numerous efforts to identify modifiable factors that put college students at risk for binge drinking and to reduce rates of binge drinking among students. Factors that have been identified include demographic factors such as sex and ethnicity, personality factors, personal history, alcohol expectancies, drinking motivations, stress and coping, and peer influence. One factor that has received a great deal of attention in the adolescent drinking literature is parental influence. There is consistent evidence that, among adolescents, parental behaviors such as monitoring and communication are protective against alcohol use (Kafka & London, 1991; Beck, Boyle, Boekeloo, 2003; Lassey & Carlson, 1980; Komro et al., 2001; Cotrell et al., 2003; Borawski, Ievers-Landis, Lovegreen, Trapl, 2003; Alia et al., 2003; Raboteg-Saric, Rijavec, Brajsa-Zganec, 2001). However, there is little research on parental influence among college students. One reason for this is that college is often considered a time when students break away from their parents and a time in which parents have minimal influence. However, there are several reports that indicate that parents are highly involved in their children's plans and preparations for college and that parents maintain their influence even after their children have moved to college (Amerikaner, Monks, Wolfe, Thomas, 1994; Brack, Gay, Matheny, 1993; Galotti & Mark, 1994; Kashubeck & Christensen, 1995). Thus, it is possible that parents may play an important role in their children's decisions regarding alcohol even after students have moved off to college.

The few studies that do examine parental influence on college student drinking evaluate the impact of pre-college parental influence (Turrisi, Wiersman, Kelli, 2000;

Turrisi, Jaccard, Taki, Dunnam, Grimes, 2001). To date, no identified studies have investigated the possible influence that parents may have on students through communication about the negative consequences of alcohol use *while* students are away at school. Furthermore, the mechanisms through which this communication may work remain unknown.

1.2. Specific Aims

The specific aims of this investigation were to:

1. Create a web-based survey to assess the impact of students' perceptions of parental communication regarding the negative effects of alcohol on students' problem drinking.
2. Conduct developmental activities such as focus groups, observed pre-tests with in-depth interviews, a pilot test, and expert review to refine the survey.
3. Implement the survey with a randomly invited sample of first year students who reside in University residence halls.
4. Examine whether students' perceptions of post-matriculation parental communication regarding the negative consequences of alcohol use is protective against problem drinking.

5. Compare three models using constructs borrowed from the Theory of Reasoned Action (TRA) and constructs borrowed from the Health Belief Model (HBM) to determine which model best explains the relationship between perceived parental communication and problem drinking.

1.3. Hypotheses

The following hypotheses were tested:

Hypothesis 1: Students' perceptions of post-matriculation parent-child communication regarding the negative effects of alcohol use (as measured by a communication scale primarily concerned with discussion of these effects) are protective against problem drinking among first year college students.

Hypothesis 2: The relationship between students' perceptions of parent-child communication and problem drinking are mediated by parental subjective norms and attitudes toward drinking (constructs borrowed from the TRA).

Hypothesis 3: The relationship between students' perceptions of parent-child communication and problem drinking are mediated by perceived risk, operationalized as perceived susceptibility and perceived severity (constructs borrowed from the HBM).

Hypothesis 4: The relationship between students' perceptions of parent-child communication and problem drinking are mediated by parental subjective norms,

attitudes towards drinking, and perceived risk (an additive model using constructs borrowed from both the TRA and the HBM).

Hypothesis 5: The relationship between students' perceptions of parent-child communication and problem drinking are best explained by the additive path model utilizing constructs borrowed from both the TRA and the HBM.

1.4. Significance of the Study

This study adds to the knowledge base that can be used to help inform alcohol prevention efforts at campuses nationwide. Furthermore, this study helps develop theory as it tests the mechanism through which parent-student communication works to reduce drinking using constructs from two theoretical frameworks (the HBM and the TRA). Thus, interventionists will be informed of the mechanism through which communication works and could develop interventions accordingly. Admittedly, this is only one, cross sectional, survey study and more investigations will need to be conducted before results call for interventions, but findings from this study can help inform future studies and add to the literature on college drinking and theory.

1.5. Definition of Terms

Problem Drinking: Drinking that results in negative consequence such as missing class, damaging property, getting involved in regrettable sexual situations, experiencing hangovers, blackouts, or driving while intoxicated.

Attitude toward Drinking: Whether or not an individual views drinking in generally positive or negative terms (Williams & Hine, 2002).

Parental Subjective Norm: An individual's expectancies about whether her/his mother or father would react favorably or unfavorably if the individual drinks alcohol and the individual's motivation to comply with those expectancies (Glanz, Rimer, Lewis, 2002; Williams & Hine, 2002).

Perceived Risk: An individual's perception of her/his susceptibility to the negative consequences of drinking and the severity of those consequences.

Parent-Child Communication: Students' perceptions of the verbal communication (discussion) between themselves and their parent regarding the negative effects of alcohol use.

Parent: A biological mother or father. Also includes any female or male figure students consider to be a parental figure (e.g. step mother, guardian).

II) LITERATURE REVIEW

2.1. College Students and Alcohol Use

Alcohol use among college students is of great concern. Although problematic alcohol use occurs across many age groups, young adults aged 18–24 years show the highest rates of alcohol use and have the greatest percentage of problem drinkers (Ham & Hope, 2003). College student drinkers also differ from individuals of the same age that do not attend college. During high school, college bound individuals drink less than their non-college bound peers. However, once in college, 18-24 year old students consume greater amounts of alcohol than those who do not attend college (Ham & Hope, 2003).

There are three major, national studies of college student drinking. These are the Monitoring the Future Study (MTF), the 1995 National College Health Risk Behavior Survey (NCHRBS), and the Harvard School of Public Health College Alcohol Study (HAS). The MTF found that during the 1990s over 80% of students consumed alcohol over the last year (Johnston, O'Malley, Bachman, 2000). The NCHRBS found that 90% of college students had at least one drink of alcohol during their lifetime and that 68% of college students had at least one drink of alcohol during the past 30 days preceding the survey (Centers for Disease Control [CDC], 1997).

While lifetime and current drinking (drinking in the past 30 days or during the past year) may be an indicator of exposure to alcohol the measures most often used to capture risky drinking are indicators of binge drinking. Binge drinking is defined as five or more standard drinks for men and four or more standard drinks for women in one sitting (Wechsler, Dowdall, Davenport, Castillo, 1995a). In general, most national

studies indicate that two in five students are binge drinkers (Ham & Hope, 2003). The MTF study found that about 84% of college students reported a heavy drinking or “binge drinking” episode within the previous 90 days and 44% reported binge drinking in the previous 2 weeks (Vik, Carrello, Tate, Field, 2000; Wechsler & Kuo, 2000). The 1995 NCHRBS found that more than one third (35%) of college students had five or more drinks in a row on at least one occasion during the 30 days preceding the survey. In general, the NCHRBS found that bingeing as well as lifetime and current drinking behaviors were more common among males, students 18-24, White students, and students attending four year institutions than among females, students aged 25 and older, Black students and students attending two year institutions (CDC, 1997). Finally the HAS found that while the median number of drinks consumed by a random sample of students from 140 4-year colleges across the United States was 1.5 drinks per week with a mean of 5 drinks per week, binge drinkers consumed a median of 14.5 drinks per week. In this sample, binge drinkers represented less than half of the college population (44%) but drank 91% of the alcohol consumed by all college students (Ham & Hope, 2003).

College drinking is a public health concern because of the many effects the behavior can have on the lives of drinkers and those around them. Each year 1,400 students, ages 18-24 die from alcohol related unintentional injuries including motor vehicle crashes (Hingson et al., 2002). Five hundred thousand students per year, ages 18-24, are unintentionally injured under the influence of alcohol (Hingson et al.). Four hundred thousand students had unprotected sex and more than 100,000 students reported being too intoxicated to know if they consented to having sex (Hingson et al.). About 25% of college students report academic problems (missed classes, falling behind, doing

poorly on exams or papers, receiving lower grades) are a consequence of their drinking (Engs et al., 1996; Presley et al., 1996a, Presley et al., 1996b; Wechsler et al., 2002).

Excessive drinking has also been associated with health problems, suicide attempts, and drunk driving among students. More than 150,000 students nationwide develop an alcohol related health problem (Hingson et al.). A 2002 report found that 31% of students met criteria for the diagnosis of alcohol abuse and 6% of students met the criteria for alcohol dependence (self-reported drinking habits) (Knight et al., 2002).

About one and a half percent of students indicate that they tried to commit suicide in the past year due to drinking or drug use (Presley et al., 1998). According to a 2002 report, approximately two million students reported driving under the influence of alcohol during the past year (Hingson et al.). Alcohol-related accidents represent the leading cause of death in young adults aged 17–24 (Ham & Hope, 2003). Finally, student drinking is related to destructive behavior and police involvement. About 11% of students report that they have damaged property while under the influence of alcohol. Five percent of four-year college students are involved with the police or campus security as a result of their drinking (Wechsler et al., 2002) and every year an estimated 110,000 students are arrested for alcohol related violations (e.g. public drunkenness or driving under the influence) (Hingson et al.).

While these dramatic effects of alcohol are often widely publicized, there are other consequences of heavy drinking, particularly bingeing, that are sometimes overlooked. These include hangovers, engaging in behaviors later regretted, blacking out (forgetting where one is or what one did), arguing with friends, and requiring medical treatment for an alcohol overdose (Wechsler, Isaac, Grodstein, Sellers, 1994). In

addition, heavy drinking also lowers immunity and decreases physical health. Evidence suggests that heavy alcohol consumption in college students contributes to lowered resistance to common illnesses (e.g., upper respiratory infections) (Engs & Aldo-Benson, 1995).

Excessive drinking not only affects the drinker but it also affects those around him/her. On campuses where more than half of the students participate in binge drinking, 87% of students that live on campus have experienced some “secondhand effects” of that bingeing. This trend is also true, but at a lesser extent, at schools where less than one third of students participate in binge drinking (Wechsler et al., 1995a). Some of the most common secondhand effects of binge drinking include being insulted or humiliated, experiencing unwanted sexual advances, having interrupted sleep, and “baby-sitting” friends or roommates. According to Hingson et al. (2002), every year more than 600,000 students are assaulted by students who have been drinking. That report also indicated that more than 70,000 students are victims of alcohol related sexual assault or date rape (Hingson et al., 2002).

Students who have not yet experienced any alcohol related problems are still in danger of experiencing problems in the future. Study findings indicate that alcohol-related problems progress along a continuum (Vik et al., 2000), beginning with greater rates of the more common, relatively less problematic behaviors (i.e., “careless behaviors” such as missing class or getting injured) to more extreme, less frequent behaviors (i.e., “problems with authorities” such as arrests resulting from drinking). Thus, even heavy drinkers who have not experienced problems or experienced

minor problems are not immune to experiencing more frequent and/or severe alcohol-related difficulties in the future (Ham & Hope, 2003).

As college student drinking continues to be a significant public health problem, Healthy People 2010 Objectives have incorporated goals to reduce drinking to be achieved by the year 2010. Specifically, HP2010 objective 21-11b is to, “Reduce the proportion of persons engaging in binge drinking of alcoholic beverages (DHHS, 1998).” The specific national objective is to reduce the proportion of college students who binge drank in the last two weeks in 1998 (39%) to 20% in 2010 (DHHS, 1998).

2.2. Defining Problem Drinking for College Students

Problem drinking among college students has generally been defined in one of two ways: by drinking rates or by the occurrence of negative alcohol related consequences (Ham & Hope, 2003). Defining problem drinking by drinking rates or levels is justified in that more frequent binge drinking has been associated with greater alcohol-related problems (Ham & Hope, 2003). As described above, binge drinking is currently defined as the consumption of at least 5 consecutive standard drinks in one sitting for men and 4 consecutive standard drinks in one sitting for women (Wechsler et al., 1995a). A standard drink is usually defined as a 12-oz beer, a 4-oz glass of wine, a 12-oz wine cooler, or a 1.25-oz shot of liquor either straight or in a mixed drink (Wechsler, Lee, Kuo, Lee, 2000). This definition of bingeing has been criticized because it does not account for the drinker’s weight or drinking history, whether or not any food was consumed during the drinking episode, or the time period over which the alcohol was consumed. Furthermore, critics argue that the definition does not conform to the clinical measures of binge drinking, which refers to an intermittent yet prolonged episode of

alcohol abuse (DeJong, 2003). Different time frames in which to capture bingeing have been employed including within the previous 2 weeks, or the “typical” day or week of drinking. Some studies have asked students to monitor their drinking for a specific period of time. In addition, frequency of binge drinking is often examined. For instance, Wechsler et al. (2000) defined “frequent binge drinkers” as those who had binged three times in the past two weeks (or more than once per week on average), “occasional binge drinkers” as those who had binged 1 or 2 times in the previous 2 weeks, “non binge drinkers” as those who had consumed alcohol in the past year but had not binged in the past 2 weeks, and “abstainers” as those who had consumed no alcohol in the past year (Wechsler et al., 2000). A recent review of the literature (Ham & Hope, 2003) asserted that the frequency of binge drinking is potentially an important component of “problem drinking” in college students (Ham & Hope, 2003).

The argument has been made that the quantity and frequency measures of alcohol use are not sufficient to determine the problem status of college student drinkers (Ham & Hope, 2003). For instance, some heavy drinkers may have few to no alcohol related problems or some light or moderate drinkers may experience many alcohol-related problems (Ham & Hope, 2003). Because most of the concern regarding college student drinking is centered around negative consequences, it has been argued that the definition of problem drinking being the occurrence of problems is the most relevant definition. (Ham & Hope, 2003). However, because frequent binge drinkers experience alcohol-related problems more than other types of students (Wechsler et al., 2000), the frequency of bingeing also appears to be important.

Several indices have been used in previous research to determine the presence of alcohol problems among college students. These include the Rutgers Alcohol Problems Inventory (RAPI), the College Alcohol Problems Scale (CAPS) (O'Hare, 1997), and the Young Adult Alcohol Problems Screening Test (YAAPST) (Hurlbut & Sher, 1992).

The RAPI includes nearly all DSM-III-R criteria for an alcohol-related diagnosis. DSM diagnostic criteria involve many of the negative consequences that are used in research investigating alcohol-related problems in college students (e.g. substance-related legal problems, alcohol use in situations in which it is physically hazardous such as while driving, and alcohol-related absences from work or school) (Ham & Hope, 2003). However, the use of the DSM diagnostic criteria for alcohol dependence should be used with caution in college populations, as alcohol dependence criteria may not be appropriate to the special circumstances of adolescents and college-aged individuals (Ham & Hope, 2003).

While definite cut-off scores on these tests indicating problem drinking have not been well established, some investigators have developed combined indicators of problem drinking. For example, Thombs and Beck (1994) provided definitions of four categories of drinkers based on a combination of alcohol-related problems and quantity/frequency measures (Thombs & Beck, 1994). The most severe group ("high-consequence drinkers") was defined by cutoff score of >15 on the RAPI. The other three groups ("light drinkers," "moderate drinkers," and "heavy drinkers") were defined by a score of less than or equal to 15 on the RAPI and different levels of drinking frequency and quantity (Thombs & Beck, 1994). Similarly, Baer, Kivlahan, Blume, McKnight, and Marlatt (2001) defined high-risk drinking as a combination of drinking quantity and

frequency (5–6 drinks at least once in the past month) and negative consequences (at least three negative consequences 3–5 times in the previous 3 years based on the RAPI) (Baer, Kivlahan, Blume, McKnight, Marlatt, 2001).

Ham and Hope's (2003) recent review of the literature defines problematic alcohol use as heavy alcohol use (i.e., binge drinking) and/or high levels of alcohol-related negative consequences (Ham & Hope, 2003). The authors of this review recommend that, ideally, problem drinking should take into consideration both alcohol use quantity and frequency as well as alcohol-related negative consequences (Ham & Hope, 2003).

2.3. Freshmen and Alcohol Risk

Freshmen college students often take disproportionate risks compared with the rest of the student body. Freshmen tend to increase their consumption of alcohol over the course of the first year and report drinking more than they wanted or intended to drink as the first year progresses (Cavendish, 1991). Cavendish (1991) found that more second semester freshmen rated themselves as having a problem with alcohol than did first semester freshmen (Cavendish, 1991). Friend and Koushki (1984) found evidence that the college environment exerts a relatively rapid influence on newly entering freshmen that then leads to stability in substance use over the course of the college career (Friend & Koushki, 1984). While freshmen are typically under the legal drinking age (21), they still consume alcohol. Data from the 2001 and the three previous Harvard School of Public Health College Alcohol Studies indicate that while underage students drink alcohol less often, when they do drink they are more likely to drink to excess compared to of-age drinkers. Furthermore, half of underage students obtained alcohol very easily (Wechsler

et al., 2002). Throughout the later years in college and following college, students often show a gradual reduction in alcohol consumption. This phenomenon is often referred to as “maturing out” or “developmentally limited alcoholism (Ham & Hope, 2003).”

2.4. Factors Associated with College Students’ Problem Drinking

Several factors have been found to be associated with college students’ problem drinking. These include demographic factors, involvement in activities, personality factors, drinking history, alcohol expectancies, drinking motives, and stress and coping. Each of these are reviewed below.

2.4.1. Demographic Factors

Sex and ethnicity are correlated with college student drinking. Men drink alcohol more frequently and in larger quantities than women. Men are more likely to engage in binge drinking (Wechsler et al., 1994; Wechsler, Dowdall, Davenport, Rimm, 1995b) or risky drinking (Hill & Chow, 2002) and they are more likely to meet criteria for an alcohol use disorder (Clements, 1999; Hill & Chow, 2002). Men also tend to experience more “outward” alcohol related consequences than do women such as public deviance. However, women appear to experience more personal alcohol related consequences (e.g. poor academic performance, unintended sexual activity) (Perkins, 2002). Conversely, women tend to drink more during their freshman year while male students tend to engage in frequent, heavy episodic drinking more during their sophomore, junior, and senior years (McCabe, Boyd, Couper, Crawford, D’Arcy, 2002).

Anglo American students tend to drink more and experience more consequences of drinking than do other ethnic groups (Wechsler et al., 1995a). African American students tend to report the lowest drinking rates and drinking consequences while Hispanic Americans report intermediate rates and consequences (O'Malley & Johnston, 2002). Limited numbers of studies include Native Americans, but those that have report Native Americans experiencing rates of consequences similar to that of Anglo Americans and Asian Americans experiencing consequences in rates similar to African Americans (Presley et al., 1996a).

2.4.2. Involvement in Activities

Involvement in certain college activities such as academics, athletics, Greek life (fraternities or sororities), and religious organizations appear to be associated with drinking behaviors. There have not been any longitudinal studies that assess the causal linkage between poor academic performance and problem drinking (Ham & Hope, 2003). Therefore, it is not possible to determine which factor drives the other. However, there is a linkage between problem drinking and academic performance with those students who perform better in academics being less likely to report drinking problems (Ham & Hope, 2003).

Students involved in athletics are also more likely to drink more, binge drink, and report alcohol related risk behaviors than non athletes (Hildebrand, Johnson, Bogle, 2001). It has also been found that college athletes drink more frequently and experience more negative consequences of drinking than non college athletes (Leichliter, Meilman, Presley, Cashin, 1998).

Students who participate in Greek life tend to drink more heavily, drink more frequently and experience more negative alcohol related consequences than students who do not participated in Greek life (Cashin, Presley, Meilman, 1998). Greek members also tend to view alcohol use more positively than non Greek members (Ham & Hope, 2003) and accept higher drinking rates as normal (Baer, 1994). Furthermore, freshmen who intend to join a Greek organization use alcohol more and report higher rates of alcohol related problems during the first year when compared to incoming freshmen who do not intend to join Greek life (Read, Wood, Davidoff, McLacken, Campbell, 2002).

Finally, students who have higher levels of religious commitment are less likely to binge drink (Durkin, Wolfe, Clark, 1999), to frequently drink heavily (Wechsler, Dowdall, Davenport, & Castillo, 1995a; Wechsler, Dowdall, Davenport, & Rimm, 1995b), or to have alcohol related problems (Templin & Martin, 1999).

2.4.3. Personality Factors

Personality Factors that are related to college student drinking include sensation seeking, impulsivity, and neuroticism. Students who are high sensation seekers tend to have higher levels of problem drinking and bingeing than low sensation seekers. This finding has been consistently replicated, especially among men (Ham & Hope, 2003). Impulsivity is related to alcohol use quantity and frequency but not with alcohol problems (Ham & Hope, 2003). There is also some evidence to support that students who have a weak social bond (their connection between the individual and society is weak or lacking, the individual tends to lack conformity and conscientiousness) may be more prone to engage in problem drinking behavior while abstainers from alcohol tend to

present with a conforming and conscientious personality profile (Rohsenow, 1982; Vollrath & Torgersen, 2002; Watten, 1996).

Students who experience neuroticism appear to be at higher risk for alcohol use disorders than students who do not. Individuals with neuroticism tend to more frequently experience negative affective states such as anxiety, anger, disgust, depression and sadness and they have more difficulty in coping with stress (Costa & McCrae, 1985). Two constructs that are related to neuroticism, self esteem and social anxiety, also appear to be related to drinking problems. Individuals with lower self esteem and greater social anxiety are more likely to be problem drinkers than individuals with higher self esteem and lower social anxiety (Lewis & O'Neill, 2000). Students diagnosed with general anxiety disorder or depression are also more likely to abuse alcohol. Freshmen diagnosed with an anxiety disorder were found to be at least 2 times more likely to have a diagnosis of alcohol dependence at year 4, and this increased to about 3.5 times by year 7 (Kushner, Sher, Erickson, 1999). However, anxiety disorders and alcohol dependence seem to demonstrate a reciprocal relationship. Anxiety disorders lead to alcohol dependence in some cases while alcohol dependence leads to anxiety disorders in others (Kushner et al., 1999). While alcohol use disorders are often linked to depression, typically the depression precedes the alcohol use disorder (Deykin, Levy, Wells, 1987).

2.4.3. Drinking History

Many drinking norms, attitudes, and behaviors are formed before college. Students who use alcohol in high school binge more frequently once in college. Students' high school bingeing behavior is a significant predictor of their college bingeing

behavior (Wechsler et al., 1995a). Students who engage in heavy episodic drinking in high school are more likely to experience alcohol related problems, including drinking and driving, during college (Harford, Wechsler, Muthen, 2002). Pre-college attitudes and norms also appear to affect college drinking behavior. Students who reported a high importance of drinking in high school have higher levels of weekly drinking while in college (Reis & Riley, 2000). Finally, the earlier an individual starts drinking the more likely s/he is to be involved with alcohol in college (Thombs, 2000), drink at higher rates, or experience alcohol related problems (Gonzalez, 1989).

2.4.4. Alcohol Expectancies

Alcohol expectancies refer to the beliefs that individuals have about the effects of alcohol. Individuals who do not believe that alcohol will affect them negatively and believe that alcohol will affect them positively tend to drink more. Individuals who hold less positive alcohol expectancies and greater negative alcohol expectancies tend to drink less (Burke & Stephens, 1999). Problem drinkers tend to have more positive expectancies about the immediate effects of alcohol use and do not think about the possible long-term negative consequences (Lewis & O'Neill, 2000). There are several types of expectancies individuals may hold regarding alcohol. These include global positive change, arousal, sexual enhancement, cognitive and/or motor functioning, social assertion, tension reduction, and social and/or physical pleasure (Ham & Hope, 2003).

Global positive change regards the beliefs that alcohol will give the user an overall positive feeling. Greater beliefs in global positive change have been related to problem drinking, binge drinking, and experiencing negative consequences from drinking

(e.g. blackouts, regretting a sexual situation, experiencing hangover symptoms) (Turrissi et al., 2000). Arousal is another type of alcohol expectancy. Believing that alcohol will cause a physiological arousal, aggression or hostility is related to more frequent alcohol use and more frequent alcohol problems (Wood, Nagoshi, Dennis, 1992). Also, college problem drinkers expect more arousal from alcohol than college non problem drinkers (Lewis & O'Neill, 2000). There is some evidence that beliefs that alcohol will lead to greater sexual pleasure are related to problem drinking (Lewis & O'Neill, 2000). Beliefs about the physiologic effects of alcohol appear to be related to problem drinking. One study found that heavy drinkers are more likely to believe in the power of alcohol to have positive physiological effects than non-heavy drinkers (Lewis & O'Neil, 2000). Another study found that expectation of greater physiological impairment (e.g., get dizzy and get headache) from alcohol consumption was a significant predictor for elevated alcohol use and alcohol problems (Wood et al., 1992).

Beliefs that alcohol will increase sociability and assertiveness has been related to college student drinking. Specifically, social assertiveness expectancies are related to problem drinking (Lewis & O'Neill, 2000), quantity of alcohol consumed (Tran, Haaga, Chambless, 1997), negative drinking effects (Turrissi et al., 2000), more acute effects from drinking (e.g., nausea and vomiting), spending too much money on alcohol, driving while under the influence, and problems with the law (O'Hare & Sherrer, 1997). However, the social assertiveness expectancy may be most important for students with already established psychological problems (e.g. depression, anxiety, negative feelings toward oneself, relationship problems) (O'Hare & Sherrer, 1997). Likewise, students who expect to obtain social and physical pleasure from drinking are more likely to use

alcohol (Martin & Hoffman, 1993), drink frequently (Brown, 1985), and be non problem drinkers (Thombs, 1993). In fact, expectations of social and physical pleasure appear to be less related to problem drinking and more related to social drinking, particularly among men (Thombs, 1993). In addition, social and physical pleasure expectancies are likely held more strongly by individuals who have less experience with drinking than more experienced drinkers (Brown, Goldman, Inn, Anderson, 1980).

Beliefs that alcohol would act to relieve tension and give a sense of relaxation has been associated with alcohol consumption (O'Hare, 1990) problematic drinking (Brown, 1985; Lewis & O'Neill, 2000), quantity and frequency of drinking (Tran et al., 1997), more acute effects of drinking, spending too much money on alcohol, drinking and driving, and problems with the law (O'Hare & Sherrer, 1997).

2.4.5. Drinking Motives

Drinking motives refer to the need that drinking fulfills. These motives are most often assessed through self-report measures about reasons for drinking (Ham & Hope, 2003). Drinking motives that have been identified among college students include coping, conformity, social motives, and enhancement (Ham & Hope, 2003). Drinking as a coping mechanism involves drinking to avoid negative emotional states such as depression and anxiety (Ham & Hope, 2003). Using drinking as a coping mechanism has been related to drinking frequency and drinking problems (Wood et al., 1992), as well as alcohol use intensity and impaired driving (Beck, Thombs, Mahoney, Fingar, 1995). It appears that if an individual has poor coping skills the individual may be more likely to use alcohol as a coping device. This seems particularly true for women (Schall, Weede,

Maltzman, 1991). Some students drink to attain social conformity or peer acceptance and approval (Farber, Khavari, Douglas, 1980). Conformity motives have been associated with alcohol related problems and elevated drinking (Cooper, 1994). It appears that students who drink in order to conform are more likely to be men and have greater self-consciousness and greater anxiety (Ham & Hope, 2003).

Similar to the social conformity motive, some students drink to achieve social affiliation. It appears that social motives are associated with alcohol consumption but not with problem drinking (Cronin, 1997; Kassel, Jackson, Unrod, 2000). However, students who socialize more may more often report social affiliation as a drinking motive simply because they are exposed to more social situations where alcohol is present (Ham & Hope, 2003).

Drinking to enhance internal affective states has been related to drinking problems. Students may be motivated to drink to enhance sensation seeking or to enhance enjoyment (Ham & Hope, 2003). Sensation seekers may drink to fulfill needs for novelty or stimulation (Stewart & Devine, 2000). Students who drink to enhance feelings of thrill are more likely to experience alcohol problems (McCarty & Kaye, 1983) and drinking levels (Schall et al., 1991). Students who drink for “enjoyment” tend to drink more, report many alcohol related problems, drink irresponsibly (McCarty & Kaye, 1983), binge more frequently (McCabe et al., 2002), and report more frequent intoxication (Wechsler & Rohman, 1981).

Overall, it appears that all motives are associated with higher levels of drinking but social motives are the only motives that are associated with non-problematic drinking (Ham & Hope, 2003).

2.4.6. Stress and Coping

The number and severity of stressors college students experience are related to problem drinking (Ham & Hope, 2003). Students who believe that they can alleviate unpleasant moods themselves are less likely to report drinking problems (Kassel et al., 2000). Thus, it appears that an individual's coping ability is related to drinking problems in college (Ham & Hope, 2000). Various types of coping styles have been related to problem drinking among college students. Students who have an emotional coping style are more likely to have more alcohol related problems (Evans & Dunn, 1995; Karwacki & Bradley, 1996) while students who seek social support are less likely to report alcohol related problems (Karwacki & Bradley, 1996). It appears that stress related drinking is related to coping motives and tension reduction expectancies, as well as an individual's skills and self-efficacy to deal with stressors (Ham & Hope, 2003). In other words, one's ability to cope or perception of their ability to cope may mediate the relationship between stress and problem drinking (Ham & Hope, 2003).

2.5. Peer Influence on College Student Problem Drinking

Students perceptions of how much their peers drink and the acceptability of different drinking behaviors are most often referred to as peer drinking norms (Baer et al., 2001). Perceived norms include attitudes regarding the initiation of drinking, drinking quantity and frequency, bingeing, intoxication, and/or drinking behaviors (Ham & Hope, 2003). Students who perceive their peers to encourage and accept heavy drinking are more likely to drink heavily themselves than students who do not perceive these things

from their peers (Larimer, Irvine, Kilmer, Marlatt, 1997; Reis & Riley, 2000). In addition, students who are involved with drinking friends are more likely to be drinkers themselves (Martin & Hoffman, 1993). Students who are more sociable are also more likely to drink (Fondacaro & Heller, 1983). However, this may be because they simply have more opportunity to drink because of their greater sociability (Ham & Hope, 2003). Experimental studies have given support to the idea that being exposed to peer modeling of drinking leads to consumption of similar amounts of alcohol (Collins & Marlatt, 1981; Collins, Parks, Marlatt, 1985).

While the reality of peer drinking behavior appears to influence students' drinking behavior, perceptions of peer norms and attitudes, regardless of the accuracy of those perceptions, also appear to have an impact on behavior. Students have been found to have biased perceived norms for drinking frequency, quantity, and problem involvement (Baer & Carey, 1993; Baer, Stacy, Larimer, 1991). Those students who overestimate the amount of alcohol their peers consume are likely to drink more than students who do not overestimate (Agnostinelli, Brown, Miller, 1995). Students who perceive their peers' attitudes about alcohol to be more liberal are more likely to drink heavily than students who do not perceive such attitudes (Perkins & Berkowitz, 1986). College students have typically estimated their peers' to drink more than they do (Baer & Carey, 1993; Baer et al., 1991). Furthermore, students' perceptions are often an overestimate (perceptions of drinking norms are higher than reported group means) (Baer & Carey, 1993; Baer et al., 1991). While it seems clear that students consistently overestimate peer drinking norms and that these overestimates are related to students'

own high rates of drinking, it is unclear whether the overestimates were present before drinking involvement or after drinking behaviors had been initiated (Ham & Hope, 1993).

It is likely that beliefs about drinking norms develop prior to college.

Therefore, individuals who drink heavily may choose friends and social groups whose behavior and attitudes fit their preconceived beliefs (Baer, 1994; Ham & Hope, 2003). However, the college environment is likely to have additional effects on “pre-college norms beyond selection effects (Ham & Hope, 2003).” In their review of the literature, Ham and Hope (2003) suggest the conduct of more longitudinal research with large samples to tease out the subtleties of the influence of drinking norms on college drinking (Ham & Hope, 2003).

Aside from perceived norms and peer modeling other social factors appear to impact drinking behavior among college students such as the social context and the living environment. In a review of the literature, Ham and Hope (2003) report that students who belong to larger social groups that socialize frequently and whose socialization is in the presence of alcohol are more likely to be problem drinkers (Ham & Hope, 2003). The authors state that this relationship most likely involves the interaction of several variables (Ham & Hope, 2003). Students who live in on-campus residences (e.g. fraternities, sororities, residence halls) typically drink and more often engage in binge drinking than students who live with their parents (Martin & Hoffman, 1993; Montgomery & Hammerlie, 1993; Valliant & Scanlan, 1996). Students who live with their parents also have lower risk of suffering from second hand effects of alcohol use (Wechsler et al., 2002). Students living in Greek housing tend to drink more and experience more second hand effects of alcohol than all other students (Wechsler et al., 2002). Students who live

in co-ed housing also appear to be at greater risk for alcohol related negative consequences (Harford et al., 2002). In general, men seem to be more susceptible to the effects of housing on drinking behavior (McCabe et al., 2002; Valliant & Scanlan, 1996). However, it is important to note, as pointed out in the review of literature conducted by Ham and Hope (2003), that students who drink more may self select into these particular types of “risky” housing while students who drink less or abstain may be more prone to choosing to live with their parents (Ham & Hope, 2003). Or, it is possible that parents truly do play a protective effect, being less tolerant of negative alcohol related behaviors and monitoring their children’s whereabouts more often (Ham & Hope, 2003). With respect to the impact of social influence on drinking behavior, Ham and Hope (2003) conclude that more work is needed to “determine whether the apparent effects of peer influence and drinking environment are due to selection effects (Ham & Hope, 2003).”

2.6. Parental Influence on College Student/Adolescent Problem Drinking

Fifteen studies that investigated parental influence on college student drinking were identified. A study conducted by Kuther and Higgins-D’Alessandro (2003) found that parental norms (parent’s attitudes towards drinking and parental approval of child’s drinking) influenced college juniors’ alcohol use but had no effect on the alcohol use of college freshmen (Kuther & Higgins-D’Alessandro 2003). A study conducted by Turrisi et al. (2000) with college freshmen during the first 1-2 months of school found that students who had ever talked with their mothers regarding alcohol were less likely to hold positive beliefs about alcohol (Turrisi et al., 2000). Students were asked if they had talked with their mothers about how drinking could get them in trouble with the police,

how drinking changes a person's personality, about the negative consequences of mixing alcohol and sex, and about the importance of being committed to a healthy lifestyle.

Students who talked with their mothers about alcohol were less likely to believe that alcohol causes positive transformations, that alcohol can enhance social behaviors or that teens that drink are cool. In addition, students who had talked with their mothers about alcohol were more likely to believe that alcohol can increase negative affect (Turrissi et al.).

The importance of parenting style on college students' drinking has also been investigated. In a 2001 study of students, Patock-Peckham, Cheong, Balhorn, and Nagoshi (2001) found that permissive parenting style indirectly influenced alcohol use and alcohol problems through its effect on self regulation and perceived drinking control (Patock-Peckham, Cheong, Balhorn, Nagoshi, 2001). Specifically, permissive parenting was negatively related to self regulation which is protective against alcohol use and abuse. Furthermore, for women, having an authoritative mother was protective against alcohol use and abuse as having an authoritative mother was shown to be related to higher levels of self regulation (Patock-Peckham et al.). This contradicts the conclusion drawn by Hanson (1973) that students whose parents were highly permissive regarding alcohol consumption were less likely to drink (Hanson, 1973). A longitudinal study which surveyed college students, their parents and one sibling during freshmen year and again during senior year found that by senior year children from non-authoritarian-directive or authoritative homes reported lower alcohol use than students who came from democratic or unengaged homes. There appeared to be no influence of parenting style on freshmen students. The authors attribute this to the novelty of the college environment.

They hypothesize that situational influences such as the increase in freedom and availability of alcohol suppressed family type differences during students' freshman year (Weiss & Schwarz, 1996).

A cross sectional study conducted with college students attending a Midwestern university found that greater alcohol use among students was associated with having achieved less conflictual independence (having attained a relationship free from anger and resentment) from their parents. These findings were most frequent and strongest with respect to the mother-child relationship (Haemmerlie, Steen, Benedicto, 1994).

Student alcohol use has also been found to be associated with parental levels of alcohol use. It has been consistently found that students who have parents who drink more in quantity and frequency are more likely to drink than students whose parents did not drink (Reeves, 1984; Jung, 1995). Standing and Nicholson (1989) found that for the first two years on campus, students' drinking behaviors corresponded to that of their parents and then shifted to that of their friends (Standing & Nicholson, 1989). Fromme and Ruela (1994) found that perceived similarity to parents moderated the relation between students' alcohol use and their perceptions of their parents drinking (Fromme & Ruela, 1994).

Some research has focused on the similarity of college students' attitudes towards drinking and their parents' attitudes. Wilks and Callan (1984) found that sons and parents had similar attitudes towards drinking while there were larger differences in the attitudes of daughters and parents especially concerning women drinking, moderated uses of alcohol and the social status benefits of drinking (Wilks & Callan, 1984).

In a delphi study designed to assess what topics college students felt were important to talk about with parents alcohol, along with sex, drugs and HIV, ranked as the most important discussion topics related to students' health. The majority of students believed that health discussions were important or very important for promoting their health (Birch & O'Toole, 1997).

There has been some previous dissertation research regarding the parent-child relationship and college drinking behavior. A study conducted by Jackson (2001) found that both parents and peer groups have similar influence on drinking (Jackson, 2001). Camlibel (2000) found that binge drinkers report insecure attachment patterns to their parents (Camlibel, 2000). Gomez (2000) found that students who were exposed to familial and/or peer group modeling of bingeing were more likely to engage in bingeing themselves (Gomez, 2000).

While there are relatively few studies of parental influence on college student drinking, there is a substantially greater amount of literature on the impact of parents on younger adolescents and children's drinking behavior. Parental behaviors such as communication, monitoring, and drinking have been found to be related to adolescent drinking behavior. Family characteristics also appear to have an influence on adolescent drinking.

Open communication with parents has been associated with lower levels of substance use (Kafka & London, 1991). Beck et al. (2003) found that among a sample of 12-17 year olds adolescents who reported they would talk to their mother if they had a question about alcohol were less likely to report that they ever drank without their parents knowing and less likely to report that they ever drank their parents' alcohol (Beck et al.,

2003). Adolescents who reported that they would talk to their father if they had a question about alcohol were less likely to report ever being talked into drinking when they did not want to drink (Beck et al.). A study of eighth and twelfth graders found that, in general, a high degree of problem related communication with parents is associated with lower probability of drinking. However, twelfth graders who communicated with their fathers were more likely to drink (Lassey & Carlson, 1980). A randomized trial that taught parents how to consistently communicate clear norms against adolescent substance use, effectively and proactively manage their families, reduce family conflict, and to help children learn skills and resist anti-social peer influences was found to significantly reduce the growth of alcohol use among sixth graders over the course of three years (Park et al., 2000).

Another randomized intervention trial, Project Northland, which incorporated in the intervention parental involvement and education, peer leadership activities, social-behavioral curricula in school, and community wide activities, found that among others, parent-child communication about alcohol and alcohol use mediated the relationship between intervention group and reduced alcohol use (Komro et al., 2001). Conversely, in a prospective study of fifth graders, parental communication against alcohol use was unrelated to drinking in the past 30 days when students were surveyed two years later (Jackson, Henriksen, Dickinson, 1999). Other studies in which communication has not been found to be related to alcohol use include a randomized trial in which parents were trained to communicate with their children about alcohol use (Toomey, Williams, Perry, Murray, 1996) and a prospective study in which communication about rules, consequences, and media specific to alcohol use were unrelated to initiation of drinking

(Ennett, Bauman, Foshee, Pemberton, Hicks, 2001). Furthermore, in the latter study, escalation of alcohol use was significantly predicted by frequent communication regarding rules (Ennett et al., 2001). While in general it appears that communication is protective, the specific nature of that communication is unclear. Many studies examine different aspects of parent-child communication. For example, some studies examine open communication or problem related communication in general, while some examine rules regarding substance use, communication about negative consequences of use, communication regarding risk reduction skills, or communication regarding drinking norms. Furthermore, some studies assess adolescents' perceptions regarding the occurrence of these types of communication while others assess parental perceptions. Thus, it is not yet possible to say which type of communication is *best* suited for reduction of adolescents' alcohol risk behaviors.

Adolescent perceptions of parental monitoring (the extent to which the parent(s) monitors the whereabouts of their child) are also negatively correlated with adolescent drinking (Cotrell et al., 2003; Borawski et al., 2003; Alia et al., 2003; Raboteg-Saric et al., 2001). Cotrell et al. (2003) also found that adolescents' perceptions of how much their parents know about their activities are more predictive of their own involvement in risk than their parents' perceptions about their monitoring efforts (Cotrell et al., 2003). Beck et al. (2003) found that among a sample of 12-17 year olds, perceptions of parental monitoring were protective against alcohol use, intention to drink, having ever been talked into drinking when one did not want to drink, having ever obtained alcohol, having ever drank without a parent knowing, having seen other teens drinking in the past 30 days, having been to a place parents disapproved of in the past 30 days, and having hung

out with friends who were drinking in the past 30 days (Beck et al., 2003). Borawski et al. found that higher levels of negotiated unsupervised time were associated with greater likelihood of males using alcohol (Borawski et al.). Jackson et al. (1999) found that in a prospective study of fifth graders students who at baseline perceived no parental monitoring of alcohol use and reported being allowed to have a drink of alcohol at home were more likely to use alcohol within the past 30 days when surveyed two years later (Jackson et al., 1999). Even among younger children (third and fifth graders) parental supervision and rule setting has been found to be negatively related to alcohol use (Jackson, Henriksen, Dickinson, Levine, 1997). Parental approval of alcohol use has been found to directly predict alcohol related consequences (Stice, Barrera, Chassin, 1998). Thus, parental monitoring has consistently been found to be protective against engagement in drinking and alcohol related behaviors.

Several studies have identified the impact of parental drinking behaviors on adolescents' drinking. It appears that the more adolescents perceive that their parents drink, the more likely they are to drink themselves (Anderson & Henry, 1994; Lassey & Carlson, 1980; Zhang, Welte, Wieczorek, 1999). In a study of 320 rural Australian high school students mother and fathers' alcohol consumption was indirectly related to alcohol misuse by generating positive attitudes towards alcohol and alcohol related subjective norms and by reducing perceived behavioral control (Williams & Hine, 2002).

Family bonding has been found to be negatively related to adolescent substance use as has a lack of parental support (emotional and resource support) (Anderson & Henry, 1994). In a study conducted among 692 9th and 10th graders Borawski et al. (2003) found that higher levels of perceived parental trust were associated with less

alcohol use among males (Borawski et al., 2003). A study of 8th and twelfth graders found that adolescents who were closer than average to their parents were less likely to be frequent drinkers (Lassey & Carlson, 1980). A study of males aged 16-19 found that boys who were close to their mothers were less likely to drink alcohol (Zhang et al., 1999). Parental support has been found to be negatively related to alcohol related consequences through its impact on alcohol use. Support was also found to mitigate the relationship between alcohol consumption and consequences (Stice et al., 1998). Parental involvement (operationalized as parents discussing the grades adolescents receive, parents calling another home to confirm adolescents whereabouts, parents listening to adolescents' concerns about parties, and parents taking adolescents and their friends places to have a good time) did not appear to have much impact on alcohol use when examined among a sample of 2017 twelfth grades in Ohio (Olds & Thombs, 2001).

Parenting style may also be important for adolescent drinking behavior. In a study of 320 rural Australian high school students permissive parenting was found to be indirectly related to alcohol misuse by generating positive attitudes and subjective norms towards alcohol use among students (Williams & Hine, 2002). However, a study conducted by Jackson et al. (1999) found that type of parenting (authoritative, authoritarian etc) has been found to be unrelated to adolescent drinking behavior (Jackson et al., 1999). Less permissive parental attitudes towards drinking have also been found to be protective against drinking (Zhang et al., 1999; Ary, Tildesley, Hops, Andrews, 1993).

2.7. Interventions to Reduce College Students' Problem Drinking & Recommendations of the National Institute on Alcohol Abuse and Alcoholism's Task Force on College Drinking

Prior to the 1960s, colleges operated under the legal theory of *in loco parentis*. This meant that colleges served in place of parents and were responsible for students' conduct and welfare. Colleges provided strict control over behavior but too little positive action to foster growth and development outside the classroom. Around 1960, in the midst of a changing culture and social issues such as a reduction in the age of majority, the Vietnam War, and an increase in the numbers of non-traditional students, *in loco parentis* became less applicable as students gained more and more freedom on college campuses (Thomas, 1991; Gregory & Ballou, 1986). Today, the role of the college is not that of strict disciplinarian but promoter of intellectual and psychosocial development. In this way, colleges now operate in a more "quasi-parental, yet permissive role." In this role, institutions can be held accountable for the actions of their students and are mandated to provide services for students' intellectual and psychosocial maturation (Thomas, 1991; Gregory & Ballou, 1986). The federal government appears to endorse this quasi-parental role as colleges are subject to the mandates of legislation such as the Drug Free Schools and Campuses Act. This act delineates the obligation of the institution to prohibit drug and alcohol use by students, to report certain conduct problems to local authorities, and to run drug and alcohol awareness programs. This law also forces colleges to identify, to the extent possible, students who abuse drugs and alcohol and make continued education and employment contingent upon their seeking treatment (Thomas, 1991). While *in loco parentis* no longer exists as it once did, colleges

and universities have a vested interest in intervening in students' lives to prevent alcohol problems. While institutions may never again see the strict control of the days of *in loco parentis*, it appears that the pendulum is swinging back in the direction of institutional oversight and responsibility to protect and prevent problems associated with alcohol.

The Task Force on College Drinking, created in 1998 to respond to the increasingly urgent problem of drinking among college students, has created a ranking of recommended strategies to assist institutions in preventing substance abuse among college students. The task force has broken up the recommended strategies into three tiers on the basis of evidence available to support or refute them (National Institute of Alcohol Abuse and Alcoholism [NIAAA], 2002). The first tier includes strategies that have proven effective in reducing individual problem, at-risk, or alcohol dependent drinking. These strategies include 1) combining cognitive-behavioral skills with norms clarification and motivational enhancement interventions, 2) offering brief motivational enhancement interventions and 3) challenging outcome expectancies (NIAAA, 2002).

Cognitive behavioral skills training aims to change an individual's beliefs about alcohol by changing their expectancies about alcohol's effects, documenting daily alcohol consumption, and learning to manage stress (NIAAA, 2002). Norms clarification involves refuting incorrect perceptions regarding the amount of alcohol other students consume and beliefs about the acceptability of drinking behavior (NIAAA, 2002). Motivational enhancement is designed to change an individual's intrinsic desire to change their behavior. With this type of intervention students receive non-judgmental feedback about their personal drinking behaviors and support to help them change their behaviors. Research has shown that combining these three behaviors is successful in

reducing alcohol consumption among college students (Larimer & Cronce, 2002).

Larimer and Cronce (2002) conducted a review of studies that investigated individually focused prevention and treatment strategies for college student drinking. The investigators found that there was little support for the efficacy of informational interventions in changing drinking behavior and that cognitive-behavioral skills based interventions and brief motivational feedback have been consistently more successful than have knowledge based interventions (Larimer & Cronce, 2002).

The second strategy, brief motivational enhancement interventions, requires that students receive personalized motivational enhancement sessions either individually or in small groups. This strategy has been successful in reducing alcohol consumption and negative consequences such as excessive drinking, driving after drinking, riding with an intoxicated driver, citations for traffic violations, and injuries (D'Amico & Fromme, 2000; Larimer & Cronce, 2002; Marlatt et al., 1998; Monti et al., 1999).

The third strategy of the first tier is challenging alcohol expectancies. This strategy employs a combination of information and experiential learning to change students' expectations about the effects of alcohol. This strategy aims to change students' beliefs that alcohol produces positive effects such as sociability and sexual attractiveness (Darkes & Goldman, 1993; Darkes & Goldman, 1998; Jones, Silvia, Richman, 1995). The effects of this approach seem to more sustainable among men than among women (NIAAA, 2002).

The second tier strategies are those strategies that have been identified to be successful among similar populations. The Task Force recommends that these strategies be tested among college students (NIAAA, 2002). These strategies include

environmental approaches to reducing college drinking. They include: 1) increased enforcement of minimum drinking age laws, 2) implementation, increased publicity, and enforcement of other laws to reduce alcohol-impaired driving (e.g. legal blood alcohol limits, sobriety check points, providing server training education, instituting license revocation laws), 3) restrictions on alcohol retail outlet density, 4) increased prices and excise taxes on alcoholic beverages, 5) responsible beverage service policies in social and commercial settings, and 6) the formation of a campus and community coalition involving all major stakeholders to implement strategies effectively (NIAAA, 2002).

The third tier of strategies recommended by the Task Force are those strategies that make sense intuitively or those that have strong theoretical support but still require comprehensive evaluation (NIAAA, 2002). Strategies included in this tier are: 1) adopting campus based policies and practices that appear to be capable of reducing high-risk alcohol use (e.g. reinstate Friday classes and exams to reduce Thursday night partying, implementing late night alcohol free activities, establishing alcohol free dorms, controlling or eliminating alcohol at sports events and prohibiting tailgating parties that model heavy alcohol use), 2) increase enforcement at campus based events that promote excessive drinking, 3) increasing publicity about and enforcement of underage drinking laws on campus and eliminating "mixed messages," 4) consistently enforcing disciplinary actions associated with policy violations, 5) conducting marketing campaigns to correct student misperceptions about alcohol use (social norms campaigns), 6) provision of "safe rides" programs, 7) regulation of happy hours and sales, and 8) informing new students and their parents about alcohol policies and penalties before arrival and during orientation periods (NIAAA, 2002).

In addition to recommending the evaluation of an intervention that involves parents the Task Force has devoted a segment of their website to parents in which they encourage parents to discuss alcohol risks with first year students early in the fall semester- a time when excessive drinking is common. They encourage parents of first year students to inquire about campus alcohol policies, call their sons and daughters frequently, ask about roommates and living arrangements, discuss the consequences of excessive drinking such as date rape, violence, and academic failure, and discuss the penalties for underage drinking (NIAAA, 2002). The website also gives parents resources to aid in talking to their children about the consequences of college drinking. While these efforts are sound advice based on research with adolescents, these tactics have not been tested as to their effectiveness with first year college students living away from home.

One parent based intervention to reduce college student drinking has been tested. One hundred fifty-four college freshmen were randomized to either the parent, intervention group or the control. Investigators administered the intervention to parents between the end of students' high school careers and the beginning of their college experience. **Parents were asked to implement the intervention before their teens started college.** The intervention educated parents about college drinking and bingeing, motivated parents to talk to their teens and encouraged them that their discussions could make a difference. Parents were also given strategies to improve their communication. In addition parents were instructed on how to teach teens how to deal with peer pressure, how to teach assertiveness skills, how to teach teens to deal with peer pressure and common pressure lines. Parents were also taught about alternatives to drinking, drinking

tendencies of college students, consequences of college drinking, social norms, and the context of college drinking and how to talk to their teens about these topics. They were also instructed how to talk to their teens about the effects of alcohol, how to recognize when someone has a drinking problem, and the course of action to take when someone has a drinking problem. Parents were informed about parental norms with respect to alcohol use in teens and parental reluctance to engage in discussions about binge drinking (Turrisi et al., 2001). Students were surveyed 90 days into their first semester at college. The intervention group reported significantly less drinking and drunkenness and reported fewer drinking consequences. The intervention students also reported less positive perceptions regarding drinking activities and perceived that their parents would hold similar perceptions. Finally, intervention students reported lower perceptions of approval of alcohol consumption for both peers and parents (Turrisi et al.).

2.8. Relevant Theories for Explaining College Students' Problem Drinking

Two theories that may provide insight into college drinking include the Health Belief Model (HBM) and the Theory of Reasoned Action (TRA). The HBM (developed by Rosenstock and Hochbaum, 1950) was originally developed to explain engagement in preventive health behaviors. The theory is derived from expectancy theory and refers to a view of rational decision making. Perception (or belief) is emphasized in the HBM, meaning a person's perception of reality is more important for their decision making than reality itself. Perceptions are based on four factors: the stimuli an individual receives, the context within which the stimuli is received, an individual's previous experience, personality and mood, the things of which a person is consciously aware of at a given

point in time. There are four categories of beliefs in the HBM: perceived severity, perceived susceptibility, perceived benefits, and perceived barriers. Cues to action drive an individual's readiness to take action by increasing perceived risk and interventions based on the HBM usually include communications as cues to action directed towards increasing the salience of beliefs about the severity of and susceptibility to the health problem (Glanz et al., 2002; Simons-Morton, Greene, Gottlieb, 1995).

The TRA (developed by Ajzen and Fishbein, 1975) focuses on an individual's intention to perform a specific behavior because intent, a person's motivation to act, has been found to be strongly associated with behavior. In the TRA, beliefs are viewed as the basic components of attitudes. The TRA postulates that attitudes toward the behavior and attitudes about what important others think the individual should do (subjective norm) are associated with intent to behave in a certain way. Traditionally, subjective norms are derived by multiplying an individual's normative belief about a referent by the individual's motivation to comply. If there is more than one referent the product scores are summed (Glanz et al., 2002; Simons-Morton et al., 1995). The Theory of Planned Behavior is a modification of the TRA in which behavioral control is included in the explanation of behavior (Glanz et al.; Simons-Morton et al.). Most studies of a variety of behavioral intentions have found that subjective norms are less predictive of intention than are attitudes (Johnston & White, 2003). For example, a meta-analytic review of 185 reasoned action/planned behavior studies Armitage and Conner (2001) reported that the average contribution of attitude to behavioral intention was 0.49 while the average contribution of subjective norm to the prediction of intention was 0.34 (Armitage & Conner, 2001).

Constructs from the HBM and the TRA have been used in attempts to explain college students' drinking behaviors before. Sands, Archer, and Puleo (1998) found that alcohol abuse could be explained by perceived severity and perceptions of barriers to drinking reduction as well as self-efficacy and social influences (Sands, Archer, Puleo, 1998). The impact of perceived risk on drinking has been studied independently. An intervention study conducted by Miller, Toscova, and Miller (2000) showed that it was possible to increase students' perceived risk and that such an intervention is capable of reducing alcohol use (Miller, Toscova, Miller, 2000). Some studies have found that perception of risk is a significant predictor of alcohol use (Duistman & Colbry, 1995). However, in a study conducted by Wild, Hinson, Cunningham, and Bacchiochi (2001), students who were classified as problem drinkers were more likely to perceive a high risk of experiencing alcohol related harm. But, these at risk drinkers were more likely to rate comparable peers as more susceptible to harm than themselves. Non at risk drinkers did not rate comparable peers differently than themselves (Wild, Hinson, Cunningham, Bacchiochi, 2001).

A qualitative study of students from a mid-western university identified issues that students perceived as risks of binge drinking and students' perceived susceptibility to those risks. Identified risks of binge drinking included drunk driving, other legal situations, sexual experiences including rape, passing out or losing control, fights, vandalism and destruction of property, physical illness (alcohol poisoning, hangovers, alcoholism), physical injuries, emotional consequences (e.g. guilt, regret, hurt feelings, impaired judgment), drug use with alcohol, academic failure, financial consequences, and parental knowledge (Wolburg, 2001). Students were then asked about the severity of

these threats. Participants responded that students have binged with few serious consequences and that the worst outcome was getting sick. Even if a student experiences more severe consequences they generally still feel accepted by other students. Furthermore, students report feeling that drinking is relatively safe compared with other drugs, that they feel personally invulnerable to drinking consequences, and that since almost all students drink, that is, because drinking is the norm, that drinking must be O.K (Wolburg).

There have been some studies that support the TRA in the explanation of drinking (Kilty, 1978; Budd & Spencer, 1984; Schlegel, D'Avernas, Zanna, DeCourville 1992; Trafimow, 1996). There have been fewer studies that apply the TRA to students' drinking behavior. Among a sample of 2,074 high school and college students Laflin, Moore-Hirschl, Weis, and Hayes (1994) found that peer subjective norms and students' attitudes predicted alcohol use (Laflin, Moore-Hirschl, Weis, Hayes, 1994). One study of college students at a Welsh university found that the TRA model accounted for 29% of the variance in the frequency of binge drinking (Norman, Bennett, Lewis, 1998). Among a sample of 379 fraternity members, Trockel (2003) found that perceived consumption norms of brothers and perceived subjective norms of brothers were significant predictors of alcohol consumption levels (Trockel, 2003). The authors state that perceived subjective norms may be more helpful for intervention development than the current focus on correcting students' perceptions of consumption norms (Trockel). One study has been identified in which adolescents' alcohol misuse was investigated in the context of the TPB with respect to parental influence. In this investigation by Williams and Hine (2002) parental subjective norm was directly related to alcohol misuse

(standardized path coefficient = 0.23) as was attitude toward drinking alcohol (standardized path coefficient = 0.35) and behavioral control (standardized path coefficient = -0.19) (Williams & Hine, 2002).

2.9. Web Based Surveys

Internet surveys conducted with college students can be both reliable and valid. Cronk and West (2002) investigated the differences between an in-class Web survey, in-class paper-and-pencil survey, take-home Web survey, and take-home paper-and-pencil survey (Cronk & West, 2002). They found that there were no significant differences in scores on a morality scale between the different survey formats. However, the Web-based instrument had the lowest response rate (Cronk & West, 2002). In an investigation of Web-based survey methodology to assess health risk behavior, Pealer, Weiler, Pigg, Miller, and Dorman (2001) found that undergraduates are just as likely to respond to a Web survey compared to a mail survey and that students are more likely to answer socially threatening items using the Web-based method (Pealer, Weiler, Pigg, Miller, Dorman, 2001). The group found no significant differences between the Web survey and mail survey groups on response rates, item completion and item completion errors. They also reported that the Web-based survey takes less time to administer. The authors state that in a college population a Web-based survey should not discourage participation, especially if participants are interested in the questionnaire content (Pealer et al., 2001). A recent report examined mode effects for collecting alcohol and other drug use data from undergraduates (n=3,500) using web-based survey mode and mail-based survey mode. There were no significant differences between modes in data quality or

substantive responses (McCabe et al., 2002). Benefits of web-based surveys include reduced implementation costs, greater appeal to certain target groups, improved questionnaire formatting, improved data quality, elimination of data entry, reduced processing costs and faster data collection (Kypri & Gallagher, 2003).

2.10. Summary of Literature and Rationale for Study

Due to the many adverse consequences of excessive alcohol use, drinking among college students, particularly freshmen, is a public health problem of great concern as is evidenced by the great deal of attention given to the issue by the CDC and the Healthy People 2010 objectives as well as by the NIAAA and the Task Force on College Drinking. This study examined the impact that communication delivered by parents, primarily about negative alcohol related consequences, can have on college freshmen.

The study focused on communication about the negative effects of alcohol for three reasons. First, while many parent behaviors have been found to influence children's drinking, parent-child communication is the behavior that makes the most sense to study among a group of young adults living away from home. Because students are away from home, other parental behaviors such as monitoring and parent involvement probably do not take place as often as parental communication. Therefore, it is not unreasonable to think that communication may be the most frequent and the most powerful way that parents of on-campus college students can influence their children. Second, this study focused on communication about the negative consequences of alcohol. Communication about the negative consequences of alcohol has previously been found to be related to negative beliefs about alcohol among college students. While there

is a paucity of evidence about the effects of communication regarding the negative effects of alcohol on actual drinking behavior, the HBM postulates that beliefs about a behavior are predictive of engagement in that behavior. Thus, if communication about the negative effects of alcohol increases students' perceived risk (perceived susceptibility and perceived severity), the HBM would predict that problem drinking would be reduced.

Third, tier one recommendations from the Task Force on College Drinking include clarifying norms (beliefs about the acceptability of drinking behavior) and challenging outcome expectancies (beliefs about the positive effects of alcohol). Communication about the negative consequences of drinking has the potential to do both these things while other alcohol related communication such as that regarding skills and self efficacy do not appear to have face validity in line with norms clarification and expectancy challenges. In fact, some types of skill-building communication, such as teaching students how to pace their drinking or how to make arrangements for a designated driver, may actually communicate a norm that is harmful, such as that drinking is acceptable to the students' parents. This could have the same type of harmful effect on drinking that permissive parenting styles appear to have on adolescents and college students. Fourth, the NIAAA has recommended that parents discuss the risks and consequences of alcohol and excessive drinking with their college students. However, while the NIAAA recommends that parents engage in communication regarding the negative effects of alcohol, there is a lack of evidence of the effects of this parent-child communication while students are away at school. Thus, research on the effects of communication regarding negative consequences is needed to inform such recommendations.

In examining the mechanism through which communication influences problem drinking, constructs borrowed from two theoretical frameworks were compared. These were perceived risk (operationalized as perceived susceptibility and severity) from the HBM and subjective norms and attitudes borrowed from the TRA. Constructs from these theoretical frameworks were chosen for two reasons. First, several other investigations have found support for constructs from these theories in explaining drinking behaviors among both adolescents and college students. Second, the constructs borrowed from these theories may be impacted by communication regarding the negative consequences of alcohol use. Specifically, the HBM postulates that perceived susceptibility and perceived severity are related to behavior. Thus, if communication about the negative effects of alcohol increases students' perceived risk (perceived susceptibility and perceived severity) the HBM would predict that problem drinking would be reduced. Likewise, the TRA postulates that subjective norms and attitudes are related to behavior through behavioral intention. Thus, if communication about the negative effects of alcohol changes students' subjective norms and attitudes toward alcohol, the TRA would predict that problem drinking would be reduced. Other theoretical models, such as Social Cognitive Theory and Social Learning Theory, focus on skills and self-efficacy that were not expected to be changed as a result of negative effects communications. Thus, the constructs borrowed from the HBM and the TRA (perceived risk, attitude, subjective norm) appeared to create valid (face validity) frameworks for explaining the relationship between communication about the negative consequences of alcohol and problem drinking.

The constructs cues to action and perceived risk (operationalized as perceived susceptibility and perceived severity) formed the model based on the HBM and subjective norms and attitudes formed the model based on the TRA. For the model based on the HBM, parental communication was conceived of as representing a cue to action. Perceived benefits and barriers (HBM) and intention to engage in the behavior (TRA) are constructs that were not used to explain college students' problem drinking in this study. In Glanz's et al. (2002) description of the HBM, perceived benefits and barriers directly affect the likelihood of the behavioral outcome, independent from perceived risk (Glanz et al.). Furthermore, communication regarding the negative effects of alcohol was not expected to directly influence students' perceptions of the benefits and barriers related to behavior change. The purpose of this investigation was to test the mechanism through which communication impacted problem drinking. This investigation was not intended to develop a complete model of problem drinking. Therefore, only the theoretical constructs that were believed to mediate the relationship between communication and problem drinking were included in the models. The construct, intention, from the TRA was not included because, as this was a cross sectional study, it was inappropriate to use intention as a predictor of behavior measured at the same point in time (Williams & Hine, 2002). Thus, the most salient constructs from the HBM (perceived risk) and the TRA (subjective norms and attitudes) were selected for comparison.

Finally, this study focused on the influence that parents have on college students' drinking. Numerous studies have found that parental behaviors can influence adolescent drinking. While fewer studies have investigated the influence parents can have on college students' drinking and while students away at school have more contact with their

peers, it is unreasonable to assume that parents suddenly lose all influence over their children once children move away to school. Furthermore, college students report that it is important to talk with parents about issues such as alcohol. Thus, parents may be an untapped resource in the prevention of college drinking problems. This hope appears to be held by the NIAAA as well, as they have recommended that parents be informed about campus alcohol policies and penalties and that parents discuss the risks and consequences of alcohol and excessive drinking with their college students.

III) METHODOLOGY

3.1. Timetable

The timetable for this study is shown below (Figure 3.1.). The study was broken into five phases: the proposal phase, development phase, implementation phase, analysis phase, and reporting phase. The proposal phase consisted of developing and defending the proposal and occurred between October and December 2003. Between October 2003 and March 2004, the survey was revised and finalized in the development phase. This phase included the following activities: focus groups, observed pre-testing with in-depth interviews, a pilot test, an alpha test, and expert review. During the implementation phase (March 2004 – April 2004), participants were recruited, the survey was administered and data was collected. Between May and September 2004, data was analyzed (analysis phase). Findings were reported and the dissertation defense occurred during the reporting phase.

| | Oct-03 | Nov-03 | Dec-03 | Jan-04 | Feb-04 | Mar-04 | Apr-04 | May-04 | Jun-04 | Jul-04 | Aug-04 | Sep-04 | Oct-04 | Nov-04 | Dec-04 |
|--|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Phase I: Proposal | | | | | | | | | | | | | | | |
| Write Proposal/Literature Review | | | | | | | | | | | | | | | |
| Proposal Defense | | | | | | | | | | | | | | | |
| Proposal Revisions | | | | | | | | | | | | | | | |
| Phase II: Development | | | | | | | | | | | | | | | |
| Research Assistant: Recruitment/Training | | | | | | | | | | | | | | | |
| Development: Measures | | | | | | | | | | | | | | | |
| Development: Pretesting guides | | | | | | | | | | | | | | | |
| Scheduling & Recruitment for Pretesting Activities | | | | | | | | | | | | | | | |
| Pretesting: Focus Groups | | | | | | | | | | | | | | | |
| Survey Revision | | | | | | | | | | | | | | | |
| Web Survey Programming | | | | | | | | | | | | | | | |
| Pretesting: Observed Pretest & In-depth Interviews | | | | | | | | | | | | | | | |
| Web Survey: Revision | | | | | | | | | | | | | | | |
| Web Survey: Pilot Test | | | | | | | | | | | | | | | |
| Web Survey: Finalized | | | | | | | | | | | | | | | |
| Phase III: Implementation | | | | | | | | | | | | | | | |
| Sampling | | | | | | | | | | | | | | | |
| Recruitment | | | | | | | | | | | | | | | |
| Survey in Progress | | | | | | | | | | | | | | | |
| Reminder Emails & Phone Calls | | | | | | | | | | | | | | | |
| Phase IV: Analysis and Implementation | | | | | | | | | | | | | | | |
| Data Cleaning & Analysis | | | | | | | | | | | | | | | |
| Phase V: Reporting | | | | | | | | | | | | | | | |
| Write Up | | | | | | | | | | | | | | | |
| Defend Dissertation | | | | | | | | | | | | | | | |
| Make Revisions | | | | | | | | | | | | | | | |

Figure 3.1. Timetable

3.2. Hypotheses and Conceptual Framework

The following hypotheses were tested:

Hypothesis 1: Students' perceptions of post-matriculation parent-child communication regarding the negative consequences of alcohol use are protective against problem drinking among college students.

Hypothesis 2: The relationship between students' perceptions of parent-child communication and problem drinking is mediated by parental subjective norms and attitudes toward drinking (constructs borrowed from the TRA).

Hypothesis 3: The relationship between students' perceptions of parent-child communication and problem drinking is mediated by perceived risk, operationalized as perceived susceptibility and perceived severity (constructs borrowed from the HBM).

Hypothesis 4: The relationship between students' perceptions of parent-child communication and problem drinking is mediated by parental subjective norms, attitudes toward drinking, and perceived risk (additive model using constructs borrowed from both the TRA and the HBM).

Hypothesis 5: The relationship between students' perceptions of parent-child communication and problem drinking is best explained by the additive path model utilizing constructs borrowed from both the TRA and the HBM.

Three theoretical frameworks were compared using path analysis and structural equation modeling. They appear below. *Please note, for simplicity, confounding variables controlled in analysis are not shown in the theoretical frameworks. A thorough discussion of these variables and their control appears in the Analysis section.*

Figure 3.2. explains the association between communication and alcohol use using constructs from the TRA. Figure 3.3. explains the association between

communication and alcohol use using constructs from the HBM. Figure 3.4. explains the association between communication and alcohol use using constructs from both the TRA and the HBM. These models were tested to determine through which mechanism the association between communication and alcohol was best explained. The model that best explains the relationship between communication and problem drinking is the model in which the direct relationship between communication and problem drinking is the smallest due to the fact that more variance in the outcome is explained by the theoretical constructs. The primary outcome variable for this investigation of first year college students drinking behaviors was **problem drinking, defined as drinking that resulted in the occurrence of negative consequences since matriculating at the University of Maryland.**

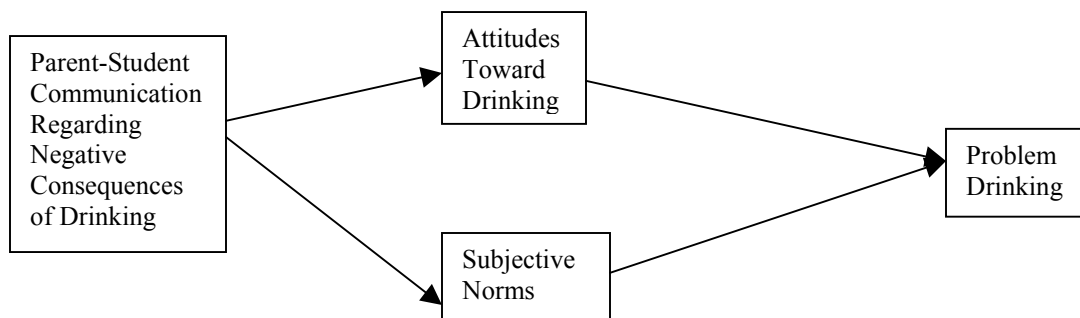


Figure 3.2. Model of The Association of Parent-Child Communication with Problem Drinking as Explained using constructs from the Theory of Reasoned Action

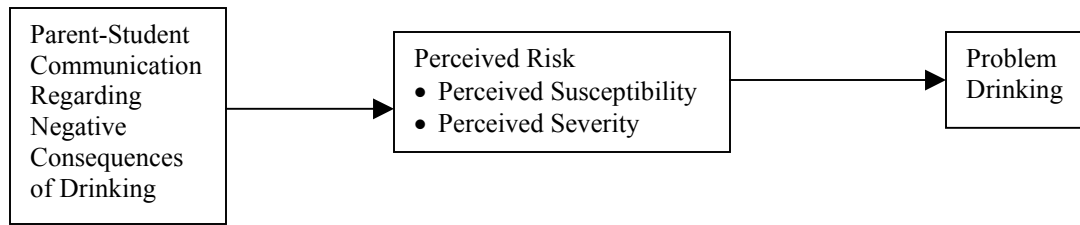


Figure 3.3. Model of The Association of Parent-Child Communication with Problem Drinking as Explained using constructs from the Health Belief Model

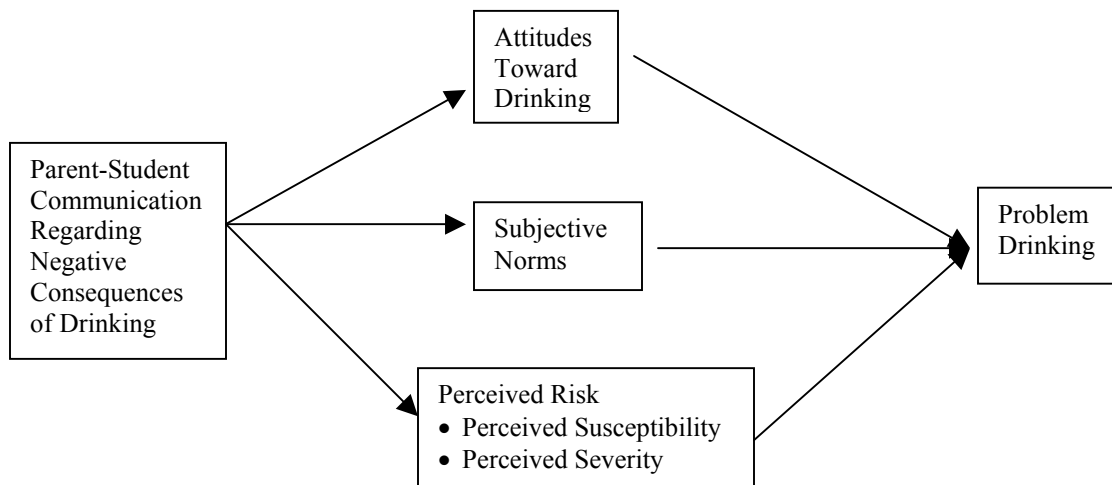


Figure 3.4. Model of The Association of Parent-Child Communication with Problem Drinking as Explained using Constructs from the Theory of Reasoned Action and the Health Belief Model

3.3. Study Design

The two major phases of the study were the developmental phase and the implementation phase. The developmental phase consisted of several activities to collect qualitative data to inform instrument development. These activities included focus groups, observed pretests and in-depth interviews, a pilot test, an alpha test and expert review. Seventeen students and five experts participated in this phase.

During the implementation phase, a cross sectional study design was implemented to test the study hypotheses. Students were randomly selected from a comprehensive list of freshmen living in university residence halls to be invited to participate in the study. Two hundred sixty five students volunteered to complete the survey. Survey implementation took place during the second semester of their freshman year (Spring 2004).

3.4. Study Population and Setting

The University of Maryland at College Park (UMCP) is a major public research university located on 1,500 acres along the Baltimore-Washington, D.C. high-tech corridor. The flagship of the University System of Maryland, UMCP is home to nearly 34,000 students. There are approximately 25,000 undergraduate students at UMCP composed of 51% men and 49% women. Approximately 32% of the student population is minority with 13% identifying as African American. Twenty-six percent of students are from out-of-state. Sixty percent of undergraduates receive financial aid. Thirty-four percent of undergraduates live in residence halls. Of the 25,000 undergraduate students, approximately 5,000 are freshmen enrolled in school full time (Office of Institutional Research and Planning [OIRP], 2003).

In this study, freshmen are defined as first year students. About 48% of freshmen are female and 53% are male (OIS personal comm. fax). Of full time freshmen, 13% are 17 years old, 81% are 18-19, and 5% are 20 or older. Many of the youngest and oldest students do not live on campus. About 90% (3,532) of full time freshmen live in UMCP residence halls (OIRP, 2003).

Rates of alcohol usage among students mirror national rates of college student alcohol use. Most UMCP students report having tried alcohol (75%) and getting drunk (65%) prior to the age of 18. In addition, most students (69%) report that alcohol is easy to access on campus. Students rate alcohol as the most widely accessible drug on campus. Most students (60%) do not disapprove of underage alcohol use. Most UMCP students (87%) reported using alcohol in the past year, making it the most widely used drug on campus. Many students (72%) report past month use. In addition, between 1991 and 1998 alcohol use increased among UMCP students, particularly among freshmen and sophomores. Sixty-seven percent of freshmen reported alcohol use in the last 30 days. Eighty-five percent of freshmen reported lifetime alcohol use (Leah McGrath, personal communication, Fall 2003).

3.5. Computer Access

For this study, participants completed web-based surveys. Therefore, it was necessary that students' could easily access the internet. UMCP students have access to a variety of first-rate technologies provided by the university for both personal and academic use. UMCP students are comfortable with and well versed in the use of such technologies. All students receive e-mail accounts upon entry to the University and over 95% of students access their accounts (Campus Assessment Working Group [CAWG], 1998). The accounts are used for general communication purposes, for accessing campus services such as registration, library searches and grade retrieval, and for communication with classmates and instructors. In the spring of 1998, there were 100 list serves and 61 mail reflectors devoted entirely to class e-mail (CAWG, 1998).

Students access these services at any one of the 30 University-run computer labs on campus or at their place of residence. All students in residence halls are provided with their own personal and free Internet connection for use with their personal computers. In the fall of 2001, 94% of residence hall students had registered their jacks and 86% reported regularly using a computer (for academic purposes) at their place of residence (CAWG, 1998).

3.6. Subject Selection and Recruitment

3.6.1. Development Phase

Seventeen second year students who were 18-20 years old and who lived in a residence hall during their first year of college were recruited to participate in developmental activities. Originally, it was planned that 22 students would participate in the developmental phase. However, due to problems with recruitment the investigator stopped recruiting at 17 students. However, as the data collected from developmental phase activities became repetitive, it is thought that collecting data from 5 fewer students than planned did not hamper the study development in any way. It was undesirable for students who participated in developmental activities to participate in the implementation phase. Second year students were able to reflect on their first year experiences in order to give meaningful input to survey development, yet they were not eligible for survey implementation. Thus, using second year students allowed the collection of useful developmental data without the need to screen out developmental participants from the implementation phase. Three focus groups (n=6, n=2, n=3) and one interview were

conducted to aid in survey development. The single person interview was conducted in the same manner as the focus groups except that there was only one person in attendance because the other person scheduled at that time did not show up. Five students participated in the observed pre-tests and in-depth interviews and four of these same students participated in the offsite pilot test. Because developmental recruitment proved more difficult than anticipated, the single focus group participant was not turned away and the students who participated in the observed pre-test and in-depth interviews were asked to participate in the pilot test. This was not considered a limitation since the goals of the two activities were different (i.e. assessing the ease of navigation vs. the proper technological functioning of the system). When individual developmental activities began to result in repetitive findings, it was determined that halting recruitment at 17 participants was justified.

Developmental phase participants were recruited from Health classes. After making arrangements with the class instructor, the investigator and research assistant recruited students during the first five minutes of class time. The investigator described the study and the developmental activities for which participants were being sought. She described the procedures to be used, the risks and benefits of participating, the voluntary nature of the study, and the right to withdraw. The investigator also described the incentive for participating (\$5 gift card). Developmental activities were scheduled to accommodate volunteers' schedules and were held in a private conference room or office. Prior to beginning an activity, the investigator reviewed the informed consent form with students. Students then signed the informed consent prior to initiation of developmental activities (Appendix A).

Students who participated in focus groups and observed pre-tests/in-depth interviews were mutually exclusive. That is, students who participated in the focus groups did not participate in the in-depth interviews. Students received a Barnes and Noble gift card worth \$5 for participating in any one developmental phase activity.

Five experts served on the expert panel. These experts also composed the dissertation examining committee. Their topics of expertise included adolescent and college health, alcohol use, parental involvement, survey and web-survey methodology, and structural equation modeling. Expert reviewers examined the entire study design and protocol and gave input into initial revision. As questions regarding questionnaire development, sampling, recruitment, and data analysis arose, the expert panel was consulted. For example, when a question regarding the face validity of the perceived risk scale arose the panel was consulted for appropriate revisions.

3.6.2. Implementation Phase

The sampling frame was a comprehensive list of all (n=1,933) full-time freshmen, 18-19 years old residing on campus and was obtained from the UMCP Office of the Registrar. The study was restricted to freshmen living in residence halls because they were likely to be different than off-campus students in their experience with parents and drinking. Students under 18 were excluded to protect their autonomy as they would need parental approval to participate. Computerized random sampling from the numbered sample frame was used to sample 467 students for recruitment. The list of eligible students obtained from the registrar was numbered and SPSS was used to generate a

random list of numbers. The students corresponding to the numbers generated were invited to participate in the study.

The listing obtained from the Office of the Registrar included each students' name, address, email address, phone number, sex, date of birth, major, SAT score, and college under which they study. The students randomly selected to participate received a personalized introductory letter printed on university letterhead by campus mail (Appendix B). The letter notified the participant that in two days time an email message would be sent to their student email address and that a hypertext link contained in the message, when clicked, would open their computer's web browser to the site hosting the survey. A copy of the informed consent form was attached to the letter and provided the details of the study (purpose of the study, risks, benefits, voluntary nature of the study, right to withdraw, incentives for participating). The letter also informed students that if they did not complete the survey within three days of receiving the email that they would receive reminder emails and telephone calls requesting their participation. The invitation letter also contained the investigator's email address and phone number for students to call if they wished to decline participation or if they had any questions about the study. A pen with "Maryland" printed on the side was included with the letter as a token incentive. Token incentives given to participants at the beginning of a study have been found to be more effective in attracting respondents than has a promise of a reward upon completion (Dillman, 2000; Edwards et al., 2002). Furthermore, the addition of the pen to the envelope created an irregularity in the package and was believed to arouse interest so that students would be less likely to discard the invitation (Dillman, 2000).

The email message containing the survey link was generated using mail merge software so that each message was personally addressed and sent individually, not as part of a bulk transmission. The email was sent two days after the letter was expected to arrive at the students' residence halls so that students could have an opportunity to read the letter and receive the token incentive. Copies of the letter and the informed consent form were attached to the email. A hypertext link email address for the investigator and the investigator's phone number was prominently displayed in the message to allow participants to make inquiries about the study. Email was anticipated to be a useful way to contact potential participants as it was the most common way University of Maryland students reported learning about campus programs, ranking ahead of posters, friends, newspaper, and mailings (McGrail, 1999).

If the student did not complete the survey within three days of receiving the email containing the hyperlink, they received another email. If within three days of the reminder email, the student still had not responded (and had not indicated that they did not wish to participate) they were telephoned by the investigator or the research assistant to check that they had received the email and they were asked if they were willing to participate. If the student was not available to take the call, the caller left a message on the student's voice mail or with the roommate. Immediately following the phone call, another email reminding students to complete the survey and emphasizing the importance of survey completion was sent. If a student declined participation, they were asked if they would like to give a reason why and they were taken off the contact list. They were not contacted again. This initial reminder phone call and email was followed by two more reminder phone calls and emails, each spaced a week apart. Originally, it was

planned that up to five phone calls would be made and that each reminder phone call would be spaced three days apart. The reduction in the number of reminders and the increase in spacing between reminders was implemented because, after conducting the first reminders, it was apparent from students' reactions to our inquiries that numerous and closely spaced reminders might aggravate potential participants rather than encourage them to participate. Thus, the intensity of the follow up was reduced in order to preserve the recruiters' relationships with potential participants. All correspondence with participants (email and phone) included a telephone number for participants to call if they had questions or concerns about the study.

Prior to completing the survey, students were required to consent to participation. When students clicked on the hyperlink sent in the email, the informed consent opened in their web browser. They were required to read through the on-line informed consent and electronically sign (click a box) the form indicating that they had read, understood, and agreed to the informed consent. They were then taken to the on-line survey.

3.7. Data Collection

3.7.1. Development Phase

Three, one hour focus groups (n=6, n=2, n=3) and one, one hour interview were conducted to aid in survey development. Focus groups involved planned and documented discussions among relatively homogeneous individuals (individuals who are likely to have had relatively similar experiences) around pre-specified topics of interest. The focus groups were intended to address two goals. First, the groups helped assess the

conceptual framework through which the draft survey was developed. Second, the groups served to assess the degree to which the instrument was comprehended in the manner intended. To accomplish these goals, students participated in group conversation regarding the survey and their feelings regarding parental influence over student drinking. Students also discussed their opinions, perceptions, attitudes, and beliefs regarding the role of parents in first year students' drinking behaviors. This discussion aided in determining the saliency and appropriateness of the questions posed in the survey. Next, students examined the draft survey to assist in assessing the face validity and clarity of questions, response options, questionnaire format and flow. These groups helped determine the revisions needed to make the survey easy for participants to complete and understand. The final topic guide for the focus groups is attached (Appendix C).

Focus groups lasted about one hour and were led by the investigator. For both focus groups, dialogue was recorded by an audiocassette and notes were recorded by a note taker. The focus group facilitator followed the agenda, covered all questions, established a tone that facilitated openness and discussion, and probed to ensure each question was fully discussed and that each participant's views were expressed. Probes included asking participants to elaborate on comments that were ambiguous or to clarify comments that were unclear. Probes also included providing participants with examples or more directed questions if the original open-ended question did not result in discussion. The note taker recorded verbal as well as non-verbal communication of the participants.

Following analysis of focus group data the survey was revised and converted to an on-line survey. It was pre-tested by having five students complete the survey and

submit results while being observed by the investigator. This observed pretest served as a check for difficulties in navigating, completing and submitting the survey. Before submitting the survey, students printed a hard copy of their responses so that reliable data transmission to the text file could be confirmed. Students then participated in individual, in-depth probed interviews regarding the ease with which they completed the on-line survey. The interviewer recorded notes. A summary of findings was prepared and the questionnaire was revised accordingly. The observed pre-test and in-depth interview lasted about one hour. The final in-depth interview guide is attached (Appendix D).

Finally, four of these five students completed another online survey from an offsite computer of their choice. The students again printed out a hard copy of their responses and returned it to the project office. The hard copy was compared to the data transmitted to the text file and the data emailed to the investigator. Acceptable reliability was a 100% match among all three data sources. Following electronic survey submission and receipt of hard copy data these students were contacted via email and were asked if they had any problems navigating and submitting the survey from the offsite location. The purpose of this was to identify any problems in remote submission so that they could be corrected prior to full survey implementation.

To test if the system was working as planned, two procedures were followed. First, after coding, an Alpha test was performed. In this test, seven different response sets were generated by the investigator. These were used to test all possible response options. Copies of each survey were printed prior to submission. The database was then checked to ensure that it contained the data entered by the investigator and that the data matched the data in the confirmation emails sent to the investigator. Acceptable

reliability was a 100% match among all three data sources (the database, the emails, and the data file). Once Alpha testing and pilot testing were completed and 100% reliability was achieved the data file was wiped clean (back to its NULL state) and the implementation phase was begun.

3.7.2. Implementation Phase

The Internet was used to conduct the survey online during the 2004 spring semester. Students received an email containing a hyperlink to the survey site and a unique password. The email informed students that they must complete the survey alone, that they should not share the survey URL or their password with anyone, and that in the event that they submitted more than one survey, only the first submission would be accepted. Students clicked on the hyperlink and their web-browser opened to the survey site. Students were first connected to the electronic informed consent. After agreeing to the consent form, they were taken to the survey. Students completed the 10-15 minute survey and entered their unique password sent to them in the recruitment emails. The use of a password enabled tracking of survey completion and, had any student submitted more than one survey, would have allowed identification of those participants. Once participants submitted a completed survey they were entered into a drawing for a \$100 gift card to Barnes and Noble.

Data collection forms were posted at a website created for this project. Answers were automatically entered into a project database on a server at the University of Maryland, eliminating the need for data entry and protecting the anonymity of respondents. The only required field was the password field. This was a required field to

allow the investigator to import the unique identifier, along with data, into the data file. Other than this item, participants could skip any question they did not wish to answer.

Four web-pages were created. These pages are, in order of appearance, the informed consent page, the survey page, the re-direct page, and the completed survey message page. The data file was also created.

The survey was programmed as a continuous form using Dreamweaver. Custom HTML was written using this program in order to create the survey. The HTML also communicated with BFORMAIL (described below). The custom code mandated the type of response options for each question (radio-button for questions with single choice required, checkbox for multiple response questions, text fields for open-ended data), the order in which the variables were written to a database (e.g. the password field appeared last on the survey form but was written first to the database), the name of the database the data was to be written to, the creation of confirmation emails to the investigator and the research assistant for each submission, the re-direct message that was used if the respondent failed to input their password, and the survey completion message page that was displayed in the browser when someone successfully completed the survey.

The instrument was coded to send a copy of the respondent's submission to the investigator and research assistant's email addresses. Using HTML, the web address for the re-direct page was also coded in the instrument. In the event that the participant did not enter her/his password on the survey form (required) they were taken to the re-direct page and saw a message informing them that they had not completed the required password field. They were instructed to use their browser's "back" button to return to the survey and input their password. Finally, the web address for the 'completed survey

message' page was coded in the instrument. When students clicked the submit button, this page appeared and displayed a thank you message to students for participating and informed them that their responses had been entered into the study database.

A text-based data file was also created. The text file was stored in the same directory as the instrument. This was a NULL file (i.e., contains no data) and the data file's characteristics was set to be write-enabled for public users. Write-enabling the file allowed data to be appended by a respondent upon submission. While several options were considered for appending each completed survey response to the end of an existing text file (e.g. Active Server Page Technology (ASP), Cold Fusion (CFM) combined with writing to a backend database such as ORACLE), an application called BFORMAIL was used for this purpose due to its relative simplicity. BFORMAIL was stored in the CGI-BIN of the server.

In order to backup data in case the text file was lost, two strategies were implemented. The text-based data file was copied to a secure location away from the server each night. Thus, in the event that the server crashed, no more than one day of data would be lost. Second, the emails automatically sent to the investigator and research assistant upon survey submission contained the data that was written to the text file. In the event that data from the text file were lost, this emailed data could have been re-entered into the database.

3.8. Response Rate

Out of the 467 students randomly selected for recruitment, 265 students completed the survey during the four weeks immediately following Spring Break. Thus, the

response rate was 57%. While the majority of students did not give any reason for not participating, some reasons were identified. Reasons given for non-participation included: 15 minute survey is too long (n=1), already completed another alcohol survey (n=1), too busy (n=5), questions are too personal (n=2), don't want to complete the survey (n=3), no interest in completing the survey (n=2), don't like participating in surveys (n=1), number of reminder calls were annoying (n=1), and not enough incentive (n=1). In addition, four students hung up on the recruiters.

3.9. Instrumentation

3.9.1. Operationalization of key variables

Problem Drinking: The Young Adult Alcohol Problems Screening Test (YAAPST) was modified to assess problem drinking in this study (Hurlbut & Sher, 1992). The YAAPST is a 27 item questionnaire that assesses lifetime, past year, and past year's frequency of negative consequences of alcohol use. This measure assesses the actual frequency of negative consequences (as opposed to perceptions of the frequency of occurrence, e.g. "moderate amount"). This is because it is not the perception of the occurrence of negative consequences that are risky but the occurrences themselves. The YAAPST was designed to specifically address negative consequences of alcohol use among college students. The YAAPST assesses traditional consequences (e.g. hangovers, blackouts, driving while intoxicated) as well as consequences that are presumed to occur at higher rates among college students (e.g. missing class, damaging property, getting involved in

regrettable sexual situations) (Allen & Columbus, 1995). In previous research, this measure has demonstrated adequate test-retest reliability (one year), internal consistency (Coefficient Alpha), content validity, criterion validity, and construct validity (Allen & Columbus, 1995).

For this study the first 20 questions of the YAAPST were adapted by reducing the number of response options and inserting the clause “as a UMD student” in each item. Thus, the final set of responses were 1 = “No, not while a UMD student,” 2 = “Once as a UMD student,” 3 = “Twice as a UMD student,” 4 = “Three times as a UMD student,” and 5 = “Four or more times as a UMD student.” The Problem Drinking score was computed as the sum of 20 items on which students reported the number of times each consequence of drinking had occurred to them as a UMD student so that a greater scale score indicated greater occurrence of problems. The seven yes/no questions included in the original YAAPST were not included in the creation of this scale because they used a different response scale and appeared to be diagnostic items for alcohol dependence (e.g. have you ever felt you needed alcohol or were dependent on alcohol?) whereas the 20 items used assessed strictly the occurrence of consequences (e.g. have you ever gotten into physical fights when you were drinking?).

As used in this investigation, the problems scale had good internal consistency (Cronbach’s Alpha = 0.87). For use as the dependent variable in the test of hypothesis one, problem drinking was dichotomized to compare those students who reported one or more problems to students who did not report any problems as it was highly skewed (skewness = -0.53, kurtosis = 0.52) and could not be used as the dependent variable in linear regression. Because robust estimation was used for path analysis and structural

equation modeling, for tests of hypotheses two through five problem drinking was used as a continuous variable. (Robust estimation allows for the use of non-normal variables in path analysis and structural equation modeling while linear regression requires the dependent variable to be relatively normal. Therefore, hypothesis one required that problem drinking be dichotomized and logistic regression be used).

Parent-Child Communication: Alcohol based parent-child communication was assessed using the Alcohol Based Parent-Teen Communication Scale developed by Turrisi et al. (2000). The scale contains 30 items that were developed based on the work of Jaccard and Dittus (1993) and Noller and Callan (1988) (Turrisi et al.). The content of the items was based on a literature review of adolescent alcohol use, alcohol expectancies, and mother teen relationships (Turrisi et al.). The scale format has been effectively used in research on adolescents in the sexual domain (R. Turrisi, personal communication, Fall 2003.). In a pilot study (n=100) conducted by Turrisi et al. the reliability of this scale (Cronbach Alpha) ranged from 0.53 to 0.75 with a mean = 0.64. In addition, in other previous research only one of the items was found to significantly correlate with a measure of social desirability tendencies ($r = -.25$) and it was in the opposite direction to what one would predict (R. Turrisi, personal communication, Fall 2003.). Previous research has also found that the scale correlates with drinking frequency ($r=0.45$), suggesting the measures have concurrent validity (R. Turrisi, personal communication, Fall 2003.).

During development, the reliability of the Turrisi scale was a concern. However, in a review of the literature, there were no other measures identified that addressed

parent-child communication specifically regarding the negative consequences of alcohol use. Therefore, it was decided that taking steps to improve the reliability of the Turrisi scale was preferable to creating a new measure. To this end, three items assessing parent-child communication regarding the negative consequences of alcohol that were used in the ASSESS study among adolescents aged 12-17 were added to the scale. These items were “How much has your parent talked with you about the effects of alcohol on making decisions?” “How much has your parent talked with you about the dangers of drinking and driving?” “How much has your parent talked with you about the risks of combining drinking and sex?” (Bradley Boekeloo, personal communication, Fall 2003).

For the current study the scale was adapted to include the timeframe of interest by adding the clause “Since I began school at the University of Maryland.” Example items include “Since I began school at the University of Maryland, my parent(s) and I have discussed how drinking could get me into trouble with the police,” “Since I began school at the University of Maryland, my parent(s) and I have discussed how drinking changes your personality,” “Since I began school at the University of Maryland, my parent(s) and I have discussed the negative consequences of mixing alcohol and sex.” Students responded to each item on an adapted five point response scale including the responses 5 = “not at all,” 4 = “A little bit,” 3 = “A moderate amount,” 2 = “Quite a bit,” and 1 = “A great deal.” These response options assessed the students’ perceptions of the magnitude of discussion. They did not allow direct assessment of the quantity and frequency of discussion. This is because students’ perceptions of their parents’ behavior appears to be more predictive of outcomes than actual parental behaviors. Because this investigation

focused on students' perceptions it is not of concern that students may report similar subjective amounts of discussion when actual frequency of discussion differs.

The 33 items were summed to create a scale. A higher scale score indicated *less* alcohol related parent-child communication. This scale had good internal consistency (Cronbach Alpha = 0.97). For the tests of hypotheses two through five this variable was rescaled by dividing scores by 100. This was necessary for path analyses and structural equation modeling because the variance of the communication variable was out of the range of the variances of the other variables in the analyses and most structural equation modeling packages have difficulty manipulating covariance matrices when variables' scales differ widely.

Parent-Child General Communication: In response to these findings from the focus groups, the questionnaire was revised by including the Parent-Adolescent Communication Scale (McCubbin & Thompson, 1987) to be able to explore whether general parent-child communication was related to problem drinking. This scale includes two subscales that examine communication patterns between parents and their children. The first subscale measures Problem Family Communication (e.g. "My parent tries to understand my point of view") while the second subscale measures Open Family Communication (e.g. "I can discuss my beliefs with my parent without feeling restrained or embarrassed"). As discussed in chapter two, families scoring better on this scale have been found to have children who have lower alcohol involvement. For each of the 20 items, students respond on a 5-point likert-type scale ranging from "strongly disagree" to "strongly agree." The scale has been found to have acceptable internal consistency

(cronbach's alpha = 0.78) (McCubbin & Thompson, 1987). The subscales are summed to create problem and open family communication scores.

Attitudes Toward Drinking: Attitudes towards drinking were assessed by having students rate alcohol on four semantic differential items adapted from Wall, Hinson, and McKee (1998). In previous research, when used with a sample of high school students this scale demonstrated good reliability (Cronbach Alpha = 0.87) (Williams & Hine, 2002).

Respondents were asked to indicate how they feel about alcohol on a five point scale on the following dimensions: 1 = "bad" to 5 = "good," 1 = "unpleasant" to 5 = "pleasant," 1 = "foolish" to 5 = "wise," 1 = "harmful" to 5 = "beneficial" (Wall et al., 1998). These items reflect the evaluation dimension of the semantic differential. The evaluation dimension is characterized by bipolar adjective pairs such as good-bad while the other two dimensions, potency and activity, are characterized by adjectives such as powerful-powerless and fast-slow, respectively. While only the evaluation dimension was assessed, it was proposed that in measuring attitudes, only the evaluation dimension needs to be considered (Heise, 1970). The items were summed to create an attitude scale with greater scores indicating more favorable attitudes toward alcohol. In the current study, this scale had good internal consistency (Cronbach Alpha = 0.89).

Parental Subjective Norm: Perceived parental approval of alcohol was assessed using six items adapted from the Monitoring the Future Study (Johnston et al., 2000) and Williams and Hine (2002). Students reported the extent to which their parents would approve of their occasional use of alcohol, their regular use of alcohol, and their regular heavy

drinking. These were assessed separately for mothers and fathers. There were three items for each parent. Students responded to these items on a 5-point scale ranging from 1 = “strongly disapprove” to 5 = “strongly approve.” Summative scores were created from these items for mothers and fathers. These scores represented students’ beliefs about their parents’ expectations. Students were also asked, “How important is your mother/father’s opinion to you?” Students responded to these two items on a 5-point scale ranging from 1 = “very important” to 5 = “not at all important.” This score represented students’ motivations to comply. The products of the motivation to comply and the summed score of students’ beliefs of their parents’ expectations were computed. These products represented the subjective norm. The products for mothers and fathers were summed. These scores were used in analyses (Ajzen, 1991; Williams & Hine, 2002; Glanz et al., 2002; Simons-Morton et al., 1995). Greater scale scores indicated a riskier parental subjective norm. In the current investigation this scale had good internal consistency (Cronbach Alpha = 0.89). (To obtain the estimate for Cronbach Alpha parental subjective norm was calculated by multiplying each parental expectation item by the corresponding motivation to comply item and then summing the products for each parent. The mother subjective norm score and the father subjective norm score were then summed.)

Perceived Risk: Perceived risk of drinking was measured by an adapted version of the Negative Expectancy subscale of the Comprehensive Effects of Alcohol Questionnaire (CEOA) (Fromme, Stroot, Kaplan, 1993). In the original negative expectancy subscale 18 items measure negative expectancy factors such as impairment, risk and aggression.

The stem “If I were under the influence from drinking alcohol” is followed by potential negative outcomes. The probability of experiencing the outcome is rated on a 4 point Likert-type scale ranging from disagree to agree. Individuals are also asked to provide a subjective evaluation of each effect on a five-point scale ranging from bad through neutral to good. The benefits of the CEOA include that all items focus on discrete rather than global effects of alcohol and all are worded to focus on a person’s own expectations rather than those of people in general. In previous research, the CEOA was demonstrated to have adequate levels of internal consistency, temporal stability, and construct validity. The positive and negative expectancy and evaluation scale scores have been found to be related to measures of quantity and frequency of drinking and weekly alcohol consumption among college students (Allen & Columbus, 1995). In a study conducted by Kuther and Higgins-D’Alessandro (2003) with eleventh graders, college freshmen and college seniors the reliability for this sub-scale was good (Cronbach Alpha = 0.78) (Kuther & Higgins-D’Alessandro, 2003).

To increase the face validity of this scale as one capturing perceived risk, the scale was modified. In the current study, students rated the perceived *likelihood* of occurrence on a five point scale ranging from 1 = “very likely” to 5 = “very unlikely.” Students then rated the seriousness of the outcome on a five point Likert-type scale ranging from 1 = “very serious” to 5 = “not at all serious.” The product of the likelihood and the seriousness ratings were computed and the products were summed across items. A greater scale score indicated less perceived risk. In addition, as the length of the survey was a concern, the number of perceived risk items was reduced. Instead of 18

items, a random sample of six items were selected. In this investigation the scale had good internal consistency (Cronbach Alpha = 0.87)

Parental Drinking: Parental drinking behavior was assessed using items borrowed from Williams and Hine (2002). The items asked students to report on their father and mother's alcohol use. For each parent students were asked, "How often does your father/mother have a drink of alcohol?" Students responded on a five point likert-type scale ranging from 1 = "never" to 5 = "very often." An additional response, "I don't have a mother/father" was included. Responses of "I don't have a mother/father" were treated as missing ($n_{\text{mother}} = 0$, $n_{\text{father}} = 6$). These two items were used individually in all analyses.

High School Drinking: To assess the extent to which students drank in high school students were asked two items. First, they were asked, "During your senior year of high school, how often on average did you drink alcohol?" Response options included 1 = "never," 2 = "monthly or less," 3 = "two or four times a month," 4 = "two to three times a week," and 5 = "four or more times a week." Students were also asked "On those occasions when you drank during your senior year of high school, how many drinks did you usually have?" Response options included 1 = "I didn't drink in high school," 2 = "1 or 2," 3 = "3 or 4," 4 = "5 or 6," 5 = "7 to 9," 6 = "10 ore more." These items were adapted from Yu and Shacket (2001). The choice of the senior year in high school timeframe provides respondents with a clearly set time frame in which to estimate their drinking in order to reduce possible memory decay, which may bias responses. This time

frame also focuses on the time in high school that is closest to college (Yu & Shacket, 2001). The product of these two items was computed and used to indicate the extent of high school drinking with greater scores indicating more frequent and/or greater quantities of drinking. Scores for students who reported incompatible responses to the quantity and frequency items (e.g. reported they did not drink in high school when asked about frequency of drinking and reported drinking one or more drinks per occasion when asked about quantity) were not computed and treated as missing in subsequent analysis ($n = 7$). Because about half of students ($n = 128$, 50%) reported that they never drank in high school or drank only one to two drinks per occasion once a month or less while in high school, the sample was dichotomized to compare these students with students who reported drinking in greater frequencies or quantities. This dichotomy was based on the distribution as well as the belief that the split represented an important qualitative difference in alcohol risk behavior.

High School Alcohol Related Parent-Child Communication: High school alcohol related parent child communication was assessed using three communication items that focused on the negative effects of alcohol. The items were adapted from the ASSESS project (Bradley Boekeloo, personal communication, Fall 2003). Students were asked, “Prior to beginning school at the University of Maryland, how much did your parent talk with you about the effects of alcohol on making decisions?” “Prior to beginning school at the University of Maryland, how much did your parent talked with you about the dangers of drinking and driving?” “Prior to beginning school at the University of Maryland, how much has your parent talked with you about the risks of combining drinking and sex?”

Response options included 5 = “not at all,” 4 = “A little bit,” 3 = “A moderate amount,” 2 = “Quite a bit,” 1 = “A great deal.” Scores on these items were summed to create a scale so that greater scale scores indicated *less* communication. In the current study, the internal consistency of this scale was good (Cronbach Alpha = 0.83).

Other Variables: Other variables measured include students’ age (18, 19), sex (female = 1, male = 2), involvement in intercollegiate sports (no = 1, yes = 2), and Greek organization membership (no = 1, yes = 2). Measures for these variables were borrowed from the National College Health Assessment, which is developed by the National College Health Association. These measures are extensively tested for reliability and validity (National College Health Association [NCHA], 2003). Ethnicity was also assessed using an item borrowed from the NCHA. Most participants reported that they were White (n = 180, 68%) as compared to Black (n = 30, 11%), Hispanic or Latino (n = 11, 4%), Asian or Pacific Islander (n = 31, 12%), American Indian or Alaskan Native (n = 0, 0%), or Other (n = 4, 2%). Eight participants reported that they described themselves as having two races, four of which included White as one of their races. One participant described him/herself as being three races, Black, Asian, and Other. Because of the small percentage of participants reporting races other than White, these participants were collapsed into one “Non-White” group. All subsequent analyses including race compare White participants (1) to Non-White participants (0). The White participant group includes the four students who reported that they were White and some other race.

Two items were developed to assess the physical proximity of parents. Students were asked, “Where is your permanent residence?” There were four response options

ranging from 1 = “within ½ hour drive of the university” to 5 = “more than 5 hour drive from the university.” Twenty-nine percent of students reported that their permanent residence was within a half hour drive of the university. Thirty-nine percent, 10%, 14%, and 8% reported that their permanent residence was within a 1 hour, 2-3 hour, 3-5 hour, or 5 or more hour drive from the university respectively. Therefore, the distance variable was dichotomized so that students whose residence was within a one hour drive of the university were compared to students whose residence was further than a one hour drive. This dichotomy was based on the distribution as well as the belief that a one hour drive or less is qualitatively different from a two or more hour drive based on the ease with which students can return home and possibly interact with parents. SAT scores for each participant were obtained from the Registrar. For the tests of hypotheses two through five SAT score was rescaled by dividing the scores by 1000. This was necessary for path analyses and structural equation modeling because the variance of the communication variable was out of the range of the variances of the other variables in the analyses and most structural equation modeling packages have difficulty manipulating covariance matrices when variables’ scales differ widely.

3.9.2. Reliability and Validity

The instrument was created especially for this study. Most of the measures were adapted from other sources. The developmental phase activities were aimed at increasing confidence in the reliability and validity of measures and measures with established reliability and validity were used as much as possible. However, the reliability and validity of most measures were estimated using data collected with paper-based

instruments. By using an alternate instrument format (i.e. web-based rather than paper-based survey) it was possible that the measures' reliabilities and validities would be altered. Therefore, post-hoc tests were conducted to determine the reliability of the measures as they were used in this study. The final survey is attached (Appendix E).

3.9.3. Quality of self report

Health Behaviors including alcohol use are usually measured among young people by administering self report questionnaires. The validity of these reports may be compromised by recall difficulty, the sensitivity of the questions, or by tendencies related to social desirability (Brener, Billy, Grady, 2003). Most data obtained from self report can't be verified independently due to feasibility and cost constraints (Brener et al., 2003). Regarding alcohol use among adolescents, there is evidence that shorter recall periods lead to more accurate reporting. In addition, the mode of questioning also appears to impact the validity of reporting among adolescents. It appears that the more privacy offered by the questioning method, the more valid the reporting. For example, computer assisted self-interviewing appears to elicit more reliable reports of alcohol use than interviewer administered questionnaires. Furthermore, mode effects are greater for drugs that carry the most legal sanctions. For example, among adolescents, mode effects are greater for cocaine than for alcohol (Brener et al.). Likewise, data from the Youth Risk Behavior Survey (Brener et al.) and other prior studies (Boekeloo, Schamus, Simmens, Cheng, 1998) suggest that older adolescents can reliably report substance use when measures are confidential and questions are carefully worded for appropriateness to the target population. Although the accuracy of a single individual's report may be

difficult to determine, from a group perspective, self reports of alcohol use are fairly accurate when people are interviewed under good conditions (Allen & Columbus, 1995). In this survey, the time frame of interest was relatively short (seven months), the use of a web-based survey ensured participants high levels of privacy, and, as much as possible, the survey questions were from standardized measures that have demonstrated validity and reliability in previous research with similar populations.

3.10. Analysis

3.10.1. Developmental Data

Note based analysis was used to analyze the focus group data. This method of analysis relies primarily on field notes, a debriefing session, and summary comments. While the focus group was taped, the tape was intended to be referred to in order to verify statements if needed. Also, the tape would be available if more rigorous analysis was needed later (Krueger, 1994). This type of analysis is less rigorous and time intensive than tape or transcript based analysis but more rigorous and time intensive than memory based analysis (Krueger, 1994).

Content analysis was performed on the data from the conceptual phase of the focus groups. In this procedure, important examples, themes and patterns were identified (Patton, 1987). This was done by reading through the notes and manually organizing the data into topics (Patton, 1987). A second coder reviewed the notes and the topics identified by the first coder. The two coders discussed any areas in which they did not agree on the identified topic until a resolution was achieved and a mutually agreeable

topic was identified (Patton, 1987). The topics were reviewed to identify common themes arising within the transcript. A theme is a broader, more conceptual category into which topics can be classified. In the same manner as with topics, two coders were required to agree on arising themes. The themes and patterns that arose from the inductive analysis of the conceptual phase were used to revise the questionnaire by informing the removal and addition of questions. Item removal or addition that was suggested by the focus groups had to be supported by the literature to warrant inclusion or exclusion.

To analyze the data arising from questions regarding survey comprehension, suggestions arising from the participants that were deemed appropriate and important by two analysts were used to revise the survey. Those suggestions that arose in more than one focus group were automatically used to revise the survey

Similar suggestions for survey revision arising from focus groups, observations and suggestions arising from the observed pretest and in-depth interviews that were deemed appropriate by two analysts were used to revise the survey. Those suggestions arising in more than one observed pretest and interview were automatically used to revise the survey. All suggestions recommended by the expert panel were automatically used for survey revision. All errors in coding identified in the Alpha test were corrected in the on-line survey. Results of pilot test data submission and emailed queries were reviewed for problems.

3.10.2. Data Cleaning

After data was downloaded into a statistical software program it was cleaned. Data cleaning involves examining outliers and missing data for errors in response or

entry. This step was minimal because response errors were eliminated with the use of the web-based survey functions and because data entry was eliminated by downloading data directly into the statistical software program.

3.10.3. Characteristics of Participants vs Non-participants

Participants were compared to non-participants on several variables including sex, residence hall style, living in honors residence halls, residing in a living learning community hall, having declared a major, college of study, and SAT score. Chi Square tests were used to compare participants and non-participants on dichotomous measures while t-tests were used to compare the two groups on continuous measures. The alpha level for a significant difference between groups was set at 0.05.

Descriptive statistics were generated for each key variable. These included frequency distributions, ranges, minimum and maximum scores, means and standard deviations. These statistics assisted in making decisions regarding how each variable was used. For instance, there were extremely low frequencies of ethnic categories other than “White.” Therefore these categories were collapsed into a “Non-White” category to allow their use in analysis. Post-hoc tests of internal consistency for multi-item measures were conducted using Cronbach Alpha. Acceptable reliability was indicated by a Cronbach’s Alpha greater than or equal to 0.75. This cut-off was determined from guidelines set forth by Nunnally (1967). These guidelines state that in the early stages of predictive and construct validation research a modest reliability of 0.70 may be acceptable (Nunnally, 1967). Furthermore, while reliabilities of 0.80 may not be high enough when trying to make decisions regarding individuals (as opposed to groups), increasing reliabilities

much beyond 0.80 in basic research is often wasteful (Nunnally, 1967). Thus, in addition to the argument that 0.75 is the conventional cut-off for acceptable reliability, because of the early stage of the present research and the newness of the survey instrument and the desire only to distinguish between groups and not individuals, the cut-off for acceptable reliability was set at 0.75. Descriptive statistics were generated using SPSS version 10.0.

3.10.4. Bivariate Correlations

Because all variables were identified as either continuous or dichotomous, bivariate associations were tested using Pearson correlation coefficients. (Because of the exploratory nature of the study, Pearson correlations were used on continuous variables and ordinal variables (with 5 point scales) with non-normal distributions.) Type II error was of greatest concern as this was an exploratory study and it was undesirable to miss an association between variables that could be explored further and in more detail in later investigations. Thus, the level of significance was set at 0.05. Even variables that were not significantly correlated ($\alpha = 0.05$) with the outcome of interest were included in multivariate analyses. This is because if the direct, indirect, and/or spurious relations in the path model are of competing signs, it is possible that a significant total correlation between the variable and the outcome may be canceled out. Thus, all variables of interest for multivariate analyses were included in analyses regardless of their statistical significance with the outcome variable in bivariate analyses. Bivariate statistics were generated using SPSS version 10.0.

3.10.5. Hypothesis Testing

The following analyses were performed to test each of the study hypotheses:

Hypothesis 1: Students' perceptions of post-matriculation parent-child communication regarding the negative consequences of alcohol use are protective against problem drinking among college students.

Logistic regression was used to test the relationship between parent-child communication and problem drinking. Student age, sex, and ethnicity were included in the model. Other confounding factors such as SAT score, parental drinking, distance from parents, involvement in sports, Greek organization membership, high school parent-child communication and high school drinking were also included in the model so as to control for their effects. These variables were chosen as covariates because, based on the literature, they were believed to be related to both parent-student communication and problem drinking and therefore, without statistical control, would increase the likelihood that a relationship between communication and problem drinking was spurious or confounded. The alpha level for the significance of each predictor was set at 0.05. Regression analysis was conducted using SPSS version 10.0.

Hypotheses 2-4

Hypotheses 2-4 were tested using the EQS statistical package to perform path analysis and structural equation modeling. Path analysis is a “process of hypothesizing a model of causal (structural) relations among measured variables (Hancock & Mueller, 2003).” These relations are often depicted in a path diagram. The data is then examined

to determine the extent to which it fits the hypothesized relationships. The path diagram is composed of the variables of interest and their hypothesized relationships.

Hypothesized relationships are depicted by arrows, or paths, connecting the variables in ways that represent the hypothesized directions and magnitudes of the causal relations.

Unstandardized paths are similar to unstandardized partial regression weights.

Standardized path coefficients are similar to beta weights in multiple regression. Two headed arrows represent covariance between two variables (Hancock & Mueller, 2003).

Structural equation modeling is like path analysis except that in SEM the variables of interest are constructs or latent variables, derived from the measured variables.

The relations in the hypothesized path or structural equation models are expressed using structural equations, regression type equations that express each endogenous (dependent) variable as a function of its direct causal inputs. These structural equations have implications for the variances and covariances that should be observed in the data according to the hypothesized relations. Thus, each parameter is expressed as a function of the covariances or variances of the observed variables (Hancock & Mueller, 2003). A just-identified model is one in which the system of relations can be uniquely solved for the unknown parameters. An over-identified model is one in which multiple expressions exist for one or more parameters. An under-identified model is a model in which some or all of the parameters “cannot be estimated on the basis of data alone (Hancock & Mueller, 2003).”

Statistical tests can be performed to test the fit between the observed data and the hypothesized model. There are three categories of fit indices through which such assessment can be made. These are absolute fit indices, parsimonious fit indices, and

incremental fit indices. Absolute fit indices such as the model Chi Square statistic, the Standardized Root Mean Square Residual (SRMR), and the Goodness of Fit Index (GFI) improve as the discrepancy between the observed and reproduced (co)variances decrease. These fit indices tend to improve as the complexity of the model increases. Parsimonious fit indices, such as the Adjusted Goodness of Fit Index (AGFI) and the Root Mean Square Error of Approximation (RMSEA) “take into account not only the overall absolute fit but also the degree of complexity required to achieve that fit (Hancock & Mueller, 2003).” These indices indicate the best model fit when there is good absolute fit and the models are relatively simple (i.e. have few parameters). Incremental fit indices, such as the Normed Fit Index (NFI) and the Comparative Fit Index (CFI) test the fit of the model in relation to a baseline model with fewer parameters. Joint criteria for acceptable fit have been suggested by Hu and Bentler. This criteria requires a CFI ≥ 0.96 together with an SRMR < 0.09 (or with RMSEA < 0.06) (Hancock & Mueller, 2003).

A model that has an acceptable fit indicates that the current path model can be retained as one of the many possible explanations of the data. Even if the current model does not have an acceptable fit, the model may be retained and modified post hoc based on the current data. A-theoretical modifications are strongly cautioned against. Furthermore, following modification, subsequent fit results may be due to chance rather than true model improvements. Therefore, modified structures should be cross-validated with an independent sample (Hancock & Mueller, 2003). In this investigation, the models are just-identified and so all variables are hypothesized to covary with all other

variables. Thus, the hypothesized models will fit the data perfectly and there is no need to examine fit indices.

When a satisfactory data-model fit is obtained, conclusions may be drawn about specific model relations. Direct effects, indirect effects, and total effects may be derived. For just and over-identified models, parameter estimates can be obtained through estimation methods such as maximum likelihood and generalized least squares. These estimation methods iteratively minimize a function of the discrepancy between the observed (co)variances and those reproduced by a substitution of iteratively changing parameter estimates into the model implied relations (Hancock & Mueller, 2003). The maximum likelihood estimation procedure selects parameter estimates so as to maximize the likelihood of the observed data and is robust to violations of normality (Loehlin, 1998).

For each of the hypotheses 2-4 depicted below, four models were tested using path analysis or structural equation modeling. For each hypothesis, the first model tested was a path model without control variables. The second model tested was the path model including controls. The third model was the structural equation model, which corrected for the unreliability of measures, without controls. The fourth model was the structural equation model with controls. The use of structural equation modeling allows the reliability of measures to be corrected. Structural equation modeling uses latent variables that are derived from the measured variables. To correct for the reliability of the measures, the error variance for each measured variable was fixed so that $\text{Var}(E) = (1 - \alpha)\text{Var}(V)$. The paths from the latent variables to the measured variables and from the errors to the measured variables were fixed at one. The variance of the reliability

corrected latent variable could then be estimated by the program and used in the model to obtain estimates of the paths. Because many of the variables were non-normal, the maximum likelihood, robust estimation procedure was used for these analyses. Controls included in the models were: age, sex, White, mother's drinking, father's drinking, distance of permanent residence, membership in an intercollegiate sports team, Greek organization membership, parent-teen communication about alcohol during high school, high school drinking, and SAT score. These variables were chosen as covariates because, based on the literature, they were believed to be related to both parent-student communication and problem drinking and therefore, without statistical control, would increase the likelihood that a relationship between communication and problem drinking was spurious or confounded. For all models, path values were obtained from the standardized solutions. The direct and indirect paths were tested for significance. The alpha level to identify significant paths was set at 0.05. Each hypothesized model is displayed below as a path model without controls.

Hypothesis 2: The relationship between students' perceptions of parent-child communication and problem drinking are mediated by parental subjective norms and attitudes towards drinking (Theory of Reasoned Action Model).

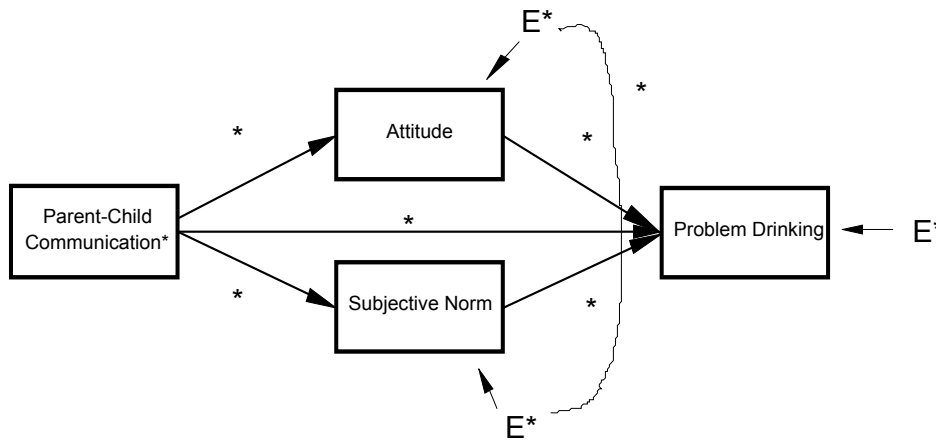


Figure 3.5. Relationship between parent-child communication and problem drinking mediated by attitude toward drinking and subjective norm

Hypothesis 3: The relationship between students' perceptions of parent-child communication and problem drinking is mediated by perceived risk (Health Belief Model).

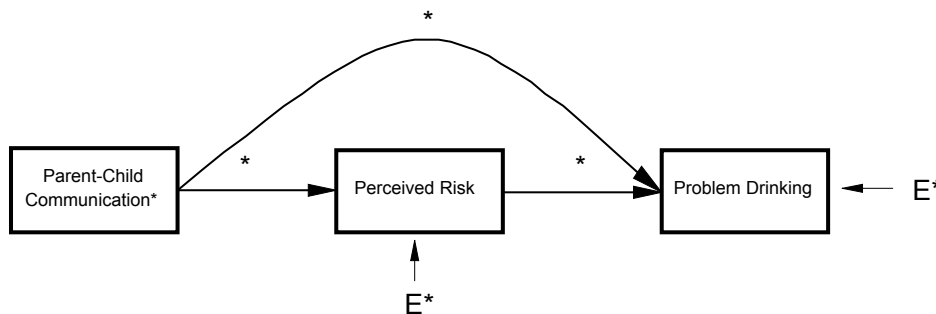


Figure 3.6. Relationship between parent-child communication and problem drinking mediated by perceived risk

Hypothesis 4: The relationship between students' perceptions of parent-child communication and problem drinking are mediated by parental subjective norms,

attitudes towards drinking, and perceived risk (Additive model using constructs borrowed from both the Theory of Reasoned Action and the Health Belief Model).

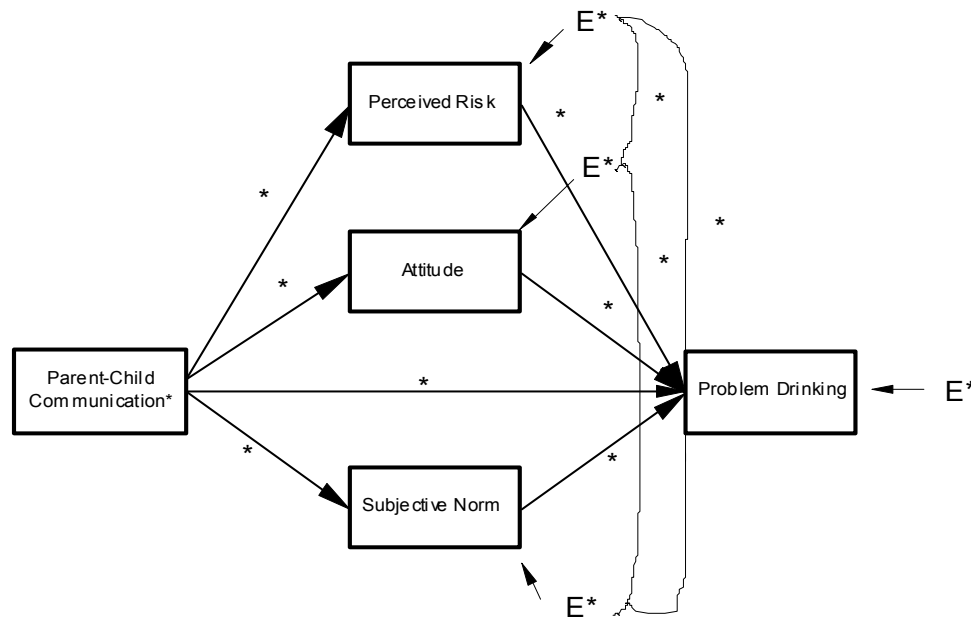


Figure 3.7. Relationship between parent-child communication and problem drinking mediated by perceived risk, attitude and subjective norm.

Hypothesis 5: The relationship between students' perceptions of parent-child communication and problem drinking are best explained by the additive path model utilizing constructs borrowed from both the Theory of Reasoned Action and the Health Belief Model.

The plan to test hypothesis 5 was to compare the three structural equation models comparable to the path models displayed above. Using the structural equation models with the corrected reliabilities allowed paths to be compared across models without the

danger of incorrectly concluding one path was smaller than another when in reality the difference in magnitude was only due to a difference in the reliability of the measures. Hypothesis 5 would be supported if the direct path between parent-child communication and problem drinking in the additive model based on the Health Belief Model and the Theory of Reasoned Action was statistically significantly smaller ($\alpha = 0.05$) than the direct path between parent-child communication and problem drinking in the other two models. This method of comparison was chosen because, since all models are just identified and differ only by their theoretical mediators, differences in the magnitude of the direct path between communication and problem drinking would only be due to differences in the amount of variance explained in problem drinking by the respective theoretical mediators. Thus, the more variance that was explained by the theoretical mediators, the less variance there would be for the direct path between communication and problem drinking to “clean up.” Greater explanation of variance by the theoretical mediators, in turn, indicates a better explanation of problem drinking.

3.11. Human Subjects

Seventeen second year students between the ages of 18-20 years were recruited to participate in developmental phase activities such as focus groups, observed pretests and in-depth interviews, and a pilot test. These activities were used to develop the study survey. Two hundred sixty-five students were enrolled in the survey study. There were no exclusions based on sex or ethnicity. Freshmen under the age of 18 were excluded from the study. Nineteen percent of the freshmen class were under the age of 18 (OIRP, personal communication, Fall 2003). Students were recruited from a list of all freshmen

living on campus obtained from the Registrar. Eligibility criteria included being a first year student and living on campus in university housing.

In the development phase, students were asked to participate in focus groups, observed pre-test/in-depth interviews, and a pilot testing of the on-line survey. During the implementation phase students completed a web-based survey. All data was self reported by participants.

Freshmen students were identified for participation through records from the University Registrar. Eligible students received a letter inviting them to participate and a pen as a token incentive. A copy of the informed consent form was included with the letter. Students then received an email with a link to the web survey and a unique password for accessing the survey. The invitation letter and informed consent form were also attached to the email for reference. The university IRB approved all recruitment and data collection procedures before they were implemented. Participation in the study was completely voluntary. Students who participated in the developmental activities received a \$5.00 bookstore gift coupon. Students who were invited to participate in the survey received a token incentive (pen) with their invitation letter and students who completed the survey were entered into a drawing to win a \$100 bookstore gift coupon.

Risks to participants were minimal. Possible risks were psychological in nature. It is possible that students could have become upset as a result of discussing alcohol use in developmental activities or completing a survey about alcohol use. The University of Maryland has a large, nationally recognized on-campus health center with health education and mental health resources. Guides and contact information for these resources were available to any study participant seeking such information.

Confidentiality of student reported data was maintained at all times. Hard copy informed consents and pre-testing data were stored under lock and key at the University of Maryland's Laboratory for Health Behavior Assessment and Intervention.

Undergraduate students did not serve in data collection capacity. Students were reminded of the voluntary nature of their participation. Consent forms were kept separate from hard copy and computer data. Pre-testing data was stored without personal identifiers. Computer data files were also devoid of personal identifiers and subject data was assigned a unique identifier developed only for study purposes. Computer data files were password protected. Only the investigator and three advisors knew the location of the text data file on the server.

Students did not directly benefit from participation in this study. However, findings from this study may help prevent alcohol problems among college students in the future.

The Institutional Review Board application for this proposal is attached (Appendix F).

IV) RESULTS

4.1. Developmental Activities

4.1.1. Focus Group Results

The first round of coding of the focus group data resulted in the identification of nine topics/categories. These were: 1) general parent-student communication, 2) parent-student discussion of negative alcohol consequences, 3) parent-student discussion of alcohol related skills, 4) parental monitoring of student behavior specific to drinking while at school, 5) parental drinking, 6) parental permissiveness over the lifespan, 7) the quality of the parent-student relationship, 8) parental attitude toward college drinking, and 9) distance of students from parents.

Each of the 9 topics/categories were examined for overarching themes. Fifteen overarching themes emerged (Table 4.1.). In general, the most pervasive message found in the focus group data was that college students want to live up to their parents' expectations and that communication between parents and students while students are at school may have an impact on drinking. Specifically, open communication with parents about students' lives in general was thought to be important. In addition, students believed that communication about negative alcohol consequences has the potential to be protective against problem drinking, unlike communication about alcohol related skills or monitoring students' specific drinking behaviors.

Table 4.1. Overarching themes arising from focus group analysis

| |
|--|
| <ol style="list-style-type: none"> 1. General, open-communication is protective against alcohol related problems 2. Students want their parents to trust them 3. Students want to live up to their parents' expectations of them. 4. Students want to know their parents are there as a "safety net" in case they have drinking problems 5. Parents often tell students to "be careful," "be safe," or "be responsible" without being specific as to what they are referring to 6. Students think parents could protect against alcohol problems by telling students <i>why</i> they should be careful, not just telling students not to drink 7. Parents and students tend to feel that students should learn from experience and from their own mistakes 8. Students learn from observing other's mistakes and consequences or hearing examples of other's mistakes and consequences. Parents should give students examples of themselves and others. 9. Alcohol related skills, such as pacing oneself, eating before drinking, etc. are better heard from peers and siblings, not from parents. Skills messages coming from parents would send the "wrong message." 10. Students want their parents to talk with them about students' lives to show they still care 11. However, monitoring specifically about drinking behaviors would end communication between parents and students. 12. Parental strictness over the course of a child's lifetime may lead to rebellion. 13. A good parent-child relationship which may protect against problem drinking in college, is developed over the lifetime of the child. 14. Parents know that their college children drink and are generally accepting of college drinking; They just don't want students to suffer adverse consequences from drinking. 15. The greater the distance from home, the harder it is for parents to influence their college students' choices about drinking. |
|--|

In response to these findings from the topical questions, the questionnaire was revised by including the Parent-Adolescent Communication Scale (McCubbin & Thompson, 1987) to be able to explore whether general parent-child communication was related to problem drinking. This scale was included and intended for use only in

secondary analyses if desired and was not germane to the study. The hypotheses established a priori were not revised.

The content analysis of questions regarding survey comprehension resulted in several changes to the survey. First, the Attitude Toward Alcohol semantic differential scale was revised. Participants suggested adding several more gradations between the opposing words (good/bad, pleasant/unpleasant, favorable/unfavorable, foolish/wise). Thus, instead of dichotomous response options, the revised scale included response options ranging from 1 to 5. The response set for the first 20 questions of the YAAPST was also revised. The number of response options were reduced and the clause “as a UMD student” replaced “in the past school year” in each response. Thus, the final set of responses were “No, not while a UMD student,” “Once as a UMD student,” “Twice as a UMD student,” “Three times as a UMD student,” and “Four or more times as a UMD student.” In addition, every inquiry about parents was changed to an inquiry regarding parent(s)/guardian(s). Wording and formatting/aesthetic changes were also made throughout the survey.

4.1.2. Observed Pretest with Interview, Pilot Test, and Alpha Test Results

Most of the changes arising from the pre-test and in depth interview were in regard to question wording, direction clarification, or formatting/aesthetics. One major problem with the on-line survey was identified during the observed pre-test. Participants entered their password at the top of the survey screen and would immediately press “Enter.” This would cause the survey to be submitted without any data. To alleviate this problem, the password field was moved to the end of the survey, immediately prior to the

“Submit Survey” button. This placement would accommodate any user who entered their password and hit “Enter” as they would have already completed their survey form.

The hard copy data from the observed pre-test, the off-site submission and the investigator conducted alpha test were compared to the data written to the data file and to the back-up emails. The system was determined to be functioning properly. When emailed, the four pilot test participants reported that completing the survey at the off-site locations was a positive experience and there were no problems or issues reported.

4.1.3. Results of Expert Review

Expert review informed several other changes to the survey. First, the response options for the last seven questions of the YAAPST were modified. The response options were changed from “No, never,” “Yes, but not in the past school year,” and “Yes in the past school year” to “No, not while a UMD student” and “Yes, as a UMD student.” Next, the response option “Somewhat” in the scales regarding parental discussion (both prior to beginning school at UMD and after matriculation) was changed to “A little bit” to be consistent with the other options that connoted quantity.

Because the survey was delayed and would be conducted after spring break, rather than prior, four questions regarding drinking behaviors over the recent break were added. These questions were modeled after the Daily Drinking Questionnaire items. The items addressed the number of days students drank during break, the number of days on which students drank five or more drinks during break, the number of drinks students had per day when they were drinking over break, and where students spent their break (at home, on vacation with family, on vacation with college friends, on vacation alone, on

vacation with non college friends). These variables were meant to be used if necessary to inform survey results as part of secondary analysis. Their inclusion did not indicate any modifications to the hypotheses established a priori.

The placement of several sets of questions was also changed. The questions regarding high school drinking and parent-child communication were placed first on the survey. Next, the questions regarding spring break were positioned. Finally, a clause was inserted explaining to participants that the remaining questions asked about their lives on or off campus since they became a UMD student and that the remaining questions were not about breaks, when school is not in session. This was done so that all questions referring to the same time frame were placed together allowing students to reflect on their behaviors in a context of time thereby increasing confidence in the reliability and validity of the data.

The measure of perceived risk, the Negative Effects subscale of the Comprehensive Effects of Alcohol Questionnaire (CEOA) was also modified based on expert review. Upon examination by the panel of experts, the items were determined to lack face validity as a measure of perceived risk (perceived susceptibility and perceived severity). The experts came to consensus on a revision of the response scale that would improve the face validity. Thus, the response options were changed for both the items assessing participants' expectations regarding the effects of alcohol and their subjective evaluations of those effects. The expectancy items asked participants about the likelihood of experiencing specific effects from alcohol and the response options were changed from a four point likert scale ranging from "Disagree" to "Agree" to a five point likert scale ranging from "Very unlikely" to "Very likely." The subjective evaluation

items asked students to rate the seriousness of each consequence and the response options were changed from a five point likert scale ranging from “Bad” to “Good” to a five point likert scale ranging from “Very serious” to “Not at all serious.” Thus, the items more accurately reflected the constructs of perceived susceptibility and severity as described in the Health Belief Model. In addition, as recommended by the expert panel, the number of perceived risk items was reduced as the length of the survey was a concern. A random sample of six items were selected from the original sixteen. Based on expert review ,four other questions were also eliminated for the sake of survey length. These were the measure of current relationship status, number of hours worked per week for pay, number of hours per week spent volunteering, and college of enrollment and major.

4.2. Characteristics of Participants and Non-Participants

Characteristics of participants and non-participants are displayed in Table 4.2. Sample characteristics for scaled variables are displayed in Table 4.3. Participants were more likely to be female (n = 172, 65%) and to reside in a living learning community (n = 171, 65%) than non-participants. There were no differences between participants and non-participants on residence hall style, living in an honors residence hall, having declared a major, college of study, or SAT score. The majority of the sample was 18 years old (n = 209, 79%) and female (n = 172, 65%). Most participants reported that they were White (n = 184, 69%).

Almost half the sample reported that their mothers drink Sometimes, Frequently, or Very Often (n = 116, 44%). Greater than half of the sample reported that their fathers drink Sometimes, Frequently, or Very Often (n = 170, 66%). Most students (n = 178,

68%) reported that their permanent residence was within a one hour drive of the university. Most students also reported that they did not belong to an intercollegiate sports team ($n = 247$, 95%) or a fraternity or sorority ($n = 236$, 90%). The mean SAT score was 1227.96 ($SD = 117.04$).

The distribution of scores on the High School Communication about Alcohol with Parents scale was nearly normal with scores ranging from 3 to 15 (mean = 10.52, $SD = 3.13$). Half of the students ($n = 128$, 50%) reported that during their senior year of high school they never drank or they drank only one to two drinks per occasion once a month or less. The other half of students reported drinking greater quantities and/or more frequently.

Scores on the measure of Alcohol Communication with Parents since students began school ranged from 30 to 150 and was skewed towards less communication (mean = 131.55, $SD = 22.45$). The most common topics of alcohol communication were those regarding the risks of riding in a car who has been drinking ($n = 184$, 70%), the importance of a healthy lifestyle ($n = 177$, 67%), the importance of not being pressured by others into drinking ($n = 128$, 49%), the dangers of drinking and driving ($n=126$, 47%) and how difficult it is to make accurate judgments of how drunk you are ($n = 120$, 46%) (Figure 4.1.). Students' reported attitude toward alcohol was normally distributed with scores ranging from 4 to 20 (mean = 11.86, $SD = 3.64$). The measure of perceived risk was nearly normally distributed with scores ranging from 6 to 150 (mean = 44.90, $SD = 21.46$). The measure of parental subjective norm was skewed towards a less risky subjective norm with scores ranging from 6 to 102 (mean = 22.52, $SD = 15.30$).

Alcohol Problems was skewed towards fewer problems with scores ranging from 20 to 74 (mean = 26.38, SD = 8.18). Most students (n = 165, 69%) reported that they had experienced at least one consequence from drinking alcohol in the past school year. The most common types of consequences included having a headache or hangover the morning after drinking (n = 147, 56%), feeling very sick to the stomach or throwing up after drinking (n = 138, 52%), being unable to remember the night before when awakening after drinking (n = 112, 43%), not going to work or missing classes (n = 76, 29%), and getting into regretted sexual situations because of drinking (n = 71, 27%) (Figure 4.2).

Table 4.2. Characteristics of Participants and Non-participants

| Characteristic | Participants N=265 N(%) | Non-participants N=202 N(%) | p Value ¹ |
|--|-------------------------------|-----------------------------------|----------------------|
| <u>Sex</u> | | | |
| Male | 93(35.1) | 113(55.9) | .000 |
| Female | 172(64.9) | 89(44.1) | |
| <u>Age</u> | | | |
| 18 | 209(79.2) | NA | NA |
| 19 | 55(20.8) | NA | |
| <u>Ethnicity</u> | | | |
| White | 184(69.4) | NA | NA |
| Non-White | 81(30.6) | NA | |
| <u>Residence Hall Style</u> | | | |
| Traditional | 261(98.5) | 197(43) | .588 |
| Suite or Apartment | 4(1.5) | 5(56) | |
| <u>Living in Honors Residence Halls</u> | | | |
| No | 172(64.9) | 125(61.9) | .501 |
| Yes | 93(35.1) | 77(38.1) | |
| <u>Living in Living Learning Centers²</u> | | | |
| No | 94(35.5) | 97(48.0) | .006 |
| Yes | 171(64.5) | 105(52.0) | |
| <u>Declared Major</u> | | | |
| No | 92(34.7) | 79(39.1) | .329 |
| Yes | 173(65.3) | 123(60.9) | |
| <u>College of Study</u> | | | |
| Agriculture & Natural Resources | 11(4.2) | 3(1.5) | .384 |
| Architecture, Planning & Preservation | 1(0.4) | 1(0.5) | |
| Arts and Humanities | 21(7.9) | 12(5.9) | |
| Business | 19(7.2) | 14(6.9) | |
| Behavioral & Social Sciences | 33(12.5) | 14(6.9) | |
| Computer, Mathematical & Physical Sciences | 12(4.5) | 11(5.4) | |
| Education | 16(6.0) | 8(4.0) | |
| Engineering | 30(11.3) | 27(13.4) | |
| Health & Human Performance | 4(1.5) | 3(1.5) | |
| Journalism | 7(2.6) | 10(5.0) | |
| Life Sciences | 19(7.2) | 20(9.9) | |
| Letters and Sciences (Undeclared) | 92(34.7) | 79(39.1) | |

Mother Drinks

| | | |
|------------|----------|----|
| Never | 53(20.0) | NA |
| Rarely | 96(36.2) | NA |
| Sometimes | 75(28.3) | NA |
| Frequently | 32(12.1) | NA |
| Very Often | 9(3.4) | NA |

Father Drinks

| | | |
|------------|----------|----|
| Never | 29(11.3) | NA |
| Rarely | 58(22.6) | NA |
| Sometimes | 90(35.0) | NA |
| Frequently | 60(23.3) | NA |
| Very Often | 20(7.8) | NA |

Distance from Perm. Res.

| | | |
|------------------|-----------|----|
| 1 hour or less | 178(67.7) | NA |
| More than 1 hour | 85(32.3) | NA |

Sports

| | | |
|-----|-----------|----|
| Yes | 14(5.4) | NA |
| No | 247(94.6) | NA |

Greek

| | | |
|-----|-----------|----|
| Yes | 27(10.3) | NA |
| No | 236(89.7) | NA |

Drinking in High School

| | | |
|------------------------|-----------|----|
| Low Quant X Frequency | 128(49.6) | NA |
| High Quant X Frequency | 130(50.4) | NA |

SAT Score

| | | |
|-------------------------|---------------------|--|
| N (Mean Score \pm SD) | 255(1228 \pm 117) | 196 (1222 \pm 117) .588 ³ |
|-------------------------|---------------------|--|

¹ All tests of significance are calculated for differences between participants and non participants using the Chi Square statistic unless otherwise noted

² Living and Learning Centers are specialized residential programs initiated by and having direct connections with faculty and specific academic units/departments. Curricular and residential experiences are linked in ways that create opportunities for deeper understanding and integration of classroom material.

³ Means compared using a T test

NA = Not applicable

Table 4.3. Sample Characteristics for Scaled Variables

| | N(%) | Mean (SD) | Cronbach Alpha | Min, Max | Median | Mode | Skewness | Kurtosis |
|---------------------------|------|------------------|-------------------|-----------|---------|---------|----------|----------|
| High School Communication | 264 | 10.52 (3.13) | 0.83 | 3, 15 | 11.00 | 12.00 | -0.45 | -0.48 |
| UMD Alcohol Communication | 251 | 131.55 (22.45) | 0.97 | 30, 150 | 141.00 | 150.00 | -1.94 | 4.24 |
| Attitude toward Drinking | 265 | 11.86 (3.64) | 0.89 | 4, 20 | 12.00 | 12.00 | -0.50 | -0.16 |
| Perceived Risk | 255 | 44.90 (21.46) | 0.87 | 6, 150 | 44.00 | 48.00 | 0.90 | 2.12 |
| Parental Subjective Norm | 261 | 22.52 (15.30) | 0.89 | 6, 102 | 18.00 | 24.00 | 2.12 | 6.44 |
| Alcohol Problems | 241 | 26.38 (8.18) | 0.87 | 20, 74 | 23.00 | 20.00 | 1.97 | 5.48 |
| SAT Total Score | 255 | 1227.96 (117.04) | NA | 850, 1500 | 1240.00 | 1250.00 | -0.53 | 0.52 |

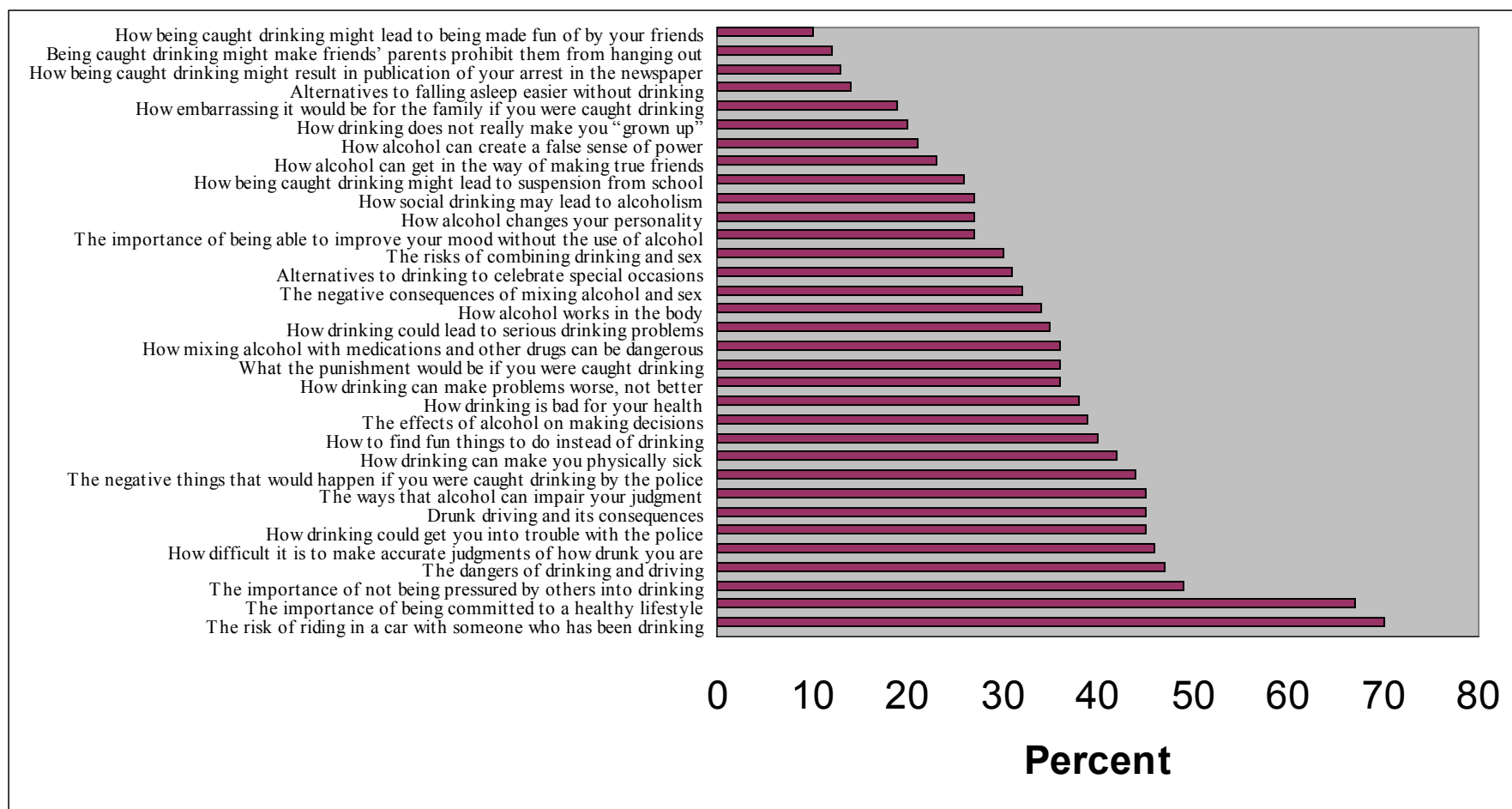


Figure 4.1. Topics of Parent-Child Alcohol Communication

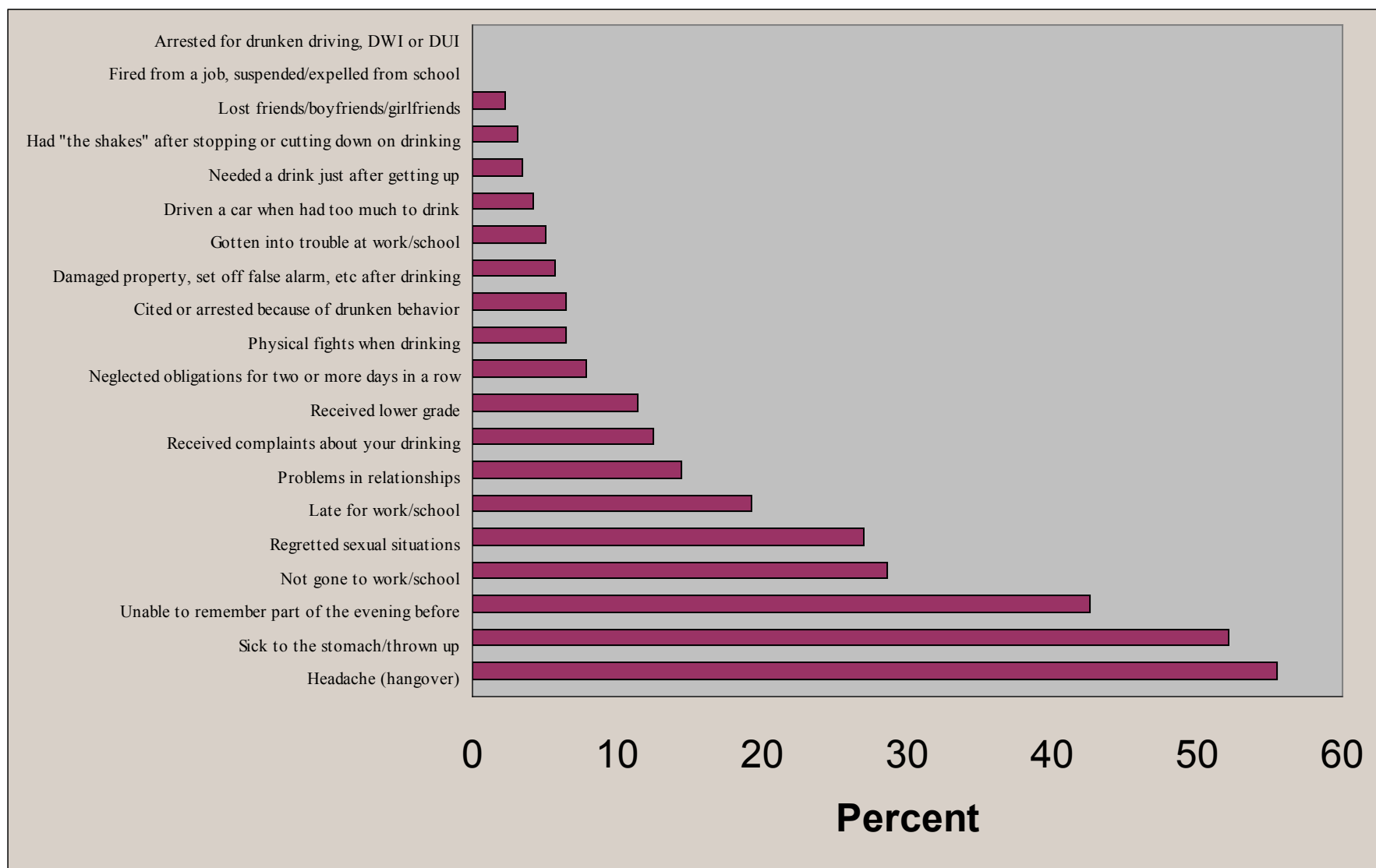


Figure 4.2. Problems experienced from drinking

4.3. Bivariate Correlations

Students reporting they were White ($r=0.19$), that their permanent residence was further from school ($r=0.15$), that they were affiliated with a Greek organization ($r=0.19$) or an intercollegiate sports team ($r=0.15$), that they drank more and more frequently in high school ($r=0.55$), that they had a favorable attitude towards alcohol ($r=0.51$), that they held a riskier parental subjective norm ($r=0.22$), and that their mothers ($r=0.14$) and fathers drank more frequently ($r=0.18$) reported significantly more alcohol problems ($p \leq 0.05$). Students who reported higher levels of communication about alcohol with their parents in both high school ($r=-0.23$) and since they began college ($r=-0.18$) reported significantly ($p \leq 0.05$) more alcohol problems.

Students reporting that they were affiliated with a Greek organization ($r=-0.14$), that they drank more and more frequently in high school ($r=-0.20$), and that they had a favorable attitude toward alcohol ($r=-0.19$) reported significantly greater parental communication about alcohol since they began school at the university. Students who reported greater high school parental communication about alcohol also reported significantly greater parental communication about alcohol since they began college ($r=0.50$, $p \leq 0.05$). Students who reported that they were male ($r=0.13$), White ($r=0.20$), that their permanent residence was greater than 1 hour from the university ($r=0.29$), that they were affiliated with a Greek organization ($r=0.16$), and that they drank more and more frequently in high school ($r=0.57$) reported significantly ($p \leq 0.05$) more favorable attitudes toward alcohol. In addition, students who reported perceiving less risk from drinking ($r=0.19$), a riskier parental subjective norm ($r=0.12$), greater frequency of

parental drinking ($r_{\text{mother}}=-0.21$ $r_{\text{father}}=-0.16$), and greater high school parental communication about alcohol ($r=-0.23$) reported significantly ($p \leq 0.05$) more favorable attitudes toward alcohol.

Eighteen year olds ($r=-0.13$), students affiliated with a Greek organization ($r=0.18$), and students who drank more and more frequently in high school ($r=0.14$) reported perceiving significantly less risk of drinking alcohol than 19 year olds, non-Greeks, and students who drank less in high school. Students who reported being male ($r=0.16$), White ($r=0.15$), that their permanent residence was further from the university ($r=0.14$), that they drank more and more frequently in high school ($r=0.20$), and that their parents drank more frequently ($r_{\text{mother}}=0.32$ $r_{\text{father}}=0.23$) reported a significantly riskier parental subjective norm (Table 4.4.).

Table 4.4. Bivariate Pearson Correlations

| | 19 yrs. | Male | White | >1 hour | Greek | Sports | HS Alc. Comm. | HS Drink | SAT | College Alc Comm. | Attitude | Problem Drinking | Perc. Risk | Parent Subj. Norm | Mom Drink |
|--------------------|---------|-------|--------|---------|--------|--------|------------------|-------------|-------|----------------------|----------|---------------------|---------------|----------------------|--------------|
| 19 yrs. | 1.00 | | | | | | | | | | | | | | |
| Male | 0.10 | 1.00 | | | | | | | | | | | | | |
| White | 0.03 | 0.16* | 1.00 | | | | | | | | | | | | |
| > 1 hour | 0.12 | 0.05 | 0.18* | 1.00 | | | | | | | | | | | |
| Greek | -0.02 | 0.01 | 0.11 | 0.09 | 1.00 | | | | | | | | | | |
| Sports | 0.10 | -0.03 | 0.05 | 0.09 | -0.03 | 1.00 | | | | | | | | | |
| HS Alc. Comm. | -0.04 | 0.05 | -0.16* | -0.12 | -0.14* | -0.04 | 1.00 | | | | | | | | |
| HS Drink | 0.03 | 0.10 | 0.30* | 0.18* | 0.24* | 0.13* | -0.33* | 1.00 | | | | | | | |
| SAT | -0.03 | 0.26* | 0.42* | -0.02 | 0.03 | -0.17* | 0.09 | 0.06 | 1.00 | | | | | | |
| College Alc. Comm. | -0.03 | -0.04 | -0.04 | -0.03 | -0.14* | 0.03 | 0.50* | -0.20* | -0.02 | 1.00 | | | | | |
| Alcohol Attitude | 0.04 | 0.13* | 0.20* | 0.29* | 0.16* | 0.06 | -0.23* | 0.57* | 0.01 | -0.19* | 1.00 | | | | |
| Alcohol Problems | 0.11 | 0.13 | 0.19* | 0.15* | 0.19* | 0.15* | -0.23* | 0.55* | 0.10 | -0.18* | 0.51* | 1.00 | | | |
| Perceived Risk | -0.13* | 0.12 | 0.05 | -0.08 | 0.18* | 0.04 | 0.02 | 0.14* | 0.03 | 0.02 | 0.19* | 0.07 | 1.00 | | |
| Parent Subj. Norm | 0.05 | 0.16* | 0.15* | 0.14* | 0.08 | 0.03 | 0.09 | 0.20* | 0.09 | 0.06 | 0.12* | 0.22* | 0.08 | 1.00 | |
| Mother's Drinking | -0.10 | -0.05 | 0.15* | 0.16* | 0.12* | 0.10 | -0.07 | 0.24* | -0.03 | 0.09 | 0.21* | 0.14* | -0.02 | 0.32* | 1.00 |
| Father's Drinking | -0.03 | -0.05 | 0.16* | -0.03 | 0.00 | 0.12* | -0.13* | 0.27* | -0.02 | 0.02 | 0.16* | 0.18* | -0.02 | 0.23* | 0.43* |

*p ≤ 0.05

4.4. Logistic Regression

Hypothesis 1: Students' perceptions of post-matriculation parent-child communication regarding the negative consequences of alcohol use are protective against problem drinking among college students.

Logistic regression revealed that the only significant predictors of students having experienced an alcohol problem since they began school were age, high school drinking, and high school parent-child alcohol communication. Students who were 19 were almost three times more likely to report having experienced an alcohol problem than students who were 18 (OR=2.98, 95%CI = 1.01, 8.79). Students who reported that they drank greater quantities and/or more frequently in high school were 12 times more likely to have experienced a drinking problem at college than were students who drank less and less frequently in high school (OR=12.48, 95%CI=35.29). Students who reported that their parents talked with them less frequently about alcohol during high school were *less* likely to report having experienced a drinking problem in college (OR=0.78, 95%CI=0.63, 0.93). There was not a significant relationship between parent-child alcohol communication since students began college and problem drinking (Table 4.5.).

Table 4.5. Logistic Regression of Problem Drinking (N=204)

| PREDICTOR | OR | 95% CI |
|-------------------------------------|-------|--------------|
| 19 Yrs. Old | 2.83 | 1.01, 8.79* |
| Male | 0.98 | 0.39, 2.44 |
| White | 0.77 | 0.31, 1.95 |
| Mother Drinks | 0.96 | 0.61, 1.51 |
| Dad Drinks | 1.46 | 0.94, 2.25 |
| Greek Member | 5.57 | 0.52, 59.58 |
| Sports Member | 3.56 | 0.28, 44.81 |
| Perm. Res. Distance (>1 hour) | 2.52 | 0.98, 6.50 |
| HS Communication | 0.77 | 0.63, 0.93* |
| HS Drinking | 12.48 | 4.41, 35.29* |
| SAT Score | 1.00 | 0.99, 1.01 |
| Alc. Communication | 1.02 | 0.99, 1.04 |
| Model $\chi^2 = 91.36$, $p = .000$ | | |
| * $p \leq 0.05$ | | |

4.5. Path and Structural Equation Models

Hypothesis 2: The relationship between students' perceptions of parent-child communication and problem drinking will be mediated by parental subjective norms and attitudes towards drinking (Theory of Reasoned Action Model).

The results for the TRA model were similar for all four of the models tested (path/measured model without covariates, path/measured model with covariates, SEM/latent model without covariates, SEM/latent model with covariates) (Table 4.6.). In all four of the models the paths between Parent-child Alcohol Communication and Attitude were significant ($p \leq 0.05$). Students who reported greater alcohol communication with their parents since they began school reported significantly more favorable attitudes towards alcohol ($p_{\text{measured, no covariates}} = -0.16$, $p_{\text{measured, covariates}} = -0.12$,

$p_{\text{latent, no covariates}} = -0.18$, $p_{\text{latent, covariates}} = -0.13$). Based on the reliability corrected model with covariates, a one unit increase in Parent-child Alcohol Communication would result in a .13 unit decrease in favorable Alcohol Attitudes. In all models, the paths between Attitude and Problem Drinking were significant ($p \leq 0.05$). Students who reported more favorable attitudes towards alcohol reported significantly more alcohol problems ($p_{\text{measured, no covariates}} = 0.36$, $p_{\text{measured, covariates}} = 0.15$, $p_{\text{latent, no covariates}} = 0.42$, $p_{\text{latent, covariates}} = 0.19$). Based on the reliability corrected model with covariates, a one unit increase in Alcohol Attitudes would result in a .19 unit increase in Alcohol Problems. When the covariates were included in either the measured or the latent model, the paths between Communication and Parent Subjective Norm were significant ($p \leq 0.05$). Students who reported greater alcohol communication with their parents reported significantly riskier parent subjective norms ($p_{\text{measured, covariates}} = -0.20$, $p_{\text{latent, covariates}} = -0.22$). Based on the reliability corrected model with covariates, a one unit increase in Parent-Child Alcohol Communication would result in a .22 unit decrease in Parental Subjective Norm. The inclusion of the covariates slightly reduced the magnitude of the paths between Communication and Attitude and between Attitude and Problem Drinking. As expected, the latent models resulted in larger path values for almost all paths.

Hypothesis 3: The relationship between students' perceptions of parent-child communication and problem drinking will be mediated by perceived risk (Health Belief Model).

The results for the HBM model were similar for all four of the models tested (path/measured model without covariates, path/measured model with covariates,

SEM/latent model without covariates, SEM/latent model with covariates) (Table 4.7.). In all models, the paths between all variables were small (≤ 0.06) and none of the path values achieved significance. The latent models revealed only slight improvements in the magnitude of some of the paths.

Hypothesis 4: The relationship between students' perceptions of parent-child communication and problem drinking will be mediated by parental subjective norms, attitudes towards drinking, and perceived risk (Additive model using constructs borrowed from both the Theory of Reasoned Action and the Health Belief Model).

The results for the combined model were similar for all four of the models tested (path/measured model without covariates, path/measured model with covariates, SEM/latent model without covariates, SEM/latent model with covariates) (Table 4.8.) and the results closely mirrored the results of the tests of the TRA and HBM models individually. In all four of the models the paths between Parent-child Alcohol Communication and Attitude were significant ($p \leq 0.05$) with students who reported greater alcohol communication with their parents reporting significantly more favorable attitudes towards alcohol ($p_{\text{measured, no covariates}} = -0.16$, $p_{\text{measured, covariates}} = -0.12$, $p_{\text{latent, no covariates}} = -0.18$, $p_{\text{latent, covariates}} = -0.13$). Based on the reliability corrected model with covariates, a one unit increase in Parent-Child Alcohol Communication would result in a .13 unit decrease in Alcohol Attitudes. In all models the paths between Attitude and Problem Drinking were significant ($p \leq 0.05$) with students who reported more favorable attitudes towards alcohol reporting significantly more alcohol problems ($p_{\text{measured, no covariates}} = 0.37$, $p_{\text{measured, covariates}} = 0.16$, $p_{\text{latent, no covariates}} = 0.42$, $p_{\text{latent, covariates}} = 0.19$). Based

on the reliability corrected model, a one unit increase in Alcohol Attitudes would result in a .19 unit increase in Alcohol Problems. When the covariates were included in either the measured or the latent model, the paths between Communication and Parent Subjective Norm were significant ($p \leq 0.05$) with students who reported greater alcohol communication with their parents reporting significantly riskier parent subjective norms ($p_{\text{measured, covariates}} = -0.20$, $p_{\text{latent, covariates}} = -0.22$). Based on the reliability corrected model with covariates, a one unit increase in Parent-Child Communication would result in a .22 unit decrease in Parent Subjective Norm. Finally, there was a significant ($p \leq 0.05$) correlation between Alcohol Attitudes and Perceived Risk ($p_{\text{measured, no covariates}} = 0.19$, $p_{\text{measured, covariates}} = 0.17$, $p_{\text{latent, no covariates}} = 0.22$, $p_{\text{latent, covariates}} = 0.20$). Based on the reliability corrected model with covariates, a one unit increase in Alcohol Attitudes would correspond to a .20 unit increase in Perceived Risk.

The inclusion of the covariates slightly reduced the magnitude of the paths between Communication and Attitude, between Attitude and Problem Drinking, and between Attitude and Perceived Risk. Similar to the HBM model results, none of the mediating paths that included perceived risk were significant and their magnitudes were small ($p \leq 0.06$). As expected, the latent models resulted in larger path values for almost all paths.

Table 4.6. Path coefficients for the models hypothesizing mediation between communication and problems using constructs borrowed from the TRA (Hypothesis 2)

| | | <u>No Covariates</u> | | | | <u>Covariates</u> | | | |
|---------------------------------|-----------------------|----------------------|----------|------------|---------------|----------------------|----------|------------|---------------|
| | | Communication | Attitude | Subj. Norm | Problem Drink | Communication | Attitude | Subj. Norm | Problem Drink |
| Measured Model (Uncorrected) | Communication | NA | -0.16* | -0.15 | 0.02 | NA | -0.12* | -0.20* | 0.02 |
| | Attitude ¹ | | NA | 0.12 | 0.36* | | NA | 0.02 | 0.15* |
| | Subj. Norm | | | NA | 0.00 | | | NA | -0.05 |
| | R ² =0.13 | | | | | R ² =0.26 | | | |
| Latent Model (Corrected) | Communication | NA | -0.18* | -0.16 | 0.03 | NA | -0.13* | -0.22* | 0.02 |
| | Attitude ¹ | | NA | 0.13 | 0.42* | | NA | 0.02 | 0.19* |
| | Subj. Norm | | | NA | 0.00 | | | NA | -0.06 |
| | R ² =0.17 | | | | | R ² =0.30 | | | |

Note: Path coefficients are determined from the standardized solutions. These entries represent path coefficients from variables on the left to variables on the top.

¹Path coefficient between Attitude and Subjective Norm is the covariance

*p ≤ 0.05

Table 4.7. Path coefficients for the models hypothesizing mediation between communication and problems using constructs borrowed from the HBM (Hypothesis 3)

| | | <u>No Covariates</u> | | | <u>Covariates</u> | | |
|------------------------------------|----------------|----------------------|----------------|---------------|-------------------|----------------------|---------------|
| | | Communication | Perceived Risk | Problem Drink | Communication | Perceived Risk | Problem Drink |
| Measured Model (Uncorrected) | Communication | NA | 0.04 | -0.04 | NA | 0.05 | 0.01 |
| | Perceived Risk | | NA | 0.05 | | NA | -0.01 |
| | | | | | | | |
| | | | | | | R ² =0.24 | |
| Latent Model (Corrected) | Communication | NA | 0.04 | -0.04 | NA | 0.06 | 0.01 |
| | Perceived Risk | | NA | 0.06 | | NA | -0.01 |
| | | | | | | | |
| | | | | | | R ² =0.28 | |

Note: Path coefficients are determined from the standardized solutions. These entries represent path coefficients from variables on the left to variables on the top.

Table 4.8. Path coefficients for the models hypothesizing mediation between communication and problems using constructs borrowed from the TRA and HBM (Hypothesis 4)

| | | <u>No Covariates</u> | | | | | <u>Covariates</u> | | | | |
|---------------------------------|----------------------|----------------------|----------|------------|------------|---------------|-------------------|----------|------------|------------|----------------------|
| | | Communication | Attitude | Subj. Norm | Perc. Risk | Problem Drink | Communication | Attitude | Subj. Norm | Perc. Risk | Problem Drink |
| Measured Model (Uncorrected) | Communication | NA | -0.16* | -0.15 | 0.04 | 0.03 | NA | -0.12* | -0.20* | 0.05 | 0.02 |
| | Attitude | | NA | 0.12 | 0.19* | 0.37* | | NA | 0.02 | 0.17* | 0.16* |
| | Subj. Norm | | | NA | 0.07 | 0.00 | | | NA | 0.03 | -0.05 |
| | Perceived Risk | | | | NA | -0.02 | | | | NA | -0.03 |
| | R ² =0.13 | | | | | | | | | | R ² =0.26 |
| Latent Model (Corrected) | Communication | NA | -0.18* | -0.16 | 0.04 | 0.04 | NA | -0.13* | -0.22* | 0.06 | 0.02 |
| | Attitude | | NA | 0.13 | 0.22* | 0.42* | | NA | 0.02 | 0.20* | 0.19* |
| | Subj. Norm | | | NA | 0.08 | 0.00 | | | NA | 0.03 | -0.06 |
| | Perceived Risk | | | | NA | -0.03 | | | | NA | -0.04 |
| | R ² =0.17 | | | | | | | | | | R ² =0.30 |

Note: Path coefficients are determined from the standardized solutions. These entries represent path coefficients from variables on the left to variables on the top.

* $p \leq 0.05$

¹Path coefficients between Attitude and Subjective Norm, Attitude and Perceived Risk, and Subjective Norm and Perceived Risk are the covariances

Covariates

The significant covariates and their path values remained nearly the same for all models. In all models (path/measured model without covariates, path/measured model with covariates, SEM/latent model without covariates, SEM/latent model with covariates) 19 year olds ($p = 0.10$), students whose fathers drank more frequently ($p = 0.18$), students involved in intercollegiate sports ($p = 0.08$), and students whose parents communicated with them more in high school ($p = 0.25$) reported significantly ($p \leq 0.05$) more parent-child alcohol communication since beginning college than students not reporting these factors. Nineteen year olds reported significantly less favorable attitudes towards alcohol than 18 year olds ($p = -0.06$, $p \leq 0.05$). Students whose permanent residences were further from the university ($p = 0.21$) and students who reported drinking more and more frequently in high school ($p = 0.40$) reported significantly ($p \leq 0.05$) more favorable attitudes towards alcohol than students whose permanent residences were closer or who drank less in high school. Nineteen year olds ($p = 0.08$), male students ($p = 0.15$), and students whose mothers drank more frequently ($p = 0.32$) reported significantly ($p \leq 0.05$) riskier parental subjective norms than students not reporting these characteristics. Students who reported that their permanent residences were further from the university reported significantly ($p \leq 0.05$) less perceived risk ($p = 0.06$) than students whose permanent residences were closer to the school. Finally, in the TRA models and the combined TRA/HBM models, nineteen year old students ($p = 0.06$) and students who reported that they drank more and more frequently in high school ($p = 0.32$) reported significantly ($p \leq 0.05$) more alcohol problems than 18 year olds and students who drank less in high school. In the HBM models, only students reporting that they drank more

and more frequently in high school ($p = 0.41$) reported significantly ($p \leq 0.05$) more alcohol problems than students who drank less in high school.

Hypothesis 5: The relationship between students' perceptions of parent-child communication and problem drinking will be best explained by the additive path model utilizing constructs borrowed from both the Theory of Reasoned Action and the Health Belief Model.

Only the TRA model (Hypothesis 2) has significant paths. The paths in the HBM model are of extremely small magnitude and did not approach significance. These same results are mirrored in the combined TRA/HBM model with almost the exact path values. In the latent models (both with and without covariates), the values for the direct path between communication and problem drinking are exactly the same. Therefore, a test to determine which direct path is statistically larger would not make sense and will not be conducted.

V) DISCUSSION

5.1. Lessons Learned from Development and Implementation

In focus groups, students reported that they wanted to have a good relationship with their parents in which they talked about their lives in general but if parents became too “nosy” about social activities such as drinking it would tend to push students away and end communication. While students do not wish to talk specifically about their drinking behaviors or ways to reduce the risk from drinking, they felt that parents’ warnings to “be careful” would be helpful in reducing problem drinking behavior. However, parents should be more specific and share the possible consequences of drinking with their students. While students do not want parents to “tell them what to do” they would like to know their parents are there for them should they experience a serious consequence from drinking.

The observed pre-test with interview, pilot test, and alpha test were significant in making important and necessary changes to the web survey. In particular, the observed pre-test helped identify some major modifications to the web survey to ensure proper implementation.

Expert review assisted greatly with survey formatting and identified a flaw in the face validity of the original perceived risk scale. Significant modifications were made to improve these issues. It is also important to note the change to follow up procedures. College students do not respond well to persistent and closely spaced follow up calls. The investigator found, in this study, the closest that follow up calls and emails should be spaced are one week apart.

5.2. Analysis

Descriptive analysis revealed that students are experiencing some serious consequences from drinking such as hangovers, getting sick to the stomach, and getting into regretted sexual situations. These findings mirrored findings discovered by Park (2004) who found that among a sample of 263, mainly White college students 96% reported at least one negative consequence of alcohol use. The most common negative consequences of alcohol use were being sick or getting a hangover ($n = 82$, 36%), engaging in regretted sexual activity ($n = 38$, 17%), consequences due to another person's drinking ($n = 33$, 15%), aberrant behavior ($n = 34$, 15%), fighting or arguing ($n = 22$, 10%), and having school problems ($n = 18$, 8%) (Park, 2004).

While students are experiencing alcohol problems, they perceive relatively little parent-child alcohol communication after they begin school and topics of communication were limited. While the scales have not been normed, qualitatively the mean scores for Alcohol Attitudes and Perceived Risk were higher than the scale midpoints indicating that students, on average, tend to have risky attitudes towards alcohol (favorable attitudes) and perceive that drinking does not pose a great risk to them. Likewise, the mean score for parental subjective norm was greater than the scale midpoint indicating that, on average, students tend to have a low risk parental subjective norm. That is, on average, students report that their parents do not approve of them drinking and that their parents' opinions are important to them.

Only two predictors showed a significant relationship with problem drinking in logistic regression. Students who were older, students who drank greater quantities

and/or in greater frequencies in high school, and students whose parents talked with them about alcohol in high school were more likely to have experienced a negative consequence from alcohol since they started school at UMD. Students who are older may more easily obtain fake identification, allowing them to drink more or more often and thus, they may have a greater likelihood of experiencing an adverse consequence when drinking. The finding that students who drank greater quantities or in greater frequencies in high school were more than 12 times as likely to experience a negative consequence from drinking in college was not surprising as the relationship between high school drinking and college drinking behavior has been supported in previous research (Wechsler et al., 1995a).

It is surprising that students whose parents talked with them more about alcohol while they were in high school were more likely to have experienced a negative consequence from drinking than students whose parents communicated with them about alcohol less in high school. This parental communication may have been a reaction to parents' perceptions that their children were at risk for alcohol problems. This finding is similar to the findings from the path and structural equation modeling analyses in which college parent-child communication is inversely related to alcohol attitudes and parental subjective norm. Possible reasons for these surprising findings are elaborated below. In logistic regression analysis alcohol communication was not related to problem drinking. Even though the outcome variables differ (dichotomized measure of problem drinking vs. continuous measure of problem drinking) these results are similar to the results of path analysis and structural equation modeling in which there was no direct relationship between communication and problem drinking. While alcohol communication and

problem drinking were significantly related in bivariate analyses, the addition of covariates appears to reduce their relationship. However, as discussed below, results from path analysis and structural equation modeling indicate that there is an indirect relationship between alcohol communication and problem drinking even after covariates are controlled.

Path analysis and structural equation modeling resulted in some unexpected findings. The TRA model and the combined TRA/HBM model revealed that parent-child alcohol communication was related to problem drinking through attitude. As expected, students who reported more favorable attitudes towards alcohol, reported more alcohol problems. This finding is supported by a longitudinal study by Simons and Gaher (2004) who found that a favorable alcohol attitude at Time 1 was associated with greater alcohol consumption and experiencing more alcohol problems at Time 2 (Simons & Gaher, 2004).

In both the TRA and TRA/HBM models, communication was related to attitude in the direction opposite of what was expected. Students who reported greater perceived communication reported more favorable attitudes towards alcohol. Four possible explanations for this finding have been identified. First, it is possible that students who perceived that their parents talked with them more about alcohol rebelled by developing more favorable attitudes toward alcohol which drove those students to experience more alcohol related problems. Second, it is possible that parents' communicated more with their children if they perceived that their children were holding positive attitudes towards alcohol or that their children were having alcohol problems. Because this is a cross sectional survey, it is not possible to identify which occurred first. Third, this was a

study regarding students' perceptions of parental communication. It is possible that students who have had alcohol problems were more likely to perceive greater alcohol communication from their parents than students who have not experienced many alcohol problems. Students who have experienced problems may be more sensitive or in-tune with messages regarding alcohol and therefore they may be more likely to report such communication. Finally, it may be that the communication that the investigator assumed connoted the negative effects of alcohol was actually communicated in a way, or perceived by students in a way, that glorified alcohol use. For example, parents who spoke to their children about how alcohol can impair one's judgment may have been telling a story about their own college alcohol experiences and conveying (or were perceived to be conveying) that the experience was funny or that it bonded them with friends or was somehow otherwise enjoyable to them. In this way, it is possible that the communication was actually encouraging a favorable attitude towards alcohol. The latter hypothesis is supported by the fact that, in the TRA models and combined TRA/HBM models that included covariates, students who reported greater communication reported significantly riskier parental subjective norms indicating that they felt that their parents approved of them drinking and that their parents' opinions were not important to them. It is possible that parental communication about risks that emphasized the benefits of alcohol use could send the message to students that parents approved of their drinking.

There was no relationship between parental subjective norm and problem drinking in any of the models. While, in general, students reported believing their parents did not approve of their drinking and that their parents' opinions were important to them and while students in the focus groups reported that they wished to avoid problems with

alcohol so as not to displease or disappoint their parents, this finding did not extend to model testing. It is possible that while students can rationalize that experiencing problems from drinking may interfere with their relationships with their parents, the desire to please their parents does not affect their actual behavior.

The models based on the constructs borrowed from the HBM yielded no significant relationships or relationships of importance, as the magnitudes of the paths were miniscule. Thus, it appears that perceived risk is not an important variable in explaining drinking problems and does not mediate the relationship between parent-child communication and drinking problems. Relevant research conducted by Park (2004) indicates that, while college student drinking does result in many negative consequences, it also results in many positive consequences such as forgetting one's worries, feeling more sexy, and having better ideas (Park, 2004). Park reports that students report their experiences with positive consequences as being more extreme and more frequent than their experiences with negative consequences (Park, 2004). Furthermore, greater alcohol consumption was related to students experiencing more extremely positive, positive encounters, but not more extremely negative, negative encounters (Park, 2004). Thus, while students may perceive drinking to be risky, they may be more motivated to drink by their positive drinking experiences, thereby experiencing more drinking problems.

Because the model utilizing construct borrowed from the HBM did not result in any significant relationships or relationships of importance, and because the TRA based model resulted in nearly identical findings to the combined TRA/HBM model the final planned analysis to identify the model which best explains the relationship between communication and problem drinking was unnecessary and therefore omitted. However,

while it is not logical to statistically compare nearly identical models, it is possible to qualitatively evaluate them. While the TRA model and the combined TRA/HBM model are nearly identical, the TRA model, being the most parsimonious, is proposed as the model best explanation of the relationship between communication and problem drinking.

This study tested models that were built using only constructs from the HBM and TRA, rather than using the models in their entirety. Furthermore, the study is unusual in that it tested a model that combined constructs from both of these theories. While it is impossible to know if problem drinking would have been better explained had the theories been utilized in their entirety, it is a legitimate argument that health behavior theories should not be modified, including the dissection of theories into only their parts and combining constructs from different theories. It is possible that using only certain constructs from each theory compromised the ability to explain the outcome and, thus, this investigation is not a true test of the utility of each theory in explaining problem drinking. Yet, the investigation has added to the body of knowledge regarding the individual theoretical constructs and has provided an example for future investigations aiming to build more powerful “super-theories” by combining constructs from two or more theories.

5.3. Limitations

There are several limitations to this study. First, because the instrument used for the investigation was newly developed instrument, the reliability and validity of the instrument were not well established. However, the developmental activities (focus

groups, in-depth interviews, and pilot testing) served to increase confidence in the reliability and validity of the instrument. Established measures were used whenever possible, adding to confidence in the measures. In addition, as much as possible, multi-item scales were used to measure constructs also increasing confidence in the reliability of measures.

Second, while personally identifying information was not collected via the web questionnaire, the necessity to sample from the Registrar's list and to send students invitation letters meant that the survey was not anonymous. This lack of anonymity may have induced a social desirability effect. For example, students may have under-reported the extent of their alcohol consumption in an effort to conform to perceived attitudes of their perceived audience. In order to minimize social desirability effects, confidentiality was emphasized in the invitation letter, the questionnaire itself, the reminder contacts, and in the electronic consent form. In addition, because the survey was web-based, this may have given students a sense of anonymity, further reducing socially desirable responses. According to Dillman (2000), social desirability effects can be minimized by creating an environment where individuals fear no penalty for honest responses (Dillman, 2000).

Third, because this was a cross-sectional survey study, causal interpretations of findings are not warranted. A longitudinal study in which temporal priority can be established or an experimental design in which only the independent variable of interest is varied lend more support to causal interpretations than does a cross sectional survey. Nevertheless, cross sectional data such as these can give insight into possible causal processes and can give support for future, more complex research endeavors. In addition,

the cross sectional nature of the study means that it is not possible to identify the temporal ordering of parent-child communication, the development of attitude and parental subjective norm, and the occurrence of problem drinking. As discussed above, this may explain the unexpected finding in which students who reported greater parent-child communication also reported significantly more favorable attitudes towards alcohol.

Fourth, there are several limits on the extent to which these findings can be generalized to all college students. The response rate for the survey was relatively low and an analysis of participants and non-participants revealed that significantly more women and students participating in living learning centers participated in the survey. Thus, these findings cannot be generalized to men or students who do not live in living learning centers. Also, because of the small response rate, it is possible that there were other differences between participants and non-participants which were not detected. Furthermore, the sample from this study was recruited from only one college campus. If the study were conducted at a school of a different size, location, sports orientation, etc. findings may be quite different. There may also be unidentified historical effects impacting results. Only one cohort of students was studied and therefore current events may have affected findings. If time and money had allowed a second cohort of students to be surveyed at a different point in time, there may have been differences in results. Likewise, there may have been cyclical effects as students were surveyed after Spring Break during their second semester. If students had been surveyed in the Fall or before spring break or closer to exam time, findings may have differed. For example, students self concepts or family orientations may vary throughout the year. If students had been surveyed closer to exam time rather than after Spring Break they may have conceived of

themselves more as the “serious student” whereas immediately following break they may have conceived of themselves as a “partying college student.” This could affect reports of measures such as attitudes towards alcohol. Conversely, immediately following a “family” type holiday such as those that occur over winter break (e.g. Christmas and Chanukah) students may consider themselves closer with their parents. This could affect reports of measures such as parental subjective norm.

Another limitation of the study that was discussed in relation to the unexpected direction of the relationship between communication and problem drinking is that the connotation of the alcohol communications that took place between parents and students was not assessed. It was assumed that if parents discussed the alcohol topics included in the communication measure that they would necessarily be conveying the negative effects of alcohol. However, if parents talked about the drinking consequences in a positive manner (e.g. indicated the consequence was funny, the consequence bonded them with friends, etc) it is possible the communication could have the opposite effect of what was expected (i.e. foster positive alcohol attitudes and risky parental subjective norms).

Finally, this study assessed students’ perceptions of parental communication. It is possible that parents would have reported different communication behaviors than the perceptions that were reported by students. The extent to which parents’ actually approve of student drinking is unknown. Research among adolescents has shown that there often is considerable discordance between adolescent perceptions of parental behavior and parental behavior as reported by parents themselves (Beck, Shattuck, Raleigh, 2001).

However, it appears that it is the adolescent perception of parental behavior that has been found to be protective against risk behavior (Cotrell et al., 2003).

5.4. Implications

It is difficult to discuss the implications of this research when the meaning of the findings of the relationship between communication and problem drinking are so unclear. If communication is truly detrimental to students, fostering favorable attitudes towards drinking, the implication would be that parents should be dissuaded from discussing alcohol with their children. However, if communication is reactive to unhealthy attitudes and/or drinking problems, then possibly parents should receive training on how to talk to students who are exhibiting these signs of risk. If parents are talking about the negative consequences of alcohol in a positive light and thus driving the development of favorable alcohol attitudes and more drinking problems, then it may be beneficial to educate them about the possible negative effects this communication is having on their children and train them to talk about alcohol in a beneficial manner. In addition, this is only one study, of one sample of college students. There are many limitations to generalization (discussed above). Therefore, more information is needed before recommendations can be made for intervention. However, in a study of 556 late adolescents in the summer before they began college, Wood, Read, Mitchell, and Brand (2004) found that adolescents whose parents disapproved of alcohol use, were less permissive of alcohol use, and monitored their children's whereabouts more, reported less engagement in heavy episodic drinking (Wood, Read, Mitchell, Brand, 2004). While this study did not investigate parental communication, it is of interest to note that the findings suggest that

parents continue to exert an influence over late adolescents' drinking behaviors. This lends support to the notion that parents could be a source of prevention for drinking problems even after students have begun college.

5.5. Future Research

Future research should test these hypotheses in different samples of students to assess the extent to which the findings here can be generalized to other populations, including samples more representative of men and students residing in various living situations. Parent-child alcohol related communication also should be examined in detail as there are many questions left unanswered. First, in this sample rates of communication, as measured by the Parent-child Alcohol Communication Scale, were relatively low. Students perceived that parents communicated very little about alcohol and when communication did take place, the scope of topics covered were rather limited. Thus, it would be of interest to determine why rates of communication are low and if there are other topics regarding alcohol use, besides those measured in this study, that are discussed. Furthermore, the way alcohol messages are communicated should be assessed, as the connotations of the alcohol communication may be important in the impact that communication has on students. In addition, there may be forms of communication, rather than just the verbal communication assessed here, that may impact students attitudes toward alcohol, parental subjective norm, and drinking problems. Finally, longitudinal studies should be conducted to describe the development and effects of communication over time. Such studies could shed light on the unexpected inverse

relationship between communication, attitudes, and parental subjective norm found in this study.

5.6. Conclusions

The relationship between parent-child communication about alcohol and college student drinking is mediated by students' attitudes towards alcohol, a construct borrowed from the Theory of Reasoned Action. However, as communication between parents and students increase, attitudes towards alcohol become more favorable which in turn drives an increase in problem drinking. Several reasons for this unexpected relationship between communication and attitude are hypothesized. More research is needed to explain the findings of this study and to test hypotheses in more diverse and representative samples. More information is needed before recommendations for interventions can be made.

APPENDIX A

Informed Consent: **Focus Group**

Identification of Project: College Alcohol and Parental Influence.

Statement of age of subject: I state that I am at least 18 years of age, in good physical health, and wish to participate in a program of research being conducted by Bradley O. Boekeloo, PhD, MS in the department of Public and Community Health at the University of Maryland, College Park, MD 20742.

Purpose: The purpose of this research is to assess college students' thoughts about drinking and parental influences on drinking.

Procedures: I will be participating a focus group discussion . I will participate in a discussion group with other students. We will discuss drinking among college students and the influence parents and others have on that behavior. The discussion will be tape recorded to help the researchers analyze what was said by participants in the group. This activity will last for a total of 1 to 1 ½ hours.

Confidentiality: The focus group discussions are tape recorded and observed to aid in writing reports. My name will not be used in reports. Only the researchers will have access to the tapes. The tapes, notes and other data will be destroyed when they are no longer needed for research. The data provided will be grouped with data others provide for the purpose of reporting and presentation.

Risks: I understand the risks of my participation are anticipated to be minimal. I may feel uncomfortable answering questions about college student drinking. I may refuse to answer any question and may withdraw from the study at any time, without penalty.

Benefits: I understand that this study is not designed to help me personally but that the investigators hope to learn more about preventing adverse consequences of drinking among college students. I understand that I will receive a \$5 bookstore gift card at the end of my participation. This gift is to let me know that my help in this study is important and appreciated.

Where medical care is available: In the event that I suffer psychological stress from my participation in this study, I understand that the University Health Center has support programs regarding these issues if I desire further information. However, I understand that the University of Maryland does not provide any medical or hospitalization insurance coverage for participants in the research study nor will the University of Maryland provide any compensation for any physical or emotional injury or discomfort sustained as a result of participation in this research except as required by law.

Bradley O. Boekeloo, PhD
Associate Professor
Public & Community Health
University of Maryland
College Park, MD 20742
301.405.8546

Printed Name of Subject _____

Signature of Subject _____

Date _____

If you have questions about your rights as a research subject or wish to report a research-related injury, please contact: **Institutional Review Board Office, University of Maryland, College Park, Maryland 20742; (email) irb@deans.umd.edu; (telephone) 301-405-4212**

Informed Consent:
Observed Pretest/In-Depth Interviews

Identification of Project: College Alcohol and Parental Influence.

Statement of age of subject: I state that I am at least 18 years of age, in good physical health, and wish to participate in a program of research being conducted by Bradley O. Boekeloo, PhD, MS in the department of Public and Community Health at the University of Maryland, College Park, MD 20742.

Purpose: The purpose of this research is to assess college students' thoughts about drinking and the utility of a survey designed to measure freshmen's drinking behavior and parental influences.

Procedures: I will be participating in an observed pretest and in-depth interview. I will complete a web-based survey about college alcohol use in the presence of researchers who will observe the ease with which I am able to complete the web-based survey and ask me about my understanding of the survey questions. I will print out a hard copy of my answers so that researchers can compare it with the answers transferred to the database from the on-line survey. Then, I will participate in a one-on-one interview with a research assistant and be asked questions regarding the ease with which I completed the web-based survey, and my understanding of the survey questions. The study will last for a total of 1 to 1 ½ hours.

Confidentiality: My answers to questions on the survey will be anonymous. My name will not appear on the surveys. . If researchers happen to observe my answers when they are trying to learn whether the web survey is easy to complete, they will not take notes about my answers or use my answers in any way. Furthermore, if I feel that they may see an answer that I do not want them to see, I do not have to answer that question or any question. The researchers may take notes about my ability to navigate the survey and about my responses during the interview. My name will not be used in reports. All data will be destroyed when they are no longer needed for research. The data provided will be grouped with data others provide for the purpose of reporting and presentation.

Risks: I understand the risks of my participation are anticipated to be minimal. I may feel uncomfortable answering questions about college student drinking. I may refuse to answer any question and may withdraw from the study at any time, without penalty.

Benefits: I understand that this study is not designed to help me personally but that the investigators hope to learn more about preventing adverse consequences of drinking among college students. I understand that I will receive a \$5 bookstore gift card at the end of my participation. This gift is to let me know that my help in this study is important and appreciated.

Where medical care is available: In the event that I suffer psychological stress from my participation in this study, I understand that the University Health Center has support programs regarding these issues if I desire further information. However, I understand that the University of Maryland does not provide any medical or hospitalization insurance coverage for participants in the research study nor will the University of Maryland provide any compensation for any physical or emotional injury or discomfort sustained as a result of participation in this research except as required by law.

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Date _____

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Informed Consent: Pilot Test

Identification of Project: College Alcohol and Parental Influence.

Statement of age of subject: I state that I am at least 18 years of age, in good physical health, and wish to participate in a program of research being conducted by Bradley O. Boekeloo, PhD, MS in the department of Public and Community Health at the University of Maryland, College Park, MD 20742.

Purpose: The purpose of this research is to assess the utility of a web-based survey designed to measure freshmen's drinking behavior and parental and other social influences on drinking.

Procedures: The procedures involve completing a web-based survey from a computer of my choice. I will receive an email with an internet link and password for the web survey. The survey will ask me about my drinking behaviors and about parental and other social influences on drinking. I will print out a hard copy of my answers and return it to the study office through campus mail so that researchers can compare the answers on the hard copy with the answers transferred to the database from the on-line survey. After I complete the survey, a researcher will call me and ask me if I had any problems navigating or submitting the survey.

Confidentiality: All information collected in the study is confidential. Neither my name nor any personal identifying information (including ss#, student ID, address, telephone number) will be collected with my survey responses in this pilot study. I understand that no attempt will be made to match my name with my survey responses. The data I provide will be grouped with data others provide for the purpose of reporting and presentation.

Risks: I understand the risks of my participation are anticipated to be minimal. I may feel uncomfortable answering questions about drinking. I may refuse to answer any question and may withdraw from the study at any time, without penalty.

Benefits: I understand that this study is not designed to help me personally but that the investigators hope to learn more about preventing adverse consequences of drinking behaviors among college students. I understand that I will receive a \$5 bookstore gift card for completing and submitting the survey. This gift is to let me know that my help in this study is important and appreciated.

Where medical care is available: In the event that I suffer psychological stress from my participation in this study, I understand that the University Health Center has support programs regarding these issues if I desire further information. However, I understand that the University of Maryland does not provide any medical or hospitalization insurance coverage for participants in the research study nor will the University of Maryland provide any compensation for any emotional or physical injury or discomfort sustained as a result of participation in this research except as required by law.

Bradley O. Boekeloo, PhD
Associate Professor
Public & Community Health
University of Maryland
College Park, MD 20742
301.405.8546

Printed Name of Subject_____

Signature of Subject_____

Date_____

If you have questions about your rights as a research subject or wish to report a research-related injury, please contact: **Institutional Review Board Office, University of Maryland, College Park, Maryland 20742; (email) irb@deans.umd.edu; (telephone) 301-405-4212**

Informed Consent:
Implementation

This informed consent appeared in the participant's web-browser when the survey hyperlink was clicked. Participants read and electronically agreed to this form before the survey opened in their web-browser

Identification of Project: College Alcohol and Parental Influence.

Statement of age of subject: I state that I am at least 18 years of age, in good physical health, and wish to participate in a program of research being conducted by Bradley O. Boekeloo, PhD, MS in the department of Public and Community Health at the University of Maryland, College Park, MD 20742.

Purpose: The purpose of this research is to investigate freshmen's drinking behavior and exposure to parental and other social influences.

Procedures: I understand that I have been randomly chosen from a roster of University of Maryland first-year students to complete this survey. This survey is a web-based survey. The survey I am about to take will ask me about my drinking behaviors and about my perceptions of, and experiences with various social influences.

Confidentiality: All information collected in the study is confidential. I understand that no attempt will be made to match my name with my survey responses. The data I provide will be grouped with data others provide for the purpose of reporting and presentation.

Risks: I understand the risks of my participation are anticipated to be minimal. I may feel uncomfortable answering questions about my drinking behavior. I may refuse to answer any question and may withdraw from the study at any time, without penalty.

Benefits: I understand that this study is not designed to help me personally but that the investigators hope to learn more about preventing adverse consequences of drinking among college students. I understand that I will be entered into a drawing to win a \$100 giftcard to Barnes and Noble bookstores for completing and submitting the survey on time. Entry into the drawing is to let me know that my help in this study is important and appreciated.

Where medical care is available: In the event that I suffer psychological stress from my participation in this study I understand that the University Health Center has support programs regarding these issues if I desire further information. However, I understand that the University of Maryland does not provide any medical or hospitalization insurance coverage for participants in the research study nor will the University of Maryland provide any compensation for any injury sustained as a result of participation in this research except as required by law.

Bradley O. Boekeloo, PhD
Associate Professor
Public & Community Health
University of Maryland
College Park, MD 20742
301.405.8546

Printed Name of Subject _____

Signature of Subject _____

Date _____

If you have questions about your rights as a research subject or wish to report a research-related injury, please contact: **Institutional Review Board Office, University of Maryland, College Park, Maryland 20742; (email) irb@deans.umd.edu; (telephone) 301-405-4212**

APPENDIX B

<Date>

Dear <Name>,

Greetings! As a new student to the University, you may not be aware that you are attending one of the premier research institutions in the United States and that the University of Maryland is rated as a select Level I research institution. If you are at least 18 years of age, this may be your first opportunity to join a survey research study. You may learn about the way research studies are performed and help increase scientific understanding of health behaviors through your participation.

The Laboratory for Health Behavior Assessment and Intervention within the Department of Public and Community Health is conducting a survey of first year students in coordination with the University of Maryland Parents Association. The purpose of the survey is to better understand how families influence college students' drinking behaviors.

We invite you to participate in this survey, which will take about 15 minutes to complete. As a sign of our gratitude, we have included a small gift with this letter. In addition, when you submit a completed survey, we will enter you into a drawing for a \$100 gift coupon for Barnes and Noble bookstores.

If you are 18 or 19 years of age and decide to participate in the study, please check your student email account for an email that will be sent to you within 2 days. The email will contain a link to the survey and an identification number that you will need to complete the survey. Please complete the web-based survey within the next week. If you do not complete the survey within that time we will contact you again to ask you to do so. Attached to this letter is a copy of the informed consent form that you will see when you access the survey on-line. You will be asked to agree to the on-line informed consent before you access the survey. This form includes all the important information you should know about the survey. Please read it carefully and note that all data that you provide on the survey is completely confidential. In addition, the data you provide will not be linked to you personally.

Please call us at 301-405-2551 if you have any questions about the study now or in the future or if you do not wish to participate. We look forward to working with you!

Sincerely,

Bradley Boekeloo, PhD
Principal Investigator

APPENDIX C

Focus Group Guide for Questionnaire

Part 1: 30 minutes

- I) Introduction
 - a. Interviewer introduces him/herself
 - b. Participants introduce themselves
- II) Consent
 - a. Explain purpose of project
 - b. Pass out consent forms
 - c. Participants sign consent forms
 - d. Provide participants blank consent forms for their record
- III) General topic questions
 - a. How do parents influence freshmen students' drinking?
 - b. Do you think students whose parents talk more, or talk more often, with them will be less likely to have problems with drinking? Why or why not?
 - c. What specifically could parents talk about with their children to reduce the amount that students drink or reduce the likelihood that students' will have drinking related problems?
 - i. To what extent does parent-student communication about the possible negative effects of drinking influence students' drinking habits?
 - ii. Is there another type of parent-child communication that would be more effective in getting students to drink less? (Give examples below if needed)
 - 1. Skills: talk about how to avoid risky situations when drinking, how to drink less when with friends, etc.
 - 2. Monitoring: asking question about how students spend their free time, ask them how much and how often they drink, ask if their friends drink, set limits on students' drinking

Part 2: 30 minutes

- IV) Survey administration
 - a. Pass out paper based survey to participants
 - b. Read survey script as indicated
 - c. Read each question and its response options then stop to probe for the following feedback:
 - i. What is unclear about this question? How could it be interpreted in different ways?
 - ii. What is a better way to ask this question?
 - iii. What makes this question difficult to answer?
 - iv. Probe any spontaneous non-verbal expressions (giggles, frowns, etc.) observed.

Part 3: 15 minutes

- V) Extra questions if time
 - a. Give students recruitment email and ask them to read it

- i. What about this email would make you less likely to respond to the survey?
 - ii. What is not clear in this email?
 - iii. What should be emphasized more in the email?
 - iv. What is missing from the email?
 - v. What should be taken out of the email?
- b. Do you think students whose parents are highly involved in their education (i.e. come to parents weekend, come to visit, help students pick out classes, etc) will be less likely to engage in problem drinking?
Why/Why not?
- c. If a parent learns that their child is engaging in problem drinking while at Maryland, do you think the parent should do anything to intervene?
Why/Why not? If yes, what should they do?
- d. If a student runs into academic, police or security, or health problems related to their drinking, do you think the University should tell the parents about the student's drinking?

APPENDIX D

Interview Guide for Questionnaire

- I) Participant takes web-based survey while being observed by research staff.
 - a. Probe any spontaneous non verbal expressions (frowns, chuckles etc.) that are observed during survey.
- II) In-depth, one-on-one interview with participant
 - a. Were there any parts of the survey which were not clearly legible on the computer screen?
 - b. What could make the on-line survey more aesthetically pleasing?
 - c. Were there any parts of the survey which you didn't know how to navigate?
 - d. Was it clear how to submit the survey?
 - e. Was it clear how to indicate your answer for each question?
 - f. Were there any questions that you didn't understand?
 - g. Were there words or phrases that seemed oddly old fashioned or not relevant to college students of your age? If so, what words would be more meaningful to college students of your age?
 - h. Were there any questions that made you feel uncomfortable? If so, which questions and why?
 - i. Were there any questions that you were unable to answer? If yes, which questions and why?
 - j. Did you have any questions about the response choices for any item in this section?



Social Influences on First Year Students' Health

This questionnaire should take about 15 minutes. You must complete the survey within one hour or the survey will time out. Please complete the survey alone and please do not share your password with anyone. **You must submit a completed survey to be entered into the drawing.**

SECTION A. This first set of questions asks about your experiences **before you began school at the University of Maryland (UMD)**. In these questions, a drink does not include a few sips of wine for religious purposes. A drink is a glass of wine, a wine cooler, a shot of hard liquor such as rum, gin, vodka or whiskey, a mixed drink, or similar portion of alcohol.

| | |
|---|-------------------------------------|
| A1. During your senior year of high school how often, on average, did you drink alcohol? | <input type="text" value="Never"/> |
| A2. On those occasions when you drank during your senior year of high school , how many drinks did you usually have? | <input type="text" value="1 or 2"/> |

| | | | | | |
|--|------------|--------------|-------------------|-------------|--------------|
| | Not at all | A Little Bit | A Moderate Amount | Quite a Bit | A Great Deal |
| | | | | | |

| | | | | | |
|--|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| A3. Prior to beginning school at UMD , how much did your parent/guardian talk with you about the effects of alcohol on making decisions? | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| A4. Prior to beginning school at UMD , how much did your parent/guardian talk with you about the dangers of drinking and driving? | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| A5. Prior to beginning school at UMD , how much did your parent/guardian talk with you about the risks of combining drinking and sex? | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

SECTION B. Remember, a drink is a glass of wine, a wine cooler, a shot of hard liquor such as rum, gin, vodka or whiskey, a mixed drink, or similar portion of alcohol.

These questions ask about what you did over the **recent Spring Break**.

| | No days | 1 Day | 2-3 Days | 4-5 Days | 6 or More Days |
|--|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| B1. During Spring Break, on how many days did you have a drink containing alcohol? | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| B2. During Spring Break on how many days did you have five or more drinks? | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

| | |
|---|-------------------------------------|
| B3. During Spring Break, how many drinks containing alcohol did you have on a typical day when you were drinking? | <input type="text" value="1 or 2"/> |
|---|-------------------------------------|

| | |
|--|---|
| B4. Where did you spend Spring Break? | |
| <input type="radio"/> I went home | <input type="radio"/> I went on a trip with my family |
| <input type="radio"/> I stayed on campus | <input type="radio"/> I went on a trip with friends who are in college |
| <input type="text"/> | <input type="text"/> |

| | |
|--|--|
| <input type="radio"/> I went on a trip alone | <input type="radio"/> I went on a trip with friends who are NOT in college |
| | <input type="radio"/> Other |

The remaining questions ask about your life on or off campus since you became a University of Maryland (UMD) student. These questions are NOT about breaks, like Spring Break, when school is not in session.

SECTION C. This set of questions asks about your use of alcohol in general. Remember, a drink is a glass of wine, a wine cooler, a shot of hard liquor such as rum, gin, vodka or whiskey, a mixed drink, or a similar portion of alcohol.

| | Never | Once a Month or Less | Two to Four Times a Month | Two to Three Times a Week | Four or More Times a Week |
|--|-----------------------|-----------------------|---------------------------|---------------------------|---------------------------|
| C1. Since you began college at UMD, in general how often do you have a drink containing alcohol? | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| C2. Since you began college at UMD, how often do you have five or more drinks on one occasion? | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

| | |
|--|-------------------|
| C3. Since you began college at UMD, how many drinks of alcohol do you have on a typical day when you are drinking? | <div>1 or 2</div> |
|--|-------------------|

SECTION D. Between each pair of opposites, please indicate your feeling towards alcohol use on a scale from 1 to 5.

| | | | | | | | |
|-----|------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----|
| | | 1 | 2 | 3 | 4 | 5 | |
| D1. | Good | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Bad |

| | | | | | | | |
|-----|---------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|------|
| | | 1 | 2 | 3 | 4 | 5 | |
| D2. | Foolish | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Wise |

| | | | | | | | |
|-----|----------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|------------|
| | | 1 | 2 | 3 | 4 | 5 | |
| D3. | Pleasant | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Unpleasant |

| | | | | | | | |
|-----|-------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------|
| | | 1 | 2 | 3 | 4 | 5 | |
| D4. | Unfavorable | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Favorable |

SECTION E. Please answer the following items by using the answer key provided. Remember, these questions ask about your life on or off campus since you became a University of Maryland (UMD) student. These questions are NOT about breaks, like Spring Break, when school is not in session.

| | No, not while a UMD student | Once as a UMD student | 2 times as a UMD student | 3 times as a UMD student | 4 or more times as a UMD student |
|--|-----------------------------|-----------------------|--------------------------|--------------------------|----------------------------------|
| E1. Have you driven a car when you knew you had too much to drink to drive safely? | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| E2. Have you had a headache (hangover) the morning after you had been drinking? | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| E3. Have you felt very sick to your stomach or thrown up after drinking? | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| E4. Have you shown up late for work or school because of drinking, a hangover, or an | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

| | | | | | |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| illness caused by drinking? | | | | | |
| E5. Have you not gone to work, or missed classes at school because of drinking, a hangover, or an illness caused by drinking? | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| E6. Have you gotten into physical fights when drinking? | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| E7. Have you ever gotten into trouble at work or school because of drinking? | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| E8. Have you ever been fired from a job or suspended or expelled from school because of your drinking? | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

| | | | | | |
|---|-----------------------------|-----------------------|--------------------------|--------------------------|----------------------------------|
| | No, not while a UMD student | Once as a UMD student | 2 times as a UMD student | 3 times as a UMD student | 4 or more times as a UMD student |
| E9. Have you damaged property, set off a false alarm, or other things like that after you had been drinking? | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| E10. Has anyone ever complained to you about your drinking? | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| E11. Has drinking ever gotten you into sexual situations which you later regretted? | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| E12. Have you ever received a lower grade on an exam or paper than you should have because of your drinking? | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| E13. Have you ever been arrested for drunken driving, driving while intoxicated, or driving under the influence of alcohol? | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| E14. Has your drinking ever | | | | | |

| | | | | | |
|--|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| created problems in your relationships with others? | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| E15. Have you ever lost friends (including boyfriends or girlfriends) because of your drinking? | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| E16. Have you ever neglected your obligations, your family, your work, or school work for two or more days in a row because of your drinking? | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| E17. Have you ever received a citation or been arrested because of drunken behaviors? | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| E18. Have you awakened the morning after a good bit of drinking and found that you could not remember part of the evening before? | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| E19. Have you ever had "the shakes" after stopping or cutting down on drinking (for example, your hands shake so that your coffee cup rattles in the saucer or you have trouble lighting a cigarette)? | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| E20. Have you ever felt like you needed a drink just after you had gotten up (that is, before breakfast)? | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

| | | |
|--|-----------------------------|-----------------------|
| | No, not while a UMD student | Yes, as a UMD student |
| E21. Have you ever found that you needed larger amounts of alcohol to feel any effect, or that you could no longer get drunk on the amount that used to get you drunk? | <input type="radio"/> | <input type="radio"/> |
| E22. Have you ever felt you needed alcohol or were dependent on alcohol? | <input type="radio"/> | <input type="radio"/> |
| E23. Have you ever felt guilty about your drinking? | <input type="radio"/> | <input type="radio"/> |

| | | |
|--|-----------------------|-----------------------|
| E24. Has your doctor ever told you that your drinking is harming your health? | <input type="radio"/> | <input type="radio"/> |
| E25. Have you ever gone to anyone for help to control your drinking? | <input type="radio"/> | <input type="radio"/> |
| E26. Have you ever attended a meeting of Alcoholics Anonymous because of concern about your drinking? | <input type="radio"/> | <input type="radio"/> |
| E27. Have you ever sought professional help for your drinking (for example, spoken to a physician, psychologist, psychiatrist, alcoholism counselor, clergyman about your drinking)? | <input type="radio"/> | <input type="radio"/> |

SECTION F. The next questions have to do with how you and your parent (s)/guardian(s) get along in general. Please indicate how much you agree with each of the following sentences.

| | Strongly Disagree | Somewhat Disagree | Neither Agree nor Disagree | Somewhat Agree | Strongly Agree |
|---|-----------------------|-----------------------|----------------------------|-----------------------|-----------------------|
| F1. I can discuss my beliefs with my parent(s)/guardian(s) without feeling restrained or embarrassed. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| F2. Sometimes I have trouble believing everything my parent(s)/guardian(s) tell me. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| F3. My parent(s)/guardian(s) are always good listeners. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| F4. I am sometimes afraid to ask my parent(s)/guardian(s) for what I want. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| F5. My parent(s)/guardian(s) have a tendency to say things to me that would be better left unsaid. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| F6. My parent(s)/guardian(s) can tell how I'm feeling | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

| | | | | | |
|--|-----------------------|-----------------------|----------------------------|-----------------------|-----------------------|
| without asking. | | | | | |
| F7. I am very satisfied with how my parent(s)/guardian(s) and I talk together. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| F8. If I were in trouble, I could tell my parent(s)/guardian(s). | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| F9. I openly show affection to my parent(s)/guardian(s). | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| F10. When we are having a problem, I often give my parent(s)/guardian(s) the silent treatment. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| | Strongly Disagree | Somewhat Disagree | Neither Agree nor Disagree | Somewhat Agree | Strongly Agree |
| F11. I am careful about what I say to my parent(s)/guardian(s). | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| F12. When talking to my parent(s)/guardian(s), I have a tendency to say things that would be better left unsaid. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| F13. When I ask questions, I get honest answers from my parent(s)/guardian(s). | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| F14. My parent(s)/guardian(s) try to understand my point of view. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| F15. There are topics that I avoid discussing with my parent(s)/guardian(s). | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| F16. I find it easy to discuss problems with my parent(s)/guardian(s). | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| F17. It's very easy for me to express all my true feelings to my parent(s)/guardian(s). | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| F18. My parent(s)/guardian | | | | | |

| | | | | | |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| (s) nag/bother me. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| F19. My parent(s)/guardian(s) insult me when they are angry with me. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| F20. I don't think I can tell my parent(s)/guardian(s) how I really feel about some things. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

SECTION G. The following questions pertain to topics that **you and your parents/guardians** have discussed **SINCE you began school at the University of Maryland (UMD)**. If you are unsure of an answer, please answer to the best of your knowledge.

| Since I began school at UMD, my parent(s)/guardian(s) and I have discussed... | Not at all | A Little Bit | A Moderate Amount | Quite a Bit | A Great Deal |
|--|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| G1. How alcohol works in the body | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| G2. How difficult it is to make accurate judgments of how drunk you are | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| G3. Alternatives to drinking to celebrate special occasions | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| G4. The importance of being able to improve your mood without the use of alcohol | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| G5. The negative consequences of mixing alcohol and sex | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| G6. How alcohol can create a false sense of power | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| G7. How alcohol can get in the way of making true friends | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| G8. Alternatives to falling asleep easier without drinking | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| G9. How drinking can make problems worse, not better | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| G10. How to find fun things to do instead of drinking | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| G11. The importance of not being pressured | | | | | |

| | | | | | |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| by others into drinking | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| G12. How drinking does not really make you "grown up" | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| G13. How drinking can make you physically sick | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| G14. How drinking could get you into trouble with the police | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| G15. The negative things that would happen if you were caught drinking by the police | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| G16. How drinking could lead to serious drinking problems | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| G17. How drinking is bad for your health | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| G18. Drunk driving and its consequences | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| G19. How alcohol changes your personality | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| G20. What the punishment would be if you were caught drinking | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| | Not at all | A Little Bit | A Moderate Amount | Quite a Bit | A Great Deal |
| G21. About the risk of riding in a car with someone who has been drinking | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| G22. The importance of being committed to a healthy lifestyle | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| G23. The ways that alcohol can impair your judgment | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| G24. How mixing alcohol with medications and other drugs can be dangerous | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| G25. How embarrassing it would be for the family if you were caught drinking | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| G26. How being caught drinking might lead to being made fun of by your friends | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| G27. How being caught drinking might make your friends' parents prohibit them from hanging out with you | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| G28. How being caught drinking might lead to suspension from school | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| G29. How being caught drinking might result in publication of your arrest in the newspaper | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

| | | | | | |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| G30. How social drinking may lead to alcoholism | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| G31. The effects of alcohol on making decisions | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| G32. The dangers of drinking and driving | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| G33. The risks of combining drinking and sex | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

G34. Which parent/guardian has talked with you the most about drinking alcohol **since you began school at the University of Maryland? Check all that apply.**

| | |
|---|--|
| <input type="checkbox"/> My biological mother | <input type="checkbox"/> My biological father |
| <input type="checkbox"/> My step mother | <input type="checkbox"/> My step father |
| <input type="checkbox"/> My adoptive mother | <input type="checkbox"/> My adoptive father |
| <input type="checkbox"/> Other guardian | <input type="checkbox"/> My parents/guardians really haven't talked with me about it |

SECTION H. These next questions asks you about the likelihood that you would experience certain effects if you drank alcohol. Even if you've never had a drink of alcohol, you can answer what you think would happen if you drank.

| If I were under the influence from drinking alcohol... | Very Unlikely | Unlikely | Neutral | Likely | Very Likely |
|---|-------------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| H1. My responses would be slow | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| H2. I would have difficulty thinking | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| H3. I would neglect my obligations | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| H4. I would act aggressively | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| H5. I would act tough | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| H6. I would feel moody | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

| How serious would it be if you were under the influence of alcohol and... | Very Serious | Serious | Neutral | Not Very Serious | Not at All Serious |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| H7. Your responses were slow? | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| H8. You had difficulty thinking? | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| H9. You neglected your obligations? | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| H10. You acted aggressively? | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| H11. You acted tough? | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| H12. You were moody? | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

SECTION I. These questions ask about how much your parents/guardians would approve/disapprove of your drinking.

[illegible]

| | | | | | | |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| heavily on a regular basis? | | | | | | |
| I4. To what extent would your father/male guardian approve of you drinking occasionally? | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I5. To what extent would your father/male guardian approve of you drinking regularly? | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I6. To what extent would your father/male guardian approve of you drinking heavily on a regular basis? | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

| | | | | | |
|--|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| | Not at all important | Not very important | Neutral | Important | Very important |
| I7. How important is your mother/female guardian's opinion to you? | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I8. How important is your father/male guardian's opinion to you? | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

SECTION J. This set of questions asks you about your parents/guardians' drinking habits. Remember, your answers are completely confidential.

| | | | | | |
|--|--|--|--|--|--|
| | | | | | |
|--|--|--|--|--|--|

| | Never | Rarely | Sometimes | Frequently | Very Often | I don't have a mother/father |
|--|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|------------------------------|
| J1. How often does your mother/female guardian have a drink of alcohol? | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| J2. How often does your mother/female guardian drink a lot of alcohol? | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| J3. How often does your father/male guardian have a drink of alcohol? | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| J4. How often does your father/male guardian drink a lot of alcohol? | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

SECTION K. These last questions ask about you so that researchers may group your answers appropriately. Remember, your name will not be linked to any of your answers.

;

| | | | | |
|----------------------|--------------------------------|--------------------------------|------------------------------|----------------------------------|
| K1. How old are you? | <input type="radio"/> Eighteen | <input type="radio"/> Nineteen | <input type="radio"/> Twenty | <input type="radio"/> Twenty-one |
|----------------------|--------------------------------|--------------------------------|------------------------------|----------------------------------|

| | | |
|--------------------------|----------------------------|------------------------------|
| K2. What is your gender? | <input type="radio"/> Male | <input type="radio"/> Female |
|--------------------------|----------------------------|------------------------------|

K3. How do you usually describe yourself? **Check all that apply .**

| | |
|---|---|
| <input type="checkbox"/> White - not Hispanic (includes Middle Eastern) | <input type="checkbox"/> Asian or Pacific Islander |
| <input type="checkbox"/> Black - not Hispanic | <input type="checkbox"/> American Indian or Alaska Native |
| <input type="checkbox"/> Hispanic or Latino | <input type="checkbox"/> Other |

| | | |
|---------------------------------------|---------------------------|--------------------------|
| K4. Are you an international student? | <input type="radio"/> Yes | <input type="radio"/> No |
|---------------------------------------|---------------------------|--------------------------|

K5. Where is your permanent residence?

| | |
|--|--|
| <input type="radio"/> Within a HALF hour drive from the university | |
| <input type="radio"/> Within a ONE hour drive from the university | |
| <input type="radio"/> Within a TWO to THREE hour drive from the university | |
| <input type="radio"/> Within a THREE to FIVE hour drive from the university | |
| <input type="radio"/> More than a FIVE hour drive from the university | |

K6. With which parent/guardian do you permanently reside? **Check all that apply.**

| | |
|---|---|
| <input type="checkbox"/> My biological mother | <input type="checkbox"/> My biological father |
| <input type="checkbox"/> My step mother | <input type="checkbox"/> My step father |
| <input type="checkbox"/> My adoptive mother | <input type="checkbox"/> My adoptive father |
| <input type="checkbox"/> Other guardian | <input type="checkbox"/> My permanent residence is not with a parent/guardian |

| | | |
|---|---------------------------|--------------------------|
| K7. Are you a member of a social fraternity or sorority? (National Interfraternity Conference, National Pan-Hellenic Conference, or National Pan-Hellenic Council) | <input type="radio"/> Yes | <input type="radio"/> No |
|---|---------------------------|--------------------------|

| | | |
|--|---------------------------|--------------------------|
| K8. Are you a member of any intercollegiate sports team? | <input type="radio"/> Yes | <input type="radio"/> No |
|--|---------------------------|--------------------------|

K9. ID # **(This field must be completed or your data may be lost. Your ID # is contained in the email with the survey link)**

Submit Survey

APPENDIX F

Abstract

Many college students, as well as college campuses and communities, experience at least some negative effects of excessive and underage drinking such as alcohol related injury and assault, sexual abuse, unsafe sex, academic problems, suicide attempts, drunk driving, legal problems, and alcohol related death. Parental influences have been found capable of delaying adolescent drinking and reducing riskier adolescent drinking behaviors (i.e. binge drinking). However, there has been little investigation regarding the influence parents may have on the drinking behaviors of college students while students are at school. In this investigation, a web-based survey will be conducted with 350 University of Maryland first year students who are 18-19 years old and living in residence halls. Focus groups (n=20), in-depth interviews (n=5) and pilot tests (n=5) will be conducted to assist investigators in developing the web-based survey. Survey data collected will include students' perceptions of the parental behaviors and student drinking behavior. It is hypothesized that student's who report greater parental communication regarding alcohol will be less likely to report problem drinking than students who report less communication.

Subject Selection

University of Maryland (UM) undergraduate students will be asked to participate in the study. Students will be eligible to participate in the developmental phase if they are 18-20 years old, are second year students and lived in a university residence hall during their first year. Students will be eligible to participate in the implementation phase if they are 18-19 years old, are first year students, and reside on campus in a university residence hall. Students will be asked to participate in the developmental (n=30) or implementation (n=467) phases of the project. About equal numbers of males and females will be recruited for each phase.

Developmental Phase

The developmental phase includes focus groups (n=20), an observed pre-test with in-depth interviews (n=5), and a pilot test (n=5) of the survey. Focus group participants and observed pre-test/in-depth interview participants will be recruited from Health classes. After making arrangements with the class instructor, a researcher will recruit students during the first five minutes of class time. The researcher will describe the study and the developmental activity for which participants are being sought. S/he will describe the procedures to be used, the risks and benefits of participating, the voluntary nature of the study, and the right to withdraw. The researcher will also describe the incentive for participating. The developmental activity will be held immediately after the class in which the researcher recruited in a private area of the same building.

Pilot test participants will be recruited from UMCP residence halls. Second year students who are 18-19 years old and living in University residence halls will be randomly selected to participate in the pilot test using the same procedures as described below for the implementation phase. Students randomly selected from a list of eligible students obtained from the Registrar will be sent a personalized letter inviting them to participate in the pilot test. The letter will let the participants know that they will be receiving an email in two days time that will contain a link to the study survey. A copy of the informed consent form will be attached to the letter and will explain the purpose of the study, what participation will entail, the risks and benefits of participating, the voluntary nature of the study, and the right to withdrawal from the study at any time. A token incentive such as a pen or magnet will be included in the letter. The invitation letter is attached (Appendix A).

Implementation Phase

Four hundred sixty-seven students will be recruited for the implementation phase of the study. The sampling frame will be a comprehensive list of all first year students who reside on campus and are 18-19 years old. This list will be obtained from the UMCP Office of the Registrar. The list will include each student's name, address, email, address, phone number, gender, date of birth, major, and college under which they study. Students' names, email addresses, and addresses are published in the University Student Directory. Computerized random sampling from the numbered sample frame will be used to sample 467 students for recruitment. The students corresponding to the numbers

generated will be invited to participate in the study. The students randomly selected to participate will receive a personalized introductory letter printed on university letterhead by campus mail. The letter will notify the participant that in two days time an email message will be sent to their student email address and that a hypertext link contained in the message, when clicked, will open their computer's web browser to the site hosting the survey. A copy of the informed consent form will be attached to the letter and will provide the details of the study (purpose of the study, risks, benefits, voluntary nature of the study, right to withdraw, the incentives for participating). A token incentive such as a pen or magnet will be included with the letter. The invitation letter will also contain the investigator's email address and phone number for students to call if they wish to decline participation or if they have any questions about the study.

Assuming a 75% response rate, 350 students are expected to agree to participate. If additional participants are needed for 350 completions after the initial sampling phase additional random blocks of 50 students will be recruited until a total of 350 students participate.

Procedures

Developmental Phase

Thirty students will participate in the developmental phase. In the developmental phase, two types of focus groups will be conducted. First, 10 students will participate in a focus group to obtain qualitative feedback regarding the parent-student relationship and alcohol use among college students. This input will assist study staff in developing the survey. In the second focus group, 10 students will take a paper-based version of the survey and then participate in a group conversation regarding the ease with which they comprehended survey questions and answers, questionnaire flow, and the face validity of the questions. For both types of focus groups, dialogue will be recorded by an audiocassette and notes will be recorded by a note taker. Topic guides for these focus groups are attached (Appendix B).

After questionnaires have been revised based on the focus group discussions, 5 students will individually participate in the web-based survey while being observed by a member of the study staff. This observed pretest will serve as a check for difficulties in navigating, completing and submitting the survey. Students will print out a hard copy of their responses so that transfer of data from the on-line survey to the data file can be checked for accuracy. Following survey administration, the students will individually participate in in-depth, probed interviews in which students will be asked about the ease with which they navigated, completed and submitted the survey. In-depth interviews will be audio taped and a note taker will record notes. A summary of findings will be prepared and the questionnaire will be revised accordingly. The interview guide is attached (Appendix B).

Focus groups and observed pre-test/in-depth interviews will be held in a private area of the building and immediately after the class in which the researcher recruited. Once in the private area, the researcher will review the appropriate informed consent form with students. Students will then sign the informed consent prior to initiation of developmental activities. Informed consent forms are attached to this document (Appendix C). Following the activity, students will be given the incentive.

The final on-line survey will be pilot tested by having 5 students complete the survey remotely from a computer of their choice. Students will print out a hard copy of their responses and send them to the study office through campus mail in a pre-addressed envelope so that transfer of data from the on-line survey to the data file can be checked for accuracy. Following survey submission, students will be contacted by phone by a research assistant. The research assistant will ask the student if they had any problems navigating or submitting the survey. The purpose of the pilot study is to ensure that the on-line data collection system and procedures function properly. Procedures for the pilot study are identical to those described below for the implementation phase.

Focus groups and observed pretest/in-depth interviews are expected to last between 1 and 1 1/2 hours. Participation in the pilot survey will take 10-15 minutes. Students will receive a gift coupon worth \$5 for participating in any developmental phase activity.

Implementation Phase

In the implementation phase, 350 students will complete a 15 minute web-based survey during the Spring 2004 semester. A draft version of the survey is attached to this document (Appendix D). The final version of the survey will be resubmitted to the IRB for approval before implementation.

After receiving their invitation letter, students will receive an email containing a hyperlink to the survey site and a unique password. A copy of the invitation letter and the informed consent form will be attached to the email. The email will be generated using mail merge software so that each message is personally addressed and sent individually, not as part of a bulk transmission. The email will be sent two days after the letter is expected to arrive at the students' residence halls so that students will have an opportunity to read the letter and receive the token incentive. The email will inform students that they must complete the survey alone, that they should not share the survey URL or their password with anyone, and that in the event that they submit more than one survey, only the first submission will be accepted. Students will click on the hyperlink and their web-browser will open to the survey site. Students will enter their password and will automatically be connected to the electronic informed consent. The use of a password will enable tracking of survey completion, allow identification of participants who submit more than one survey, and prevent non-study participants from accessing the survey.

Once students read and electronically sign the informed consent form (check a box indicating that they have read and agree to the terms in the informed consent), the survey will open and participants will have one hour to complete it, after which the survey will time-out. Participants will not receive an incentive without completing and submitting a survey. (Participants will be notified of these parameters in the email containing the link and also at the start of the survey). Following receipt of the email containing the survey link, participants will have three days to complete the survey. If within three days of receiving the email the participant has not completed his/her survey (as indicated by the survey database) they will receive a second email. This email will contain the same information as was contained in the first survey email as well as an emphasis on the importance of completing the survey for issues of study integrity. After three days have passed, if the student has still not completed the survey they will receive a phone call from study staff to check to see if they have received the emails and to ask if they are willing to participate. Up to five reminder phone calls will be placed to students who have not responded, unless the student has communicated to study staff that they do not wish to participate. Every attempt will be made to personally speak to the participant. If the participant cannot be reached the caller will leave a message if possible. If a student indicates that they do not wish to complete the survey on the web, a hard copy consent form and survey will be sent to the student. They will complete both the consent form and the survey and return it to the study office through campus mail.

All correspondence with participants will include a telephone number for participants to call if they have questions or concerns about the study. Upon completion of the survey, participants will be entered into a drawing to win a \$100 gift coupon to Barnes and Noble bookstores.

Risks and Benefits

Risks to participants are minimal. Possible risks are psychological in nature. It is possible that participants may become upset as a result of completing the questionnaire or participating in the developmental phases of the study. On-campus educational and mental health resource guides and contact information will be offered. Participants may withdraw from the study at any time. Students who become concerned about their alcohol use will be referred to the University Health Center for further support.

It is possible that participants may receive no benefit from participating in the investigation. It is hoped that information learned from this study may benefit other college students in the future.

Confidentiality

Confidentiality of data will be maintained at all times. Developmental phase data will be stored under lock and key. Data from the developmental phase will be stored without personal identifiers. Computer data files will also be devoid of personal identifiers, and subject data will be assigned a unique identifier developed only for study purposes. Computer data files will be password protected. Only the investigator and three advisors

will know the location of the text data file on the server. UMCP undergraduate students will not be used for face-to-face data collection as part of focus groups, probed interviews, or observed survey testing to protect participants' confidentiality and avoid making participants uncomfortable about sharing sensitive information should the research assistant be someone they recognize or know.

Participants' survey responses will be automatically entered into a project database on a server at the University of Maryland, eliminating the need for data entry and protecting the anonymity of respondents. Only the PI will have ready access to the database that links study ID to student name, which will be password protected. Staff involved in tracking participants and sending follow-up messages will only have access to the codebook linking the ID/password combinations with participant identifiers under the supervision of the PI. The PI will ensure that participants' survey responses are not linked to their names. Data will be destroyed when it is no longer needed for research purposes. Hard copy data and consent forms will be shredded, computer files will be deleted, and audio tapes will be cut.

Information and Consent Forms

Participants in all phases of the study will read and agree to consent forms. The participants will be provided the purpose of the study, the department that is facilitating the study, and the name and phone number of the Principle Investigator. Participants will be given a description of what participation will entail and the risks and benefits of participating in the study. Finally, they will be informed of the confidentiality of their statements and identifying information and of the freedom to withdraw from the study at any time. For focus groups and observed pre-test/in-depth interviews, Research Assistants will review the informed consent with participants, will explain in detail what participation entails, the purpose of the study, the risks and benefits of participating, the voluntary basis of the study and the right to withdraw at any time.

The students randomly selected to participate will receive a personalized introductory letter by campus mail with a copy of the informed consent which will explain the purpose of the study, what participation in the study will entail, and the risks, benefits and incentives for participating. The letter and email will provide the researchers' telephone number to call if they have questions or would like to decline participation in the study. Students will be asked to read and electronically sign an electronic informed consent form before being allowed to proceed to the web survey. The introductory letter and the informed consent forms are attached to this document (Appendices A and C).

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