Brief motivational interviewing: an intervention for alcohol abusing college students

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Brief Motivational Interviewing:
An Intervention for Alcohol Abusing College Students

by

Kelly J. Horner

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Abstract

Efforts to curtail alcohol abuse in college with traditional alcohol education programs have been unsuccessful as heavy drinking on college campuses has remained remarkably constant. Brief Motivational Interventions (BMIs) have recently emerged as a viable alternative that facilitates behavior change in students who engage in heavy drinking. The present study recruited college students who violated campus drinking policies and were referred to the University’s judicial system. The efficacy of an individualized BMI intervention was compared to that of a group oriented educational intervention and a control condition consisting of a sanction. Possible interaction effects between specific individual characteristics and the assigned intervention approaches were explored. Under these circumstances the two treatment interventions and the control conditions did not demonstrate differential effects across treatment. However, all conditions showed modest significant effects for reductions in drinking behaviors that were maintained through to 3-month follow-up. The readiness to change did not reflect similar significant results. Future studies should continue to investigate the efficacy of BMIs with mandated students, and the utility and necessity of interventions beyond sanctions.
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# Table of Contents

## CHAPTER 1 – Introduction

- Introduction ................................................................. 1
- Consequences of Drinking: A Brief Review .......................... 2
- Brief Overview of Alcohol Interventions with College Students .......................... 5
- Overview of the principles of Motivation Interviewing ................. 11
- Adaptations of Brief Motivational Interventions ......................... 13
- The Broad Scope of Treatment Outcome for MI: An Overview .......... 17
- Why BMI is better suited for Risky Drinkers ........................... 21
- Rationale and Hypotheses ................................................. 23

## CHAPTER 2 – Review of the Literature

- Review of Non-evidenced based Interventions (Traditional Programs) ........... 25
- Cognitive-Behavioral Skills-based programs .......................... 33
- BMIs with General College Population ................................. 41
- BMIs with Targeted High Risk Populations ............................. 52

## CHAPTER 3 – Methods

- Participants ................................................................. 61
- Measures ................................................................. 61
- Procedures ............................................................... 64
- Treatment Protocols .................................................... 71

## CHAPTER 4 - Results

- Results ................................................................. 70

## CHAPTER 5 - Discussion

- Discussion ............................................................... 77
# REFERENCES

References ............................................................................................................. 93

# TABLES

Table 1 .................................................................................................................. 114
Table 2 .................................................................................................................. 115
Table 3 .................................................................................................................. 116
Table 4 .................................................................................................................. 117

# FIGURES

Figure 1 .................................................................................................................. 119
Figure 2 .................................................................................................................. 120
Figure 3 .................................................................................................................. 121

# APPENDICES

APPENDIX A. Structured Interview ................................................................. 124
APPENDIX C. Feedback Summary ................................................................. 131
APPENDIX D. Tips and Facts Sheet ............................................................... 133
APPENDIX E. Letter ............................................................................................ 135
Brief Motivational Interviewing: An Intervention for Alcohol Abusing College Students

High-risk drinking on college campuses has become an increasingly more pervasive problem that affects individual problem drinkers, their peers, and the college community as a whole. Although the college experience has not been identified as the “cause” of heavy drinking, it is the time when these drinking practices are more frequently identified, and thus risky alcohol consumption becomes a “college problem.” More than half of the tens of thousands of violations and arrests on college campuses involve the use of alcohol (Presley, Meilman & Leichliter, 2002) and the number of students who are mandated for services continues to grow (Wechsler et al., 2002a; Monti, O’Leary Tevyaw, & Borsari, 2004). Not surprisingly, campus officials consider alcohol use the single most important factor that adversely affects the quality of campus life (NIAAA 2004).

Over 90% of students report drinking at least once during their college experience, and 72% report drinking at least once within the last 30 days (CORE 2004, Barnes, Welte, & Dintcheff, 1992; Wechsler & Isaac 1992; Wechsler, Molnar, Davenport, & Baer, 1999). College students consider drinking a rite of passage that is expected and accepted as part of the college experience. Thus, occasional drinking in college must be considered normative. However, there is growing concern over the fact that approximately 44% of students are classified as risky episodic drinkers, also referred to as binge drinkers. A binge has been defined as the consumption of four (females) or five (males) drinks in one sitting. This definition has recently been revised by specifying that the four or five drinks must be consumed *within a period of two hours* to constitute
binge drinking (NIAAA, 2004). *Frequent* episodic drinking refers to binge drinking that occurs three or more times during a two-week period (Wechsler & Nelson, 2001).

Students classified as *frequent* episodic drinkers have increased from 20% in 1993 to 23% in 1999 (Wechsler, Lee, Kuo, & Lee, 2000). This subgroup of drinkers (23%) consumes 68% of the alcohol imbibed by students (Wechsler et al., 1999).

*Consequences of Drinking: A Brief Review*

Alcohol abuse in college is associated with a variety of problems. Students who drink heavily are more often involved in fighting, have problems with family and friends, show poor academic performance, and experience a variety of health risks (Block & Ungerleider, 1985; Berkowitz & Perkins, 1986). Heavy drinkers are also 7 to 10 times more likely to suffer an injury, drive under the influence, engage in unprotected or unplanned sexual intercourse, vandalize school property, and get arrested by police (Wechsler, Dowdall, Davenport, & Rimm, 1995). In fact, 92% of the students who reported five or more alcohol-related problems in the previous year were identified by the four/five measure as risky episodic drinkers (Wechsler, 2000). These problems fall into three spheres ranging from the more personal to the more global.

*Damage to Self*

This spectrum of consequences includes academic problems, personal injuries, and high-risk sexual activity.

*Academic Problems.* Findings have consistently shown that alcohol use and misuse is positively related to academic problems (Wood, Nagoshi, & Dennis, 1997), and negatively related to grade point average (Presley, Meilman, & Lyerla, 1993). Approximately 25% of college students report negative effects of their drinking practices.
The more common problems include missing class, falling behind, poor performance on exams and papers, and receiving lower grades (Presley, Meilman, & Cashin, 1996a, 1996b; Wechsler et al., 2002). More recent studies have found that missing class after drinking increased from 9% to almost 12%; missing class due to a hangover increased from 26% to 28%; and lower grades due to drinking increased from 5% to 7% (Engs 2001b; Engs & Hanson 1994, 1999; Wolfson & Hourigan 1997).

**Personal Injuries.** This spectrum of physical injuries is very broad and ranges from more benign injuries to fatal accidents. The most severe physical consequence of heavy drinking has typically been reported as alcohol poisoning and an ensuing fatal coma. However, excessive drinking can also result in fatal automobile crashes, falls, and other accidents which traditionally have not been included in the statistics for alcohol-related college fatalities. This is slowly changing. In 1998, the National Institute on Alcohol Abuse and Alcoholism (NIAAA) reported that 1,400 college students between the ages of 18 and 24 died from alcohol-related unintentional injuries, including motor vehicle accidents. More recently, this number has risen to 1,700 (Hingson, Heeren, Winter & Wechsler, 2005).

Reports of non-fatal injuries have been more consistent and accurate. Between 12% - 15% of students who drink experience some type of personal injury while drinking (Hingson, et al., 2005, Wechsler et al., 1998; Presley et al., 1996) and close to 1.5% of students tried to commit suicide within the past year due to their alcohol or drug use (Presley et al., 1998).

Students’ health is also adversely affected by excessive drinking. More than 150,000 students develop alcohol-related short-term illnesses, such as hangovers, nausea,
and vomiting. Some students even develop long-term illnesses, such as upper respiratory ailments, on account of their alcohol abuse (Engs & Aldo-Benson, 1995; Hingson, Heeren, Zakocs, Kopstein, & Wechsler, 2002).

**High Risk Sexual Activity.** Algebra consumption has been consistently linked with high-risk sexual behavior, such as unprotected intercourse, unintended pregnancies, sexual coercion, and rape. Hingson et al. (2002) reported that over 70,000 students were victims of alcohol-related sexual assaults or date rapes. These investigators also found that approximately 400,000 students between the age of 18 and 24 engaged in unprotected intercourse and more than 100,000 reported being too intoxicated to know if they had consensual sex. Finally, evidence showed that students who drank were less likely to use condoms and more likely to misread verbal and nonverbal cues or simply disregard cues against consensual sexual activity.

**Damage to Others**

Students’ drinking not only affects them personally, but since drinking typically occurs in a social context, the environment and those in the environment are also affected. Recent reports have provided estimates of over 600,000 full-time college students either being hit or assaulted by students who have been drinking (Hingson et al., 2002). Students who do not drink regularly or abstain can experience daily problems from those who are heavy drinkers. Some of these more commonly reported “second-hand effects” of alcohol abuse in college involve disrupted sleep and study, taking care of drunken students, insults and humiliation, serious arguments, personal attacks and assaults, property damage, unwanted sexual advances, and sexual assault or date rape.
Damage to Institutions

Studies also report that students who damage property, college residences and local neighborhoods, are more likely to do this while under the influence of alcohol. The findings show that of those students who drink and cause property damage, it is the “high risk” drinkers who cause more overall damage (Engs & Hanson, 1994; Presley et al., 1996; Wechsler et al., 1998).

Summary of Consequences

The college setting represents a formidable challenge for the thousands of students faced with almost daily decisions about alcohol use or misuse. Unlike any other environment, the college setting is unique because of the social atmosphere that focuses on drinking as a “rite of passage.” There is an intense push to conform that many students are unable to resist (Schroeder & Prentice, 1998). Students who violate drinking policies make up a disproportionate number of those who experience the various negative consequences discussed above. It is these students who have the most to gain from concerted efforts of intervention to modify their drinking behavior and the resulting multiplicity of adverse consequences they experience.

Brief Overview of Alcohol Interventions with College Students

In the past two decades the majority of universities have sponsored some form of institution-wide alcohol and drug use prevention programs, with the aim of countering drug and alcohol use on campus (Berkowitz & Perkins 1986; Werch, Pappas & Vogel, 1996). In a review of alcohol programs on campuses it was reported that 98% of universities had a designated site on campus with resource materials related to drug and alcohol use, 74% had a designated alcohol and substance abuse specialist; 60% offered an
undergraduate course that included resources such as written material on alcohol abuse, 90% had specific alcohol awareness days or weeks, and 59% had some type of support group available (Anderson & Milgram, 1996). In 2002, a Task Force on College Drinking was organized by the NIAAA where the evidence on college drinking, its consequences, and prevention efforts employed to reduce drinking behavior were reviewed (NIAAA, 2002). This review highlighted the growing support for brief motivational interventions (BMIs), and prompted a significant shift in both the delivery and research of services for students who drink on campuses, and in particular those students who had traditionally gone underserved and under researched – judicially mandated students.

For the past two decades high-risk drinking has given rise to a significant body of research. The research has predominantly focused more on prevention efforts with students who volunteered to participate. Prevention efforts were originally classified in one of three ways: 1) primary (prevention), 2) secondary (interventions) and 3) tertiary (treatment). This classification divided programs according to the type of efforts made to address the problem of high risk drinking. *Primary* prevention efforts focused on preventing students from starting to drink. *Secondary* efforts focused on students who were engaging in high-risk behaviors. *Tertiary* efforts focused on students who were already considered problem drinkers. In a review by Gordon (1987), the categories shifted to populations being served. This resulted in the following three classifications: 1) universal, 2) selective 3) indicated. *Universal* programs address the general population using an educational approach in an attempt to work with students who do not yet display high-risk behaviors. *Selective* programs target identified groups of students at risk for developing problems (e.g., sororities, fraternities). *Indicated* programming addresses
students already manifesting problem behaviors. More recently, Larimer & Cronce (2002) reviewed the research and reclassified programs based on content and theoretical approach. They introduced the following three categories: 1) educational and awareness programs, 2) cognitive-behavioral skills-based programs, and 3) motivational/harm reduction programs. The overall findings of this most recent review will be presented briefly here, followed by a more detailed discussion of the findings in Chapter 2.

*Educational and Awareness Programs*

The research conducted on educational and awareness programs was further categorized into three different approaches: traditional, values clarification, and norms clarification. Common to all these approaches is the core assumption that students lack the knowledge to make correct choices about drinking. This assumption is believed to be the major contributor to the misuse of alcohol and drugs. Therefore, there is a countervailing assumption that increased knowledge creates changes in behavior, and on this assumption the majority of programs have been designed (Moskowitz, 1989). The underlying assumption is based on a weak or nonexistent theory. Most studies conducted within this framework are fraught with notable methodological flaws (e.g., small sample sizes, high attrition, non-random samples, and no comparison or control groups). Consequently, they have limited value for drawing confident conclusions about the efficacy of this approach of college alcohol prevention research from 1983-1998 and concluded that typical education and awareness based programs (including values clarification) resulted in a minimal effect on behavior (Maddock, 1999). Remarkably, these programs - even with their weak support - are still the most frequently utilized by college campuses to address student drinking concerns (Ziemelis, 1998). Furthermore,
these programs are considered to be particularly ineffective in the absence of other essential components such as skills training, BMIs, or expectancy challenges. In view of these shortcomings, applying traditional programs alone is a significant under-utilization of campus resources (NIAAA, Advisory Council, 2002).

*Cognitive-behavioral skills based programs*

Interventions using *cognitive-behavioral skills training* are newer and incorporate empirically supported information on reducing or modifying beliefs and behaviors associated with high-risk drinking. The techniques utilized in these programs range in specificity from an educational and informational format (e.g., expectancy challenges regarding behavior after use; blood alcohol discrimination training, and self-monitoring/self-assessment of alcohol use or problems) to general lifestyle skills training (e.g., stress-management, time-management, and assertiveness training) (Garvin, Alcorn, & Faulkner, 1990; Murphy, Pagano, & Marlatt, 1986; Rohsenow, Smith, & Johnson, 1985). These studies have been classified according to the techniques used as specific alcohol-focused skill building, self-monitoring, and multi-component alcohol skills training interventions.

The *alcohol-focused skills building approach* (ASTP) draws on students’ direct experience to challenge their beliefs about the effects of alcohol. Research on the effects of expectancy challenges has shown a significant reduction in alcohol consumption with heavy drinking male college students (Darkes & Goldman, 1993; Darkes & Goldman, 1998). This is a promising approach, particularly with males who are heavy drinkers, but more research is needed to confirm that the direct experience component is more efficacious than other approaches. Further research is also necessary to ascertain whether
this approach is similarly effective for female students, since none of the studies to date have assessed changes in expectancies in female students who are heavy drinkers.

The self-monitoring approach simply teaches students how to monitor their drinking behavior and the consequences of their drinking. This approach has had minimal research to date and there is no consistency in the method of self-assessment. However, there is some indication that self-assessment may have utility in promoting behavior change (Cronin, 1996; Garvin et al., 1990; Miller, 1999).

The multi-component approach is varied and no one combination of behavioral skills techniques has been consistently utilized or studied thus far. This approach has received the most attention to date as ten multi-component skills-based variations of ASTP interventions have been presented in seven studies. The interventions often combined alcohol-focused skills with general life skills. Of the ten interventions used, three were found to have no effect on alcohol consumption or the consequences of drinking whereas seven were found to have some effect on alcohol use and associated problems. Most often the programs were variations of the ASTP programs and incorporated a variety of components such as risk feedback techniques, moderate drinking training, blood alcohol concentration, assertiveness skills, self-monitoring, relaxation, general lifestyle balance skills (Ametrano 1992, Garvin et al., 1990; Jack, 1989; Kivlahan et al., 1990; Marcello et al., 1989; Miller, 1999).

Motivational/Harm Reduction Programs

More recently, an approach known as Brief Motivation Interviewing (BMI) has been developed. This intervention has emerged as the most promising approach, particularly with high-risk drinkers. BMI is an adaptation of Miller and Rollnick’s (1995)
Motivation Interviewing (MI).

MI is a theoretically informed evidence-based treatment found to be effective with individuals who abuse or misuse alcohol, in both outpatient and inpatient settings (Miller, Benefield, & Tonigan, 1993; Bien, Miller, & Boroughs, 1993; Brown & Miller, 1993). Akin to MI, BMIs are theoretically grounded in Prochaska and DiClemente’s (1982) transtheoretical model of change (TTM) which is known as the Stages of Change. According to this model, individuals experience change on a continuum and the process of change is a progressive one and not an all or nothing experience. A person can enter the continuum at any point but according to the model the initial stage of change begins with the first stage precontemplation and change as it occurs progresses through the next four stages contemplation, preparation, action, and maintenance. Miller and Rollnick (1995) developed MI by taking these stages of change and created particular strategies that overlay each stage of change. It has been found that the interventions are effective to the degree that the techniques employed are consistent with the individual’s specific stage of readiness to change (Velicer, Prochaska, Fava, Norman, & Redding, 1998; Prochaska & DiClemente 1984).

BMI is also guided by the theory of harm reduction. According to this theory, high-risk drinking occurs on a continuum, change occurs in a stepwise fashion, and abstinence need not be the focus of the intervention (Fromme, Marlatt, Baer, & Kivlahan, 1993). Thus, one can focus on reducing the harmful consequences that can be associated with heavy drinking practices and were covered in detail in the previous chapter such as: lower grades, nausea, accidents causing bodily harm, to name a few.

Thus, BMI incorporates both motivational and harm-reduction components. BMI
is brief (1-2 sessions), non-confrontational, collaborative, and seeks to elicit from
individuals the motivation to change their high-risk behavior. The intervention is flexible,
allows for an individualized approach, and addresses both drinking levels and
motivational levels as they vary from student to student. One of the best formulations of a
BMI approach is a program called Brief Alcohol Screening and Intervention for College
Students (BASICS). This intervention has been explicitly designed for college
populations and has received empirical support (Baer, Marlatt, Kivlahan, Fromme,
Larimer, & Williams, 1992; Dimeff, Baer, Kivlahan, & Marlatt, 1999; Larimer, Turner,
Anderson, Foder, Kilmer, Palmer & Cronce 2001; Marlatt, Baer, Kivlahan, Dimeff,
Larimer, Quigley, et al, 1998; Murphy, Benson, Fuchinich, Deskins, Eskin, Flood et al,
2004; Murphy, Duchnick, Vuchinich, Davison, Kar, Olson, et al, 2001; Borsari & Carey,
2005)

Overview of the Principles of Motivational Interviewing

Motivational Interviewing (MI) was initially not derived from a theory, but was
informed by the intuitive principles of clinical practice that were most in keeping with the
client-centered approach of Carl Rogers (1959). The emphasis on empathic listening combined
with basic understanding has been a key component of MI. Conceptually, MI is also tied to the
theory of cognitive dissonance (Festinger, 1957) and self-perception theory (Bem, 1972). MI
has evolved as a clinical method defined as client-centered and consciously directive and is
best characterized as a counseling style with a set of clinical strategies and skills that focus on
the resolution of ambivalence in the direction of change (Miller & Rollnick, 2002).
Ambivalence is viewed as an intrinsic part of the change process where the vacillation between
wanting to change and not wanting to change occurs (Hettema, Steele & Miller, 2005). This
method has also been seamlessly wedded with the Transtheoretical Model of Change (TTM) (Miller & Rollnick, 1995). Both MI and TTM hold that the responsibility for change lies in the individual and can be experienced once ambivalence is resolved, allowing change talk and commitment to rise.

According to MI, change is broken up into two phases, where Phase I is about increasing and highlighting the motivation to change, and Phase II is about generating and formalizing a commitment to change (Miller & Rollnick, 2002). TTM adds a temporal dimension to the change process that involves five progressive stages. They each are defined by particular behaviors, actions and beliefs. Precontemplation is a stage where individuals do not view their behavior as a problem and they are generally not ready to change. Lectures, advice or suggestions about what to change or how to change are not effective during this stage. Contemplation occurs when individuals are aware there is a problem and a need for change, but they are not yet committed to developing a plan to change. During this phase encouragement, particularly in the form of ultimatums, is not seen as helpful. The next stage is Preparation where “change talk” begins to be more prevalent. Individuals in that stage make comments about committing to change and express ideas about how to make changes. During the action stage, the talk of change turns to formalizing and implementing plans to affect the problem. Individuals use problem solving strategies and note what has worked and not worked. The giving of advice and suggestions is not uncommon during this stage and usually is done judiciously according to the needs of the individual.

An integral part of MI is to assess a person’s stage of change. Then specific techniques are employed by the clinician appropriate to the client’s particular stage. The first phase is to stir up the motivation to change. This is accomplished by asking open-ended questions,
affirming the clients responses, reflectively listening and summarizing statements. Eliciting change talk’ is a fifth strategy that encourages the client to make his or her own arguments for change. Providing ‘personalized feedback’ has also been found to be highly persuasive in eliciting change talk, and is derived from a set of objective tests that summarize an individual’s alcohol use behavior (frequency, quantity and consequences) (Miller & Rollnick, 1991). The second phase is geared towards formalizing the commitment to change using “open ended questions” but with a focus on consolidating a commitment to change. Motivation is the impetus, it increases an individual’s focus, effort and energy, and is vital from the beginning to the end of the process of change (DiClemente & Velasquez, 2002).

For the purpose of this study it is important to note that motivational strategies, in general, have most often been used in the context of interventions such as BMIs (DiClemente & Velasquez, in Miller & Rollnick, 2002) and there is literature to support the utilization of such adaptations (Burke, Arkowitz, & Dunn, 2002). Various adaptations will be discussed, and BASICS, one of the more recent ones, will be further examined for its efficacy with a population that has demonstrated constancy in its drinking behavior.

Adaptations of Brief Motivational Interventions

Drinkers Check-Up (Miller, Sovereign, & Krege, 1988) is one of the first assessment oriented adaptations of MI. It focuses on providing personalized objective feedback to drinkers wanting to know how problematic their drinking has become. Increasing the motivation to change is the focus, and this is done through the feedback process. Individuals participate in two sessions, one geared toward a thorough assessment (2-hours). The second meeting focused on providing feedback (60 minutes). The meetings are designed to increase a person’s awareness of the riskiness and potentially
negative impact of his/her alcohol consumption by drawing strong comparisons to normative data from the general population. Drinkers Check-up interventions have typically been conducted face-to-face (Miller, Sovereign, & Krege, 1988) but have also been found to be effective with no interpersonal interaction, as seen in studies where the feedback summary is mailed or e-mailed (Agostinelli, Brown, & Miller, 1995; Walters, Bennett, & Miller, 2000; Walters & Woodall, 2003; Walters, 2000). There is a Windows based computer program modeled after the Drinkers Check-up and there are also two different web based programs which are also modeled after the Drinker’s Check-up (www.drinkerscheckup.com) (Hester, Squires, Delaney, 2005). The other web-based program called e-CHUG (electronic check up to go) has replicated the findings by Agostinelli, Brown & Miller, (1995) with working adults (Walters & Woodall 2003) and with college students (Walters, 2000; Walters, Bennett, & Miller, 2000).

Motivational enhancement therapy (Miller, Zweben, DiClemente, & Rychtarik, 1992) was adapted from Drinkers Check-up and incorporates the principles of MI. Motivational Enhancement therapy was developed into a manualized four –session intervention and is the most widely used of the BMIs combining MI with personal feedback from assessment results (Miller, et al., 1992; Hettema, Steel, & Miller, 2005). Its efficacy was examined as part of a multisite collaborative investigation known as Project MATCH which sought to compare three psychosocial treatments for those abusing and dependent on alcohol (Project MATCH Research Group, 1997a, 1997b). This research project was one of the largest psychotherapy outcome studies and reported significant differences for all three treatment groups and found no significant between group differences. Motivational Enhancement therapy was the treatment that reported significant improvements at three months and three years. This study included
two empirically supported longer term treatments; Cognitive-behavioral skills therapy (Kadden et al., 1992) and Twelve-step facilitation therapy (Nowinski, Baker, & Carroll, 1992).

Brief Motivational Interventions (Rollnick, Bell, & Heather, 1992) BMI was developed for use in a medical setting with patients who typically were not seeking services related to a drinking problem, but who were deemed heavy drinkers by health care professional (Bien, Miller & Tonigan, 1993). BMI consisted of a single 40-minute session with a patient and represented a more immediate, condensed, and “bare bones” version of MI. While it utilized many of the MI techniques (feedback, emphasis on personal choice, empathy, reinforcing self efficacy, menu of options along with advice giving) it was clearly an adaptation and not true MI because it relied on advice giving quickly and directly and on somewhat heavy-handed persuasion by a professional authority (Miller & Sanchez, 1994; Rollnick & Miller, 1995).

Brief Alcohol Screening and Intervention for College Students (BASICS; Dimeff, Baer, Kivalahan & Marlatt, 1999) evolved from the Drinker Check-up and combines cognitive-behavioral self-management and harm-reduction strategies with motivational enhancement techniques. It has also been referred to as an Alcohol Skills Training Program (ASTP) because it is more multimodal, but of all the ASTPs, BASICS borrows most heavily from MI and therefore is also considered a BMI (Dimeff, Baer, Kivlahan, & Marlatt, 1999). BASICS was first utilized within a health care setting for students who sought medical services but were also assessed for risky drinking behavior (Dimeff, 1997). A treatment manual was then created to assist a variety of service providers on college campuses who work with students considered to be high risk drinkers (Dimeff et al., 1999). Information about a student’s drinking is gathered via a standardized assessment battery and a personalized feedback report is generated and presented using a motivational interviewing approach. Included in the feedback are normative
comparisons to college student drinking and an overview of protective behaviors related to harm reduction. This is generally done in two-sessions.

Summary

Much of the empirical literature on MI is based on one of the adaptations described above. MI has rarely been studied in its pure form. BMIs are typically brief (1-2 sessions), use standardized assessment measures, then compare the individual’s behavior to some form of social norms, this personalized feedback summary is a central focus of one or more meetings with a professional and this material is delivered in a style true to the MI (Miller & Rollnick, 2002). The possibilities of change are explored in a nonconfrontational manner, at the pace and the stage suitable to the client, but notably within the context of a brief intervention, and with the assistance of information gathered through standardized assessments.

From the rapidly emerging body of research it is evident that this approach has garnered considerable attention. Based on several reviews of the literature, the efficacy of BMIs has been highest with individuals who abuse alcohol (Noonan & Moyers, 1997; Dunn, DeRoo, & Rivara, 2001; Burke, Arkowitz, & Dunn 2002; Burke, Arkowitz & Menchola, 2003; Ruback, Sandboek, Lauritzen & Christensen, 2005). A recent meta-analysis concluded that the dose, the format, and the problem area appear to moderate the effect of BMIs (Burke, Arkowitz & Melnchola, 2003).

BMIs have been used to address a wide variety of other problem or risky behaviors, such as smoking cessation, HIV risk behaviors, treatment compliance, water purification behavior, exercising, eating behaviors, gambling, and relationship concerns (Treasure et al., 1999; Hodgins, Currie, & el-Guebaly, 2001; Hettema, Steele, & Miller, 2005; Ruback, Sandboek, Lauritzen & Christensen, 2005). These other areas of concern, while important, are
not relevant to the nature of this study. Therefore, a brief review of the overall BMI research and, most importantly, the research done to date with BMIs and college students which will be reviewed in detail.

*The Broad Scope of Treatment Outcome for MI: An Overview*

The preponderance of support for the use of BMIs comes from research on individuals who abuse alcohol or other substances, a population that has traditionally been difficult to treat and has a high rate of relapse.

Noonan and Moyers (1997) in the first review of BMIs included eleven randomized controlled studies with nine studies of problem drinkers and two of drug abusers. The authors concluded that BMIs were efficacious with a variety of problematic substance use behaviors (alcohol, marijuana, opiate use). Client variables such as severity of impairment were discussed as potential explanations for the variance across effect sizes of each of the studies and raised as worthy of future attention.

Dunn, DeRoo and Rivara (2001) followed with a systematic review of twenty-nine randomized controlled trials examining the effectiveness of BMIs across four behavior domains: diet/exercise, substance abuse, HIV risk, and smoking. Even when compared with other behavior domains, BMIs with substance abuse had the most cumulative supportive evidence. The best evidence of support for any BMI was when it was used as a treatment enhancement for more intensive substance abuse treatment as usual. There was consistency found in both direction and size of the treatment participation and substance abuse outcomes (Aubrey, 1998; Bien et al., 1993; Saunders et al., 1995; Swanson, Pantalon & Cohen, 1999).

Burke, Arkowitz and Menchola (2003) provided the first meta-analysis with thirty controlled clinical trials. This was a multidimensional review that provided analyses beyond
the typical effect sizes and included an array of statistics influencing the variations in the outcome. The meta-analysis looked at the basic characteristics across studies (behavior problems, setting, length of treatment, types of comparison groups); efficacy of BMIs across problem behaviors when compared to other groups (active treatment, control group); sustainability of effect beyond initial response; moderators of the variations in outcome across studies (dose, BMI format, and problem area); and the clinical impact of BMIs on clients and those close to them. The review included many of the studies in the previous reviews, but again predominantly alcohol problem studies. Other problem behaviors were included such as substance abuse, diet and exercise, smoking cessation, HIV-risk behavior, treatment adherence and eating disorders.

This review mainly reported support for the efficacy of BMIs with three of the problem behaviors - alcoholism, drug abuse, and diet and exercise behaviors. In contrast little support was found for smoking or HIV-risk behaviors. BMIs were found to be equivalent to other forms of treatment (with effect sizes ranging from .25 to .57; $ds$ in 0.50 range) and were superior to no-treatment or placebo controls, and these effects were sustained as far out as four years post treatment. Across all studies, it was found that clients who received BMIs had a clinical impact with rates of improvement at 51% and an overall 56% reduction in drinking behavior as compared with 37% clinical impact rates for those who received treatment as usual or no treatment at post treatment. When reviewing all the studies the outcomes varied and 35% of the variance found was explained by the dose of treatment and problem behavior treated.

Another interesting finding was that the attrition rates were deemed reasonably low across all studies and much lower when compared to attrition rates in the general drug abuse literature (Stanton & Shadish, 1997). This review did raise a concern for potential bias in the findings
overall because effects sizes were notably higher for studies done in Miller’s clinic and could be due to a variety of reasons such as investigator bias, superior quality of BMI training and supervision, with ongoing integrity checks (Luborsky et al., 1999).

Hettema, Steele and Miller (2005) also found that most studies reported statistically significant effects when using BMIs but that the variability in overall outcome did not allow for any meaningful average effect size. The findings in general though indicated that again the strongest support for MI was with substance use problem domain. Even when examining studies within a particular problem domain, such as alcohol, it was found that MI treatment for the same target problem yeilded very different effect sizes across sites and populations. Of note in this review it was found that BMIs added at the outset of treatment yield the most consistently high effect sizes. Furthermore, BMIs also offered as stand-alone treatments had effect sizes that faded while those offered as a prelude to another treatment had more lasting effect (Aubrey, 1998, Brown & Miller, 1993; Daley, Salloun Suckofr, Kirisci, & Thase 1998).

In this review it was again found that BMIs have a consistent effect on treatment retention and adherence. For example in Brown and Miller’s, (1993) study, therapists in an inpatient unit who were blind to condition consistently rated clients who received BMI prior to entering treatment as more motivated, showing greater treatment adherence and having a better prognosis. When BMIs are used specifically to increase retention and adherence, Aubrey (1998) reported that adolescents increased two-fold the number of outpatient sessions they attended. While it is clear that BMIs are effective, the findings vary across studies, behavior domains, and therapists. What continues to be inclear is what are the factors that mediate and moderate the effects of MI (Hettema et al., 2005).
In a more recent meta-analytic review, BMIs were examined for equivalence to other interventions and also to see if they more effectively reduced alcohol consumption than when no treatment was provided (Vasilaki, Gosier & Cox, 2006). There were fifteen studies reviewed, with three studies examining the efficacy of MI among college students (Marlatt et al., 1998; Borsari & Carey, 2000; Murphy et al., 2001). Five studies were in outpatient clinical community settings (Handmaker et al., 1999; Kelly et al., 2000; Miller et al., 1988, 1993; Shakeshaft et al., 2002) and five studies in emergency room or other clinics settings (Healther et al., 1996; Genilello et al., 1999; Longabaugh et al., 2001; Smith et al., 2003). One study each in specialized substance abuse treatment (Bein et al., 1993a) and as a prelude to treatment (Brown & Miller, 1993). All the above studies found BMI to be efficacious in reducing alcohol consumption. When the dose of BMIs was examined and compared to no treatment it was found that ~ 87 minutes of BMI was more efficacious in reducing alcohol consumption with non dependent drinkers, ~ 53 minutes of BMI was more efficacious than a combination of other active treatments. While BMIs effects have been found to fade after the first follow up ($d = .77$ at 0 to 1 month and by 12 months $d = .30$) with some studies it has also been found that with those studies where BMIs were a precursor to treatment the effect size did not fade and sometimes increased over time with an average effect size of $d = .60$ (Hettema et al., 2005).

Overall, the support for BMIs is still not as strong in other behavior domains as it is with substance use problems. With substance abuse interventions, the findings further show that the effectiveness may vary when used either as a prelude to more intensive treatment or as a stand-alone treatment. The widespread use of BMIs demonstrates the interest in attempting to generalize an intervention with populations that have been traditionally left to there own devices to change.
With college students who engage in risky drinking traditional educational programs have failed them. Interventions tried on campuses have not had a focus on measuring results, instead they have focused more on educating students about the effects of alcohol misuse, and those who are at risk have received the least amount of attention.

Summary and Reason for Study

The research literature is replete with studies of high-risk drinking in college, but there has been a paucity of empirical evidence in support of any one intervention that reliably reduces students’ high risk drinking. Consequently, there is much to be done to adequately address the needs of students who have come to the attention of campus authorities and have been mandated for substance-use related services. BMI interventions have shown significant initial promise to serve this role.

Students judicially referred because of a violation of campus alcohol policies and mandated for treatment are the very students who potentially will gain the most from an effective intervention. Therefore it behooves us to study interventions that have proven to be effective with those who lack the motivation to change. To date few studies have been conducted with college students using BMIs, and even fewer have involved mandated students (Fromme & Corbin, 2004).

Why BMI is better suited for Risky Drinkers

BMI is well-suited for high-risk college drinkers because it is an intervention that tackles three important issues: (1) mandated status, (2) developmental transition, and (3) quality of campus life.

Mandated programs. As mandated programs increase, so do the number of referrals. Therefore, more high-risk students than ever before participate in some form of
alcohol intervention, which underscores the need for evidence-based interventions to effectuate change in this population. BMI seems particularly well-suited because judicially referred students may be less motivated to change despite their first-hand experience with the negative consequences of excessive drinking. BMI specifically seeks to enhance the motivation of individuals who are intrinsically ambivalent about change.

Another advantage of BMI is that treatment is tailored to the needs of the individual student. Students’ personal experiences are addressed and they receive individualized, objective feedback on their drinking pattern, the consequences of their drinking, and their beliefs about alcohol. This feedback is presented in a non-judgmental way, which allows students to take a closer look at their drinking behavior without feeling a need to defend themselves.

*Developmental Transition.* Research has found that risky drinking behavior at a particular time may be the result of the confluence of multiple trajectories. It is therefore necessary to understand how drinking fits into the lives of college students and how they evaluate drinking as a personal choice. Interventions must provide information in a way that is respectful, palatable and helpful without being overbearing, paternalistic or patronizing. BMI is designed to accomplish this goal. Students who are mandated will likely not respond to programs that utilize scare tactics, lecturing, or that tell them that their behavior is not the norm. The BMI therapist is sensitive and recognizes that college is a time of transition – from being dependent to independent, and from childhood to adulthood. Therefore, the BMI therapist respects the student’s autonomy and supports the individual’s self-efficacy.
Quality of Campus Life and College Experience. Students who abuse alcohol disproportionately affect the quality of life on campus. Their drinking and its resultant adverse effects are not limited to themselves but adversely affect those around them. Therefore, there is an increased demand to identify and treat those who are drinking excessively. The demand comes from the community within the university, but now also involves parents who have a right to be informed of alcohol violations both for those who are considered legally of age to drink and those who are considered legally minors. The right to notify is at the discretion of the university and more often occurs when multiply violations or incidents have occurred. This ability of campus authorities to inform parents is an unprecedented change that ultimately can influence how services for students are offered within the University setting. Therefore, an intervention that is amenable to research and demonstrates that it effectuate changes not only in individual students but in the campus culture as a whole, would be of benefit to students, the university, and the parents.

Rationale and Hypotheses

The purpose of the present study is to conduct an intervention with students who are judicially referred and mandated into treatment for an alcohol or drug-related violation of university policies. The study will employ the evidenced-based BMI, BASICS, developed by Dimeff et al. (1999), which has been shown to be effective with college students, but to date only one study (Barnett et al., 2004) has researched this intervention with students who are mandated for services. Therefore, more research with this population is needed.

The effectiveness of individual BMI will be evaluated against a standard group-
based intervention utilized at a Northeastern university termed “Discussing Our Choices” (hereafter DOC). A no-treatment control group will also be included in which students will receive university imposed sanctions (e.g., sanction only) but not undergo treatment.

**Hypothesis One:** Both DOC and BMI will result in greater improvement relative to a no-treatment control group. This will be evident by a decrease in the frequency of drinking, in the quantity of alcohol use, and in problems related to drinking.

**Hypothesis Two:** Given its strong emphasis on increasing motivation, BMI will lead to greater improvements than DOC. Improvements will be measured in terms of

- Decrease in standard units of alcohol consumed per drinking occasion
- Decrease in number of drinking days
- Decrease in alcohol-related consequences (e.g., missing class, fights with friends)

**Hypothesis Three:** Compared to DOC and the control condition, participants in BMI will show a greater willingness to change measured post-treatment and during the 1-month and 3-month follow-up periods.
CHAPTER 2

For students who drink, a change is underfoot on college campuses with regard to the types of services offered and the expectation that their effectiveness be measurable and significant. Heavy drinking is not unique to the college experience but the quantity of alcohol consumed per occasion and the number of drinking occasions is high despite the long history of attention given to this problem (Fromme & Corbin, 2004). As a part of this change, the focus is now on programs that address and demonstrate decreases in the quantity, frequency and negative consequences of high-risk drinking practices. Drinking behavior in general and risky drinking in particular has demonstrated no significant changes over the past twenty years with Traditional interventions, but with the innovative and evidence-based brief motivational interventions (BMIs), grounded in the principles of Motivational Interviewing, shifts in frequency, quantity and the associated consequences have been demonstrated (Larimer & Cronce, 2002).

Interventions with College Student Drinkers

Review of Non-evidenced based Interventions (Traditional Programs)

Two comprehensive reviews from 1980 - 2000 have concluded that most programs addressing drinking behavior on college campuses across the nation have not been based in any theory and have had little to no empirical support (Moskowitz, 1989; Larimer & Cronce 2002). Maddock (1999) in a comprehensive meta-analysis of college prevention concluded that typical education and awareness-based programs produced on average small effects on behavior (d = .17). The three most common types of Traditional programs are knowledge-based, values clarification and normative information. The
various techniques imbedded in these types of programs continue to be the mainstay of preventative efforts for alcohol use on campuses across the United States (Zimelis, 1998).

Knowledge-Based programs focus on presenting information about the health risks of alcohol with an implicit assumption that education alone is enough to decrease alcohol consumption. While many studies have been published using this type of intervention only seven studies were found comparable (Darkes & Goldman, 1993; Flynn & Brown, 1991; Garvin et al. 1990; Kivlahan et al. 1990, Meier, 1988; Roush & DeBlassie, 1989; Schall et al. 1991). Many other studies have been done but are not able to be compared in any meaningful way due to serious methodological limitations. Many of the methodological flaws included small sample sizes due to attrition, lack of control group or a control group that was not comparable to the treatment group. Lack of particulars in both the method and results sections have also contributed to less meaningful conclusions.

Darkes and Goldman’s (1993) did a study with moderate to heavy drinking male college students and randomly assigned them to one of three conditions. One of the conditions was a traditional informational and this yielded increases in knowledge but did not translate into decreases in drinking behavior. The other treatment condition was an expectancy challenge and the third condition was an assessment only control group. The expectancy challenge examines how the behavioral effects of alcohol may be more due to expectation than the actual pharmacological effects of alcohol. Participants in this condition imbibe alcohol or placebo alcohol drinks on three different occasions and in two types of situations, either a social content situation or a sexually related content situation (described in more detail in a later section). The students were then asked to
identify who had imbibed alcohol, including themselves. This condition produced significant reductions in drinking when compared with the other two groups. Of particular note with this study was that both the expectancy challenge and the traditional informational groups had the more significant decreases in drinking with lighter drinkers. This finding is in keeping with social theory regarding individuals who are not fully committed and how they can show change with any intervention while those who are more committed to their views of drinking do not respond with information alone (Darkes & Goldman, 1993). This could be due to the fact that heavier drinkers may already have more experiences with alcohol and the associated negative consequences and they are more ingrained as part of their college experience. While the expectancy challenge shows some signs of promise, with light drinkers, it may be a difficult intervention to get approval for particularly with underage drinkers and also it has not yet been investigated with female moderate to heavy drinkers. Given social learning theory it is the underage drinkers, less entrenched in beliefs and experiences of college drinking who may be more amenable to change. This need to intervene effectively with high risk drinkers has not been adequately addressed and continues to need interventions that address the complex nature of this behavior.

Kivlahan et al. (1990) was the only one out of seven studies to find significant decreases in drinking for a more traditional educational approach. In this study participants (N = 36) were randomly assigned to one of the following three groups for an 8-week intervention: Alcohol Skills Training Group (ASTP), Alcohol Information group (AI) and an assessment only control group. The ASTP group provided skills training in blood alcohol estimation, limit-setting, and relapse prevention. The AI group was based
on a DWI (Drinking while Intoxicated) program for first time offenders and consisted of lectures and films that promoted a disease model of alcoholism with an emphasis on the dangers of drinking (i.e., dispelling myths, behavioral and bodily effects of alcohol, interaction effects of alcohol with other drugs, alcohol industry, alcoholism, alcoholism and the family, legal issues with alcohol, responsible decision-making with alcohol). The AI group decreased their weekly consumption from an average 19.4 drinks at pretreatment to an average of 13.0 drinks at post treatment. The ASTP was more significantly different from pretreatment to post treatment, with average weekly drinks reported at 14.8 pretreatment to a post treatment weekly average of 6.6 drinks. The control group showed a slight increase in drinking from pretreatment to posttreatment with 15.6 to 16.8 weekly drinks, respectively. Even with significant reductions there were continued reports of occasional heavy drinking. While ASTP demonstrates an effect in the direction of moderation in general it does not appear to decrease occasional heavy drinking episodes which may benefit from interventions that are tailored to address more specifically those heavy drinking episodes along with the more moderate drinking episodes. This study further demonstrates drinking behavior that is high risk is not necessarily consistent and does not respond to interventions the same way as the moderate drinking experiences.

In general, traditional information programs were more often found to not contribute to decreases in alcohol consumption and if significant decreases were found they were minimal and paled in comparison to other non-didactic interventions. Again, those who are moderate to heavy drinkers may be more entrenched in their perceptions of drinking. Therefore, the information provided may not speak to their experience with
alcohol or allow an opportunity for them to come up with concerns they may have about their own drinking. These programs appear to incorrectly assume that informing students about the necessary concerns is itself enough to instigate change. To date the research has not supported this assumption. Thus the need for a change in interventions that have demonstrated effectiveness is necessary and apparent.

*Values Clarification* programs focus on encouraging students to evaluate their goals or values and integrate this with responsible decisions about alcohol. There were five studies found (Barnett et al. 1996; Meacci, 1990; Sammon et al. 1991; Schroeder & Prentice, 1998; Thompson, 1996) that used this approach and only two studies (Sammon et al. 1991; Thompson, 1996) reported reductions in drinking rates and both were fraught with methodological limitations thus decreasing the strength of their findings. As mentioned previously sample size, attrition and limited information on methods used compromised the overall findings reported and limited the ability to compare studies.

Sammon et al. (1991) did find decreases in drinking in a study with two groups of dental students at different Universities. The treatment group was dental students on one campus and they received an *On Campus Talking about Alcohol* program (OCTAA) offered as part of an addictions course with alcohol information that included values clarification and risk reduction. The control group was dental students from another university and they went on about their daily activities as dental students. Of those who received the intervention, 44.8% reported decreases in consumption from > 4 at pretreatment to 0-3 drinks per occasion at post treatment. Given the findings, it may be that the groups targeted were not at risk for engaging in heavy drinking and it is unclear what if any differences were of note between the two campuses or the two dental
programs. Clearly, this study could not state that the intervention alone was the reason for
the reduction in consumption of alcohol. It is unclear from the study whether the samples
differed at the outset in the amount they drank. This means if they were already different
in their drinking then that could more readily explain the difference and not the
intervention. In addition, dental students per se are not an at-risk population and therefore
any findings with this population of students may not generalize to those who are already
known to be at-risk for alcohol misuse and abuse.

Thompson (1996) used an intervention referred to as DELTS (Delta Tau Delta
Fraternity) DELTS Talking About Alcohol (DTAA) which is an adaptation of On Campus
Talking about Alcohol (OCTA). The participants consisted of two groups not randomly
assigned, with an intervention condition and a no treatment control. Both groups
consisted of students in the Delta Tau Delta Fraternity (DELTS). The students who
received the intervention DELTS Talking about Alcohol reported a greater percentage of
lower-risk consumption than those in the control group.

However, in both studies (Sammon et al. 1991; Thompson, 1996) information
about the samples, the procedures and the ability to compare the intervention and the
control group were limited. Both studies created bias from the outset with the sample
selection and condition assignment. Furthermore, in the Thompson (1996) study the
method used did not provide adequate comparison data with one campus receiving the
intervention and the other serving as the control group. The rates of heavy drinking from
one campus to another can vary from 10% to 65%, causing significant intercampus
variability. Some of the reasons for this are due to regional differences, higher population
of male students, more students living on campus, higher fraternity and sorority
membership and greater proportion of white students (Presley, Meilman, & Leichliter, 2002).

The other three studies (Barnett et al., 1996; Meacci, 1990 Schroeder & Prentice, 1998) also provided minimal support for the efficacy of values clarification programs and the methods of recruitment and then retention compromised the sample size and the treatment and control group were incapable of being compared with other studies.

Norms clarification focuses on providing accurate normative information to students related to peer drinking rates and problems and it encourages modification of attitudes about peers and parents acceptability of alcohol consumption. There were two studies and the findings were inconsistent (Barnett et al., 1996; Schroeder & Prentice, 1998). Barnett et al. (1996) sought to examine whether changing peer norms was a more effective drinking reduction program for college students. Of the 1,426 students initially selected to participate there was considerable attrition with an ultimate sample of N = 317 who were randomly assigned to one of the four conditions. The four conditions included a peer norm education, values clarification, peer norm and values clarification, and a no treatment control condition. The data for each group was collected on three different occasions, which included mid-October, mid-November of the fall semester and late February of the spring semester. This study concluded that those provided peer norm information or a combination of peer norm information and values clarification showed the most significant changes in norms with no changes in consumption. The results were not conclusive and partially due to significant attrition across time, maintenance of standard intervention was problematic, and lack of control over other outside influences (Barnett et al., 1996). It appeared that changes in perception might not be enough to
change behavior. These changes in perception again may be more challenging with those high risk drinkers who have become more entrenched in their drinking ways.

Schroeder and Prentice (1998), in contrast, reported that participants who received a 1-hour peer-delivered normative reeducation program (similar to one used in Barnett et al., 1996) did report significant reductions in drinking compared with alternative values clarification program. In the second study, the use of freshman only could have contributed to finding reductions in drinking because at this time, their perceptions may be more amenable to changes and influence their behavior versus older students who are more ensconced in the culture and myths of college drinking. The discrepancies in the findings could also be due to each campus having different drinking norms and utilizing different normative messages and each study reported attrition difficulties, making comparison between groups and between studies limited.

Summary

Traditional programs are the most common approach used on college campuses yet there is little to no evidence to support its efficacy. Walters et al. (1997) found students do not perceive educationally based alcohol programs as a credible option for help with a drinking problem. This may be even more germane to students who are already at higher risk for heavy drinking or already engaging in heavy drinking practices. Continued use with these more commonly used programs does not appear to be an effective use of resources given that it has not yielded consistent decreases. If anything, the changes are showing a slight but growing increase particularly for females, whereas a more modest increase for males (Walters & Baer, 2006). Therefore, the need for effective interventions continues to become more and more imperative.
Cognitive-Behavioral Skills-based program

Cognitive Behavioral Skills-based programs are a preliminary attempt to expand college drinking prevention programs beyond the educational approaches. These types of program are multimodal and include training in general life skills (e.g., stress or time management and assertiveness skills) and specific alcohol-focused skills (e.g., expectancy challenge procedures, blood-alcohol discrimination training and self-monitoring).

Two studies that utilized general life skills training with college students were found and both showed some short-term benefits on drinking rates (Rohsenow, Smith & Johnson, 1985; Murphy, Pagano, & Marlatt, 1986). Rohsenow et al. (1985) randomly assigned 36 heavy drinkers to either a general stress management course or an assessment only group. At 2.5-month follow-up, participants in the stress management condition showed decreases in alcohol consumption, but the effects did not endure at 5.5 months. This approach may be effective for reducing drinking during times of stress but when students are not under stress their desire to drink may return.

Murphy et al. (1986) assigned 60 heavy drinking males to 8 weeks of exercise, meditation, or an assessment only control group. The researchers found that the exercise condition significantly reduced weekly alcohol consumption (from baseline to week 10 there was a 60% reduction) compared to the control group even though drinking was not the target behavior. These reductions were maintained at six weeks follow-up after cessation of active intervention. Participants in the meditation were less likely to be compliant with meditating, but those that did meditate did show reductions that were similar to the exercise group. An essential element in making the behavior change may not only be related to what behavior it is replaced with but more due to the fact that the
motivation to drink has diminished. This allows the behavior to then be replaced with an alternative behavior. This study may not be adequately assessing what facilitated the alteration in behavior.

Another six studies were found that employ the Specific Alcohol Skills Training (ASTP) and three of the studies evaluate the expectancy challenge, (Darkes & Goldman, 1993; Darkes & Goldman 1998; Jones Silvia, & Richman, 1995) and three studies evaluate the effects of self-monitoring (Cronin, 1996; Garvin, Alcorn, & Faulkner, 1990; Miller, 1999). The expectancy challenge, as discussed previously, examines how expectation influences the behavioral effects of alcohol more than the actual pharmacological effects. Of these studies, two out of the three demonstrate statistically significant effects at short-term follow-up (Darkes & Goldman, 1993, 1998); the third study (Jones Silvia, & Richman, 1995) showed a trend in support of the expectancy challenge.

The first study by Darkes and Goldman (1993) sought to provide research to support the correlational notion of alcohol expectancy as a mediator for drinking. It randomly assigned moderate to heavy drinkers to one of three conditions (expectancy challenge, traditional program, and assessment only control). In the expectancy challenge condition alcohol drinks and placebo drinks were provided for two of the three treatment sessions. Session one has the group participate in a game (Win, Lose or Draw) and they had to guess to find out a secret phrase. The second session shows slides of women in advertisements and the group then debates her attractiveness and comes to a consensual rating. After each of the sessions, the participants were asked to write down those who consumed alcohol and to include themselves. The traditional program condition utilized
program developed by NIAAA (National Center for Alcohol Education, 1977) and the control group was assessment only. The findings showed that the expectancy challenge condition showed a significant decrease in consumption in comparison to the other two conditions \( F(2,47) = 3.8, p < .05 \). While this is an important finding, it does not answer the question of whether a change in expectancy is necessary to increase the motivation to change behavior. This type of intervention may be limited due to only allowing those who are of legal age to imbibe and it requires a significant amount of resources to plan and implement such an intervention. In addition, this study used students from a psychology subject pool who are a self-select group that may be more amenable to having their expectancies challenged and believe the results than those who are not taking a psychology course.

Once more, Darkes and Goldman (1998) provide heavy drinking male students either alcohol or an alcohol placebo drink. All alcohol drinks were five ounces of Collin’s mix with one ounce of vodka and the non-alcohol drinks were one ounce of flat tonic. Vodka was smeared on all glass rims and all glass rims were adorned with a vodka soaked lemon wedge to provide a consistent olfactory cue for all participants. The consumption of these beverages took place in a social/sexual challenge or an affective/cognitive challenge. Over the course of 9 weeks, the two challenge conditions received an orientation meeting, three treatment sessions, a posttreatment assessment, a passive booster session and a follow-up assessment meeting. The control group met at the same time points. The social situations were conducted on three occasions and were 45 minutes long and then it followed with participants being asked to give their best guess of whom (including themselves) had alcohol or placebo. The decision had to be based on
the observed behavior. Half of all participants who were of legal age to drink were randomly selected to receive the alcohol drinks. In the social/sexual challenge, the group during the first session engaged in a game that included mildly sexually provocative material. The second session involved showing slides of women in advertisements and the group debated their attractiveness and came to a consensual rating. In the Affective/Cognitive arousal challenge each session began with experiential sessions and session one focused on the sedative effects and expectancies, session two focused on clear thinking, alertness and problem solving. For both conditions after each of the sessions all members privately wrote down who they thought consumed alcohol (including themselves). In the third session, the participants received information about intervention, group discussion with emphasis on applicability to their daily lives. At immediate posttreatment and again at 6-weeks, participants in all three conditions showed a decrease in drinking, but those in the expectancy conditions demonstrated the largest reductions.

Interestingly, in both studies, heavy drinkers were the ones to show the greatest change. It also further demonstrated that the more traditional knowledge based programs do not affect the heavy drinkers’ consumption rates. With heavy drinkers it is unclear whether it is necessary to change their expectancies in order for them to change their drinking behavior. This may be more costly and labor intensive than is necessary to effect change in a group that is in need of effective and efficient interventions.

Jones et al. (1995) attempted to investigate the effect of increasing the awareness of alcohol expectancies by providing relevant information and opportunities that encourages self-challenging of the expectancies. The classification of participants was
according to their level of drinking (light, moderate, and heavy) and then randomly assigned to one of three conditions: expectancy challenge; expectancy challenge with a self-challenge or inoculation; and a no treatment control group. The expectancy challenge included education and discussion of alcohol expectancies and a self-monitoring of these expectancies. All conditions involved two intervention sessions. The group that had the expectancy challenge coupled with a self-challenge experienced the most improvement over time as measured at 24 days post treatment. The findings showed a trend in support of the expectancy challenge but the findings were not statistically significant.

The other three studies focused on self-monitoring and found changes in either consumption or negative consequences, or both (Cronin, 1996; Garvin, Alcorn, & Faulkner, 1990; Miller, 1999). Garvin, Alcorn, & Faulkner, (1990) studied a fraternity pledge class who were assigned to a self-monitor condition, alcohol education condition or a no-treatment control group. The self-monitoring condition trained to self-monitor and record their daily consumption of alcohol for a seven-week period. At 5-month follow-up, the alcohol consumption for the self-monitoring group was statistically lower than for the other two groups. Cronin (1996) compared student’s expectation of their drinking behavior and consequences one week prior to Spring Break and then asked one week after Spring Break to record their actual consumption and alcohol related problems. The students were asked to predict their consumption and possible consequences for each of the eight days of Spring Break. A control group was asked to assess their drinking after Spring Break. There was no difference found in consumption between groups but there was a difference between groups for alcohol problems. Those who predicted what consequences they would experience one week before were found to report experiencing
significantly lower frequency of alcohol related problems one week after Spring Break (Cronin 1996). Students who are heavier drinkers also may not be accurate in their recall of the consequences they experience or they may minimize the number of times it occurred due to the overall experience overshadowing the frequency and quantity of negative experiences.

In Miller’s (1999) study four groups were compared 547 students who varied in their risk for alcohol related problems were randomly assigned to one of four conditions. There were three treatment groups and a control group. All treatment groups received three computerized assessments during their freshman year, and two of these groups received additional interventions. One group received a two-session peer delivered ASTP in addition to the three computerized assessments. The other condition receives three assessments and a two-session peer facilitated interactive CD-ROM skills condition (Alcohol 101 CD-ROM, Reis et al. 2000). The control group received one assessment only. At 6-month follow-up, the treatment conditions were similar in that participants show less drinking and fewer problems than the single assessment only control group. Thus, the repeated assessment in the absence of any other feedback functioned as a form of intervention. Of note though is this study had an initial low response rate (25%) and the population was composed of a high percentage of abstainers (41%) and light drinkers (32%). This may indicate that abstainers and light drinker are more open to voluntarily engaging in interventions regarding alcohol use and benefit from learning about their own drinking in an interactive style. With such high percentage of abstainers and light drinkers, (73%) it is unclear if the high-risk drinkers would benefit from this intervention to the same degree. Especially since, high-risk drinkers have been found to experience
more consequences and to contribute to more consequences suffered by others (Hingson, 2002).

*Multicomponent alcohol skills training* is the most common of the cognitive behavioral approaches and seven studies were found that evaluated ten skills-based interventions (Armetrano, 1992; Baer et al, 1992; Garvin, et al, 1990; Jack, 1989; Kivlahan, et al. 1990; Marcello et al. 1989; Miller, 1999). Seven of the ten interventions found at least some effects on alcohol consumption or alcohol related problems. Garvin et al. (1990) conducted the study with a fraternity pledge class discussed earlier. It consisted of an alcohol education condition (moderate drinking skills, blood alcohol concentration discrimination and drink refusal), a trained self-monitoring condition and a no-treatment control group. The monitoring group recorded their daily consumption for 7 weeks and they reported lower alcohol consumption than the education condition or the no-treatment control group. Kivlahan, et al. (1990) conducted a study where 36 participants were randomly assigned to an ASTP condition, a didactic alcohol information condition, or assessment only control group. The ASTP condition was an 8-week multicomponent program including general life skills (e.g., relaxation, assertive drink refusal skills) and specific alcohol training skills (e.g., drink pacing, blood alcohol discrimination, and limit setting). All the groups maintained a daily drinking record. From baseline to posttreatment, the ASTP experienced a 38.5% decrease in number of drinks per week and the education condition experienced a decrease of 21.6% and 16% for the no-treatment control group. Despite these significant reductions in reported weekly drinks, it did not appear to affect the number of heavy drinking episodes. It appears to indicate that monitoring alone is not enough to effect change across all types of drinking experiences.
but it is not clear what components contribute to assisting in reducing number of drinks per week. Furthermore, this approach again may not effect enough change to make it worth the effort with those who consistently drink more heavily.

Baer et al. (1992) compared three forms of ASTP to evaluate whether intensity or format of the intervention would affect magnitude of change. The participants, volunteers, and self-identified heavy-drinkers, were randomly assigned to receive either an ASTP six-session condition, a single session with risk feedback and advice to change incorporated, or a condition that uses a self-help manual with ASTP content. At follow-up, all three conditions showed significant change in drinking rates and alcohol related problems but the self-help condition was eliminated due to high attrition. Miller (1999) conducted a study previously mentioned, with a 2-session peer-delivered ASTP, a 2-session computerized peer facilitated information/skills-training via Alcohol 101 CD-ROM (Reis et al. 2000), a repeat assessment only control group, and a single assessment control group. The two skills-based programs showed differences in their knowledge gained and their motivation to change. With light-moderate drinkers, it was found that the skills-based interventions yielded the significant reductions in negative consequences of drinking in comparison to the repeat assessment group. In addition, abstainers and heavy drinkers did not show any differences across all four conditions. Given that those students who drink heavy or abstain did not benefit it appears that this approach may appeal to those who have a behavior they have some motivation to change and not individuals who are less interested in changing or have nothing to change.

Summary
Upon review of the more traditional treatments, particularly cognitive and skills training approaches, they are consistently fraught with methodological problems and this diminishes the ability to make conclusive statements about the efficacy of these approaches. While there is some show of effectiveness, it is more often for those who are light to moderate drinkers. All studies tended to include students who demonstrated a range of drinking behaviors but the treatments did not appear to be equally effective for students no matter how much or how little they were drinking. In contrast to traditional cognitive-behavioral treatments, BMIs are an intervention that by design seeks to tailor the intervention to the individual drinking patterns and motivations to change. This intervention has been well described, assessment tools have been imbedded into the intervention, and there is a body of research with non-college populations that indicates it is an efficacious intervention.

**BMIs with the General College Population**

The use of BMI to effect change in college student drinking has garnered much attention over the last ten years. The efficacy of BMI with a college population has received some preliminary support, but little is known to date about its effects with college students who are the heaviest drinkers in the 18-24 year age range and are therefore at imminent risk for adverse consequences.

The research on BMI with college students has been growing slowly and currently comprises 13 published studies that have yielded a wide array of findings. In four studies, college students from the general college population volunteered to participate (Baer, et al. 1992, 2001; Borsari & Carey, 2000; Larimer et al. 2001; Marlatt et al. 1998). BMIs with a college-age sample in medical/mental health settings have yielded three studies
(Aubrey, 1998; Dimeff, 1997; Monti et al. 1999). There were also three studies found using mailed feedback (Agostinelli et al. 1995; Walters, et al. 1999, 2000). Populations known to be at risk for heavy drinking referred to as targeted populations (Greek letter members, freshmen, athletes, and mandated students) have the least amount of studies and the findings were generally less conclusive. To date there is no published research using BMI with athletes.

Four studies were conducted with college students who were recruited from the general college population (Baer, et al. 1992; Borsari & Carey, 2000; Larimer et al. 2000; Marlatt et al. 1998). Baer et al. (1992) published the first BMI study with college students. This study recruited 132 college students and randomly assigned them to one of three conditions: a one time 60- minute individual BMI session, 90-minute weekly sessions offered for six weeks with a cognitive-behavioral orientation class/discussion group, and a self-help six-unit manual with a cognitive-behavioral orientation (the latter control condition was later eliminated due to high attrition). At 6-weeks posttreatment, both intervention groups reported significant weekly reduction in alcohol consumption ranging 13.2 to 8.7 standard drinks, and a drop in monthly consumption from 49.9 to 41.1 drinks. The peak blood alcohol levels (BAL) were calculated and dropped from .15 to .10. At 3-month and 6-month follow-ups, the monthly alcohol consumption rates continued to decline significantly. Long-term follow-ups were conducted at 12 and 24 months and revealed a continuation in declines for monthly consumption. Enduring changes in weekly SEC and the weekly peak BAL were also observed. This study demonstrated that a 60-minute BMI session was as effective in reducing alcohol consumption as a more intensive 6-week group treatment, and that the effects did not
fade with time. Yet, these findings need to be interpreted with caution because this study did not include a control group.

Marlatt et al. (1998) published a 2-year follow-up study using a BMI with college students that examined alcohol use and lifestyle changes. In order to recruit students for the study a two-step process was used by first sample selection and the participant recruitment. From the sample selection students where further assessed if they were high risk and then randomly assigned to receive an individualized brief intervention or a no-treatment control condition. High-risk students were recruited and screened in their senior year of high school (188 females and 160 males). The high-risk group reported they consumed alcohol about twice a week, consumed about 11 drinks per week, the average weekly BAL was .12 and .18 for peak use, 72% reported from 0 to 3 conduct incidents related to alcohol use. The self-reported frequency, quantity and peak alcohol consumption at 6-month follow-up showed higher reductions in frequency, quantity, and peak quantity of alcohol consumption for the BMI group compared to the control condition. At two years post-treatment 70% of those in the MI group reported greater reductions in quantity, frequency, and peak quantity, and fewer alcohol-related problems (e.g., average of 3 problems for MI participants vs. 4.7 for controls). In addition, the MI participants were less likely to be classified as mildly alcohol dependent when compared to those in the control condition. Collaterals were used throughout the study to increase the reliability of self-report. Agreement between the participant’s self-report and the collateral ranged from .54 (frequency of intoxication) to .78 (typical drinking quantity per occasion) and was deemed reasonable. With regard to agreement for drinking related
problems, the reliability was lower (.46) and the possible unreliability of self-report of alcohol related problems was raised as a potential concern.

Borsari and Carey, (2000) replicated the Baer et al. (1992) and Marlatt et al. (1998) studies at a large Northeastern University. Sixty students from a psychology introductory course who reported drinking 5+ (male) and 4+ (female) consecutive drinks on two or more occasions in the previous month were recruited for the study. They were randomly assigned to a treatment condition with one BMI session fashioned after BASICS (Dimeff, 1999) or to a no-treatment control condition. The brief MI group reported significant decreases in the quantity and frequency of drinking and less episodes of heavy or “binge” drinking at 6-week follow-up when compared to the control group. Consequences experienced because of alcohol consumption did not show any reductions as measured by the Rutgers Alcohol Problems Inventory (White & Labouvie, 1989). Unfortunately, the conclusions drawn from this study are limited due to the lack of an active comparison condition. The inability to exclude nonspecific factors therefore limits the interpretation of the results concerning the effect the intervention had on the reduction in alcohol consumption.

Larimer et al. (2001) sought to replicate and extend the research done by Garvin et al. (1990) and Marlatt et al. (1998). The Larimer et al. (2001) study combined the approaches from these previous studies to examine if this would further enhance their efficacy. This study also sought to include only new fraternity pledges who were freshman because they have been the least studied and less exposed to the campus environment (Baer, 1993; Baer et al. 1992; Kivlahan et al. 1990). Twelve fraternities out of 21 were randomly selected after filling out prescreening forms and they were then
randomly divided to receive either the BMI (n = 6 houses, 77 participants) or treatment-as-usual (n = 6 houses, 82 participants) for a total of N = 159 participants. Those receiving the intervention were scheduled for an individual 1-hour session beyond baseline and given personalized feedback by either a trained peer administer or a professional. Each fraternity house in this condition also received a group 1-hour session to address the drinking norms and consequences within each house and 80% attendance was required. Participants in the treatment-as-usual where university police required at least 1-hour didactic presentation after baseline assessment and it involved some skills overlap with the intervention condition but no MI component. At 1-year follow-up participants (N = 120) were given the same assessment as the one received at baseline. This study found that the alcohol consumption with fraternity members decreased from 15.5 drinks to 12 drinks per week while the control group showed an increase in quantity per week from 14.5 drinks to 17 drinks. For the total average use a significant treatment effect was found with an effect size of $d = 0.42$. In addition, there was also a decrease in estimated peak BAL (from .12% to .08%) that produced a significant treatment effect with a corresponding effect size of $d = 0.38$ favoring the treatment intervention. Those who received the intervention from trained peer providers showed similar or larger reductions than professional feedback providers. This study provides the first of its kind to evaluate peer and professional feedback providers of alcohol prevention. While the findings were not significantly different, it did show that peers are at least as effective as professionals in providing this type of intervention. While the drinking behavior did change, the consequences did not decrease but were constant from baseline to follow up. This could be due to a variety of factors such as how the consequences were measured,
starting out with relatively low consequence rate, and consequences related to drinking no matter how high or low the drinking rates are may be an artifact of Greek life (Larimer et al. 2000; Turner et al. 2000). Overall, this study added much to the continued support for the utilization of BMIs with those who are deemed high-risk for heavy drinking practices.

One study was conducted with a college sample in a medical health (Dimeff, 1997) and two studies have been done with a similar age (college-age sample) in a medical/mental health setting (Aubrey, 1998; Monti et al. 1999). Dimeff (1997) conducted a computerized assessment of alcohol use and problems with college students seeking services in a college health center while in the waiting room. Students assessed as high-risk, based on frequency and quantity of drinks, were randomly assigned to receive an assessment only (n = 24) or a computerized personalized feedback reviewed with a primary care provider that highlighted alcohol related risks and provided risk reduction suggestions (n=17). The interpretations are limited due to a small sample size, but it is worth noting that the effects of the intervention revealed moderate to large effects with decreases in both drinking (d = .81) and alcohol related negative consequences (d = .54). While there findings shows promise that a computer-generated feedback in health care settings presented by a primary health care provider may be a viable intervention strategy, further study is needed.

Aubrey (1998) used a BMI with college age people presenting for outpatient substance abuse treatment. Some of these participants could have been college students so this is why it is worth including here. After an intake assessment was done, 77 adolescents (14-20 years old, mean of 17) were randomly assigned to standard care (n =
39) or two brief motivational feedback sessions utilizing the assessment results (n = 38). At 3-month follow-up those who received the intervention compared with those receiving standard care reported a greater percentage of days abstinent (70% versus 43%) and increased treatment attendance (17 versus 6 sessions attended).

College-age people presenting for treatment in an emergency room due to an alcohol related incident (motor vehicle accident, assault, or fall) were recruited to participate in an alcohol study comparing a BMI to standard care and seeking to reduce alcohol use and the associated negative consequences (Monti et al. 1999). Ninety-four young people ages 18-19 who presented at the emergency room were randomly assigned to receive BMI or standard care while in the emergency care facility. BMI consisted of a 40-minute session based on MI principles (Miller & Rollnick, 1995) and standard care included a handout on avoiding drinking and driving with a list of treatment agencies. At the 3-month follow-up, those in the intervention condition compared with the standard care condition showed significant reductions in the incidence of drinking and driving (62% vs. 85%), traffic violations (3% vs. 23%), injuries and other alcohol-related problems (21% vs. 50%). Both conditions showed significant reductions in alcohol consumption with no between group differences. This study suggests that BMI has the flexibility to provide a brief and personalized intervention in close proximity to when an individual drinks at a high-risk level and suffers an extreme consequence. The results of the study further suggest that BMI reduces the harmful effects associated with alcohol use beyond the effects of standard care.

Three studies have examined the effects of BMIs provided via mail (Agostinelli, Brown, & Miller, 1995; Walters, Bennett, & Miller, 1999, 2000). These studies suggest
that the efficacy of BMIs may depend more on the feedback component than the feedback combined with an interpersonal component. Agostinelli et al. (1995) wanted to examine how minimal a brief intervention could be and still show a change in behavior. This study sought to examine whether mailing normative information to heavy drinkers can effect change in their risky behavior. Five hundred and sixty eight college students were screened for heavy drinking behavior and sixty-four (11%) heavy drinkers (> 80 standard drinks per month) where identified and offered the opportunity to participate in a survey study about drinking of which fifty students agreed to participate. They were mailed a study packet and twenty-six students returned their information and this created the sample. All students accepted and returned detailed information about their drinking practices. Participants were randomly assigned to receive or not receive personalized feedback. The personalized feedback included a summary of scores and interpretive material. The following scores were provided: weekly average number of standard drinks based on their past sixty day use, a percentile ranking of their drinking level based on gender and compared with the U.S. population norms, BAL estimates, and score for their level of personal risk of alcohol related problems (this score was based on their tolerance and family history). The interpretive material (three pages) was included to assist in understanding the feedback provided.

At 6-week follow-up, those mailed a personalized feedback reported a reduction from baseline of 16.4 to 8.5, \(d = .90\) and those who did not receive a personalized feedback summary did not report significant reductions from baseline (10.6 to 10.1 \(d = .04\)). On consumption measures with the feedback group the reported effect size (.68) is higher than effect sizes reported in a meta-analysis for brief intervention groups (.36 and
.53) (Bien et al. 1993) and similar to other studies that mailed feedback in the general population with effect sizes of .53 (Heather, Whitton & Roberts, 1986) and .65 (Heather, Kissoon-Singh, and Fenton 1990). Of note in this study was that the original cut off for participation was eighty drinks per month (weekly average of 20+ drinks) and after more detailed examination of the reported drinking, the sample was found to have a weekly average consumption of 13.7 drinks per week on average. Therefore, this group was less high risk than originally suggested. These participants may have been less severe and therefore more amenable to shifts with just the personalized feedback and this has been suggested previously. Those who are more severe may benefit from a meeting where this feedback is addressed and questions and reactions are reacted to in a more MI manner. Therefore, there may some restrictions in assuming this would be equally effective for those who drink >20 drinks per week. Further study on individual and interaction effects of both normative data and risk behaviors as affecting change are also warranted.

Walters, Bennett and Miller, 2000 and Walters, 2000 both used students who were self-identified as moderate to heavy drinking through a psychology mass testing pool. They completed measures of quantity/frequency, drinking consequences, and attitude questionnaires and were then randomized to one of three groups consisting of those who receive a mailed personalize feedback only, a mailed personal feedback plus a 2-hour information group (promote responsible drinking through educational, attitudinal, and skills-based approaches) or a no-treatment control condition. All participants assigned to receive the personalized feedback received information about both frequency and quantity of their use, peak weekly and monthly BAL and other personal risk factors. In each study the feedback alone condition was significantly more effective than the
condition where feedback was combined with a 2-hour information group. In Walters et al. (2000) there were 37 participants randomly assigned to the previously described three conditions (65% of this group reported > 40 drinks in the previous month). At 6-week follow-up, the feedback only participants showed a reduction of nearly 14 drinks per week as compared with 6 drinks per week among the combined intervention condition and 1 drink in control group. The second study done by Walters (2000) was due to the initial success of the mailed feedback. This study was then replicated at another university where students were recruited similarly (60% of this sample reported drinking >40 drinks in the previous month) and forty participants were randomly assigned to three groups with an alteration made in the group/classroom condition to include a presentation and discussion of the personal feedback and not to mail it. Participants were assigned to a 2-hour session with the personal feedback on drinking integrated in with information, a mailed feedback only condition and a no treatment control. Thirty-four participated in 6-week follow-up and again it found the feedback only group reduced their alcohol consumption by 6.6 drinks per week (ES = .63), the combined intervention showed a weekly reduction of .35 drinks (ES = .03) and the control group reduced drinks by 2.75 (ES =.29). The design of this personalized feedback drew from a number of resources such as the Drinker’s Check-up. It also included estimates of alcohol consumption, BAL and tolerance (based on self-reported use over the past month), alcohol related consequences and risks, cost of alcohol per year and the percentage of income it corresponds to individually, the percentage of students who drank more than themselves, not at all or have less than two drinks per week. It also included some information about
smoking. This was all embedded within four pages and with explanations, advice, dispelling of drinking myths.

These studies do show promise for this form of BMI but they do have a few limitations worth mentioning such as small sample sizes, short-term follow-up assessments, and limited sampled information, which can compromise the ability to generalize and compare these studies. In addition, students who drink more than forty drinks on a given month were not represented in this sample, which may be considered the heavy drinking and high-risk drinkers and may be why this form of BMI was effective. The light to moderate drinkers may require less rolling with the resistance and may already be at the tipping point from precontemplation to contemplation than would be the heavier drinkers. Given they were volunteers and possibly moderated drinkers the results cannot be assumed to be effective with mandated populations and those who are heavy/high risk drinkers and in fact this group may require more face to face to roll with the resistance. This type of option may be feasible for students who volunteer to participate and are moderate drinkers with fewer consequences but may not be an appropriate enough consequence for students who violate drinking policies on campus. Given that BMIs are showing changes in drinking behavior in various forms of providing the intervention (e.g., face to face, mailings) this raises a new issue of how and when to use which form of the intervention and with which population. With mandated students, the ability to monitor a time commitment may be necessary given the circumstances of the referral. So how best to decide which form of a BMI suits which population is an important issue to address.
Summary

Most of the studies discussed above have provided support for the efficacy of BMIs whether they are delivered in a small group format alone or in combination with risk skills-training information. In addition, whether it should be delivered face to face or delivered to the student via mail. Out of all the studies conducted to date, 5 studies provide in-person BMIs (Baer et al. 1992, 2001; Borsari & Carey, 2000; Larimer et al. 2001; Murphy et al. 2001). These studies provide clear support for BMI’s efficacy in reducing drinking, and to a lesser extent in decreasing alcohol-related problem. However, there has yet to be a study that compares BMI with an active control group and with a similar number of sessions. Studies that mailed the feedback showed significant changes, but there were limitations with the samples as discussed above. To date, the research with BMIs has been with student volunteers as was done in the previous twenty years but the research with BMIs has been methodologically superior because of the use of randomization, standardization in assessment outcomes, manualized or well-described interventions, and they typically have relatively lower rates of attrition. Clearly continued evaluation of BMI with high-risk college students, especially mandated college students, is warranted.

BMIs with Targeted High Risk Populations

While college campuses have consistently identified certain student groups as being at risk for heavy drinking practices the more traditional interventions used to date are not sufficient to meet the needs of a high-risk population. The three groups that have been traditionally associated with high-risk drinking behavior are Greek organizations, athletes, and freshmen (Canterbury et al. 1992; Deilman, 1990; Kein, 1989; Meilman et
al, 1990; Pope et al, 1990). More recently with the rise of mandated programs on college campuses for violation of alcohol and drug policies, those who are mandated for services are also deemed a high-risk target population.

Several studies exist targeting alcohol use with these high-risk groups and four studies have been found specifically targeting members of Greek organizations (Garvin et al. 1990; Larimer et al. 2001; Marlatt et al. 1998; Thompson, 1996); one prevention outcome study specifically targets athletes (Marcello, et al 1989); four studies address freshmen alcohol use behavior (Marlatt et al. 1998; Schroeder & Prentice, 1998; Miller 1999; Larimer et al. 2001; Fromme & Corbin, 2004) and three studies have been done with students mandated for services (Barnett, et al. 2004; Borsari & Carey, 2004; LaBrie, Lamb, Pedersen, & Quinlan, 2006).

There have been four studies done to date with Greek populations and within these studies there have been five types of approaches evaluated. Two approaches of BMI with feedback have been evaluated in Larimer et al. (2002) and Marlett et al. (1998), two approaches of skills training (monitoring alcohol intake and behavioral skills training) in Garvin et al. (1990) and one approach studied involved a combination of information, values clarification and risk reduction (Dels Talking about Alcohol; Thompson, 1996). These studies have been discussed previously in more detail. Of these four studies, only Marlatt et al. (1998) used a true experimental design with individual randomization and the only study to include sufficient representation of a female sorority population. The other studies mentioned had several methodological limitations including lack of randomization, small sample size and low efficacy in that change in level of drinking and negative consequences remained in the high-risk range even after decreases. Therefore,
there is no conclusive support for any one intervention as being most efficacious with fraternities and sororities. With *athletes*, the one study conducted to date did not use a BMI and did not find any significant results for multicomponent skill training intervention (Marcello et al. 1989). In general, the literature is replete with descriptive studies of athlete’s drinking behavior and evaluation of training programs for athletes, but BMI studies targeting athletes to date are absent.

*Freshmen* have evidenced positive responses to BMI interventions. Four studies using a variety of approaches revealed decreases in the use of alcohol and the attendant negative consequences. The approaches used varied from BMI (Larimer et al. 2001; Marlatt et al. 1998) skill training (Miller, 1999), and peer-based normative reeducation (Schroeder & Prentice, 1998). Also of note is that freshmen, while at increased risk for heavy alcohol use and concomitant negative consequences, also appear to be amenable to preventative interventions (Pope et al. 1990).

*Mandated Students* are increasingly being referred to substance abuse interventions (Stone & Lucas, 1994). To date three studies have used a form of BMI with judicially referred students (Barnett, Colby and Monti, 2004; Borsari & Carey, 2004; Fromme & Corbin, 2004; LaBrie, Lamb, Pedersen and Quinlan, 2006). Due to their mandated status this sub-population of drinkers are assumed to pose some unique challenges given they are disproportionately higher risk drinkers (Caldwell, 2002), treatment outcome are assumed to be worse (Hohman, Shilington, & Baxter 2003) and some questions have been raised as to whether harms reduction is appropriate as a goal with this population (Wild, 1999). With regard to college students, little is known about how or if mandated students differ from their non-mandated counterparts. It does appear
that those referred or mandated for treatment in general do show signs of promise when motivation and readiness to change (motivationally enhanced treatments MET) are part of treatment as indicated by improvements in treatment participation, retention rates and completion rates (Lincourt, Kuettel & Bombardier, 2002; Sia, Dansereaau, & Czuchry, 2000).

Borsari and Carey (2004) used a randomized control group design to evaluate the effectiveness of individual BMI ($n = 34$) compared with an individual Alcohol Education (AE) ($n = 30$) program with a waitlist control group for mandated students and information only for volunteers. Students were recruited from two different college campuses. Students who violated campus alcohol policies and resulted in a referral for further services were screened for eligibility. Brian Borsari administered both interventions in a face-to-face format. As done in previous research the BMI utilized baseline information to create a personalized feedback (Dimeff, Baer, Kivlahan, & Marlatt, 1999). This individual information was the bases for introducing norms information, BAL and tolerance, alcohol related problems, influence of setting and expectancies on drinking and alcohol expectancies and these expectancies were related to their personal experiences. Harms reduction strategies were also introduced as a way to minimize potential harm or negative consequences associated with drinking alcohol. As in keeping with BMI the materials were presented adhering to four principles of MI (express empathy, develop discrepancy, and roll with resistance, support self-efficacy (Miller & Rollnick, 2002). The AE presented information in a similar fashion to what is typical of alcohol education groups on campuses with information about alcohol and its effects without integrating any personal information. Overall, there was a trend ($p = .088$)
for both groups with reductions in high risk drinking. At 3-months the BMI group reported fewer alcohol related problems ($d = .90$) with an overall 49% reduction in problems for BMI students versus a 4% reduction for AE students. The BMI intervention included a harms reduction approach that was not included in the AE and this may account for the change in alcohol related problems for this group. Differences between mandated and voluntary groups yielded no significant finding which is counter to what has been assumed about mandated individuals. Further studies with this population are necessary to support that BMI is an intervention that is as effective for those who are voluntary as those who are mandated. It is unclear from this study whether there was something about combining both heavy drinking voluntary male students and heavy drinking mandated male students that enhanced this intervention or whether the status of the referral does not matter when using a BMI.

Barnett, Colby and Monti (2004) offered students who had an alcohol related medical or disciplinary event occur the option to participate in a study of two interventions. Sixty-five percent of the students asked agreed to participate and after initial assessment were randomly assigned to either BMI or Standard Education (SE) and either a 1-month a booster session or not. The BMI was a 45-minute session that provided students with the opportunity to talk about the reasons for the referral, to evaluate their own use of alcohol, and the alcohol use of others. As part of this intervention, participants received a feedback summary (normative data, BAL levels over past month, specific risks). A harm reduction focus was maintained with emphasis on the consequences rather than on their drinking. The SE condition was also 45-minutes and consisted of a computerize alcohol program where education about gender differences in the
metabolism of alcohol, drinking and driving, sexual decisions, and drinking games were presented. The study included 117 participants who completed a 3-month follow-up. This study continues to follow participants and new findings are yet to be published. In a repeated measures analyses at 3-month follow-up both intervention groups showed significant reductions in the frequency of drinking, number of heavy drinking days in the past month, lower number of drinks per week but no between group differences were detected. The SE group had significantly lower BAL than the BMI condition. There were no differences found in the number of alcohol related consequences at this time. This Given that this group experiences more personal consequences and contributes to more consequences they may continue to experience the fall out of their drinking even after they have reduced their drinking and require more time to measure the changes in their consequences than reduction in their drinking. Students may need more time to repair the damages done and may need further assistance either through booster sessions or further counseling to assist in dealing with the problems they experienced as a result of their high-risk drinking practices. This group in particular may also benefit from having some form of intervention that checks in with them periodically and assists them in seeing how they are managing and dealing with their consequences. This could punctuate the students decreases in both drinking and alcohol related consequences while highlighting academic and social achievements no longer compromised by alcohol use behavior.

Fromme and Corbin (2004) combined both motivational enhancement and cognitive-behavioral skills training to create a Lifestyle Management Class (LMC). This consisted of two 2-hour classes with a focus on increasing knowledge about alcohol (drinking patterns and consequences), correct misperceptions about peer drinking norms,
increase motivation for healthy lifestyle changes (including reductions in alcohol consumption) and increase behavioral skills (self-management, alcohol use, time and stress management). The LMC classes were peer and professionally led, had both voluntary and mandated students. This study also sought to evaluate this intervention as a universal and targeted program. Two sources were needed to recruit volunteers and those mandated and they were all randomly assigned to a peer led LMC or a professionally led LMC. For those who were volunteers the control group was information only and the mandated group had a control group that was waitlisted. The volunteers were recruited through campus-wide recruitment (N = 452) and the mandated students were referred to the course due to a violation of a campus drinking policy and needed to complete the course in order to register for the next semester (N= 124). Both groups of participants were intermingled in each class and neither the students nor the facilitators were aware who was mandated and who was a volunteer. Prior to the intervention there were notable differences in the samples with the mandated group consisting of younger students, mostly male and predominantly white. This same group also reported more drinks per week and more consequences related to intoxication. Overall, the changes in heavy drinking appeared varied due to gender, readiness to change (RTC) and treatment condition. Larger decreases in heavy drinking showed a significant effect for those with higher RTC and the voluntary LMC group, whether it was peer or professionally led. In the mandated sample the trend for greater decreases in heavy drinking practices was higher for men in the treatment condition. Significant decreases in drinking and driving were also found. Overall, this study found that use of this LMC program for both universal (voluntary) and targeted (mandated) was effective
and that RTC moderated theses decreases. Changes in drinking behavior may show gender bias due to how we measure change for males and females and may be less precise when drink for drink it is a different effect on BAL for males than females. Males in general may need to decrease more drinks to effect BAL whereas a shift in BAL for females respond with smaller decreases in drinks. Male heavier drinkers may drink more drinks per time than females and so BAL may be a more equitable measure of changes in frequency and quantity.

In the LaBrie et al. (2006) study a BMI was provided in a one-session group format, with one and three-month follow-up assessments with 167 judicially referred students, (60% male and 40% female). At the outset of the intervention all students completed an assessment of their drinking including frequency and quantity for past month and upcoming month, alcohol related consequences experienced, motivation to change their behavior and a 3-month Timeline Followback assessment. The intervention incorporated the Timeline Followback assessments, decisional balance of change in drinking behavior, relapse prevention, expectancy challenges, and development of individual behavioral goals related to their drinking practices. In addition, all participants kept monthly drinking diaries for three months post the intervention. For the purposes of analysis the participants were divided into three drinking groups based on number of binge episodes (5 + for males; 4+ for females) prior to the intervention with non-binge drinkers (17%, \( n = 29 \)), binge drinkers (31%, \( n = 51 \)) and frequent binge drinkers (52 %, \( n = 87 \)). The overall findings with this study indicated that it was effective in reducing alcohol associated consequences, levels of drinking and judicial recidivism. Males were found to be the heaviest drinkers from the outset of the study and to report the more
significant decreases across time (96 drinks per month to 47 drinks per month for males). Males in this study also reduced their maximum number of drinks per time significantly from 15.4 drinks per time to 8.7 drinks per time. In addition, it was found that those who were frequent binge drinkers had more significant decreases over time for a total reduction of approximately 60 drinks per month (~ 113 drinks per month at baseline to ~ 53 drinks per month at 3-months) and decreases in their maximum drinks per any one time by 3 drinks (12 drinks to 9 drinks).

Conclusion and closing remarks

From this review, it is apparent that BMI has the potential to effect changes in drinking that promote reduction in frequency, quantity and consequences associated with drinking. Preliminary support with college students has emerged and provides hope for the treatment of students who engage in heavy drinking. Those deemed to have the highest propensity for risky drinking behavior and alcohol related consequences appear to be the least studied. Given this priority and urgency to attend to these high-risk populations, further research with BMI is necessary to understand how to effect change with this population that appears to drink more, suffer more consequences and to also possibly be less motivated to change their behavior. Traditional programs have historically addressed students as a homogenous group. In working with targeted populations such as mandated students it is imperative not to repeat this same mistake. Therefore, it behooves us to understand more fully the benefits of BMI and not to prematurely generalize preliminary positive findings before gathering enough evidence. Therefore this study seeks to provide further understanding of BMI with mandated students by offering and individual BMI and comparing it to a treatment as usual (multicomponent) group intervention.
CHAPTER 3

Method

Participants

One hundred fifty students (47 females and 103 males) from a Northeastern State University were referred by the Office of Conflict Resolution and Civic Responsibility for violating campus drinking policies. The students ranged in age from 18 to 22 years. Most were freshman (49%), followed by sophomores (35%), juniors (12%), and seniors (3%). Their average GPA was 3.0 ($SD = .90$). Their ethnic/racial background was 77.3% Caucasian, 6% African American, 6.7% Hispanic, 5.3% Asian and 4.7% “other” (Table 1).

Measures

The measures quantified students’ alcohol use, alcohol-related consequences, and their motivation to make changes to their drinking behavior. Several alcohol use measures required participants to quantify the number of alcoholic beverages they imbibed, and the following standard measurements were used throughout the study: One standard drink was considered to be the equivalent of 12 ounces of beer, or 4 ounces of wine, or 1½ ounces of 80-proof spirits. Unless otherwise indicated, all measures were administered at pre-treatment, post-treatment, one-month follow-up, and three-month follow-up.

Measures of Alcohol Use

Daily Drinking Questionnaire – (DDQ). The modified DDQ, (Collins, Parks, & Marlatt, 1985) measures the weekly average frequency (how many days per week) and quantity (how many drinks per day) of alcohol use in the past month. The DDQ is a shortened version of the Drinking Practice Questionnaire (DPQ; Cahalan, Cisin &
Crossley, 1969) that was developed to measure the frequency, quantity and volume of alcohol consumption. The convergent validity of the DDQ with the DPQ is very good (r = .50, p < .001; Collins, et al., 1985.) The DDQ is a measure that is sensitive to changes in drinking.

Frequency-Quantity Questionnaire (FQQ). The FQQ (Dimeff, Baer, Kivlahan, & Marlatt, 1999) was adapted from a measure developed by Cahalan and Cisin, (1968) and serves as a quick assessment of a person’s drinking habits. The FQQ is comprised of three multiple-choice questions. The first asks respondents to indicate on an 11-point scale (from 1 = no drinks to 11 = 19 or more drinks) the maximum quantity of alcohol consumed on a single occasion during the past month. The second question asks about, the typical quantity consumed on a weekend (from 1 = no drinks to 11 = 19 or more drinks). The third question assesses the frequency of drinking over the past month on a six-point scale (from 1 = do not drink at all to 6 = once a day or more). Neal and Carey (2005) found the intercorrelations among the questions to range from r = .68 to .89 with an internal consistency of r = .89.

Measures of Perceived Consequences related to Alcohol Use

Rutgers Alcohol Problem Index (RAPI). The RAPI (White & Labouvie, 1989) measures negative consequences experienced as a result of alcohol consumption. The RAPI is a self-report measure with 23-items where participants specify how many times they experience each problem over a specific time period. Responses were initially scored on a 5-point scale ranging from 0 (never) to 4 (more than 10 times). The RAPI has been shown to be a valid measure of alcohol-related negative consequences and has been used extensively with college students (e.g. Martens, Neighbors, Dams-O’Connor, Lee,
Exploratory and confirmatory factor analysis were done and identified three distinct subscales on the measure, which they labeled Abuse/Dependence (12 items), Individual Consequences (7 items), and Social Consequences (4 items). The subscales accounted for 24%–76% of the variance in the individual items, with a mean variance accounted for of 53%. In the current study, these subscales were modeled as manifest indicators of a latent Alcohol-Related Negative Consequences variable. The internal consistency of the three subscales was .75, .81, and .83 for Social Consequences, Individual Consequences, and Abuse/Dependence, respectively. The mean score on the measure was 3.48 (4.23 median = 2.00).

Measure of Motivation to Change

Readiness Ruler (RR). The RR (Rollnick, Heather, Gold & Hall, 1992) is a 12-item self-administered questionnaire that is based on Prochaska and DiClemente’s (1984) stages-of-change model. For the purposes of the present study only the alcohol use item was employed. Participants were instructed to indicate their level of readiness to make changes in their drinking habit on a 10-point scale: 1 to 2 (not ready to change), 3 to 4 (unsure), 5 to 7 (ready to change), and 8 to 10 (trying to change). These ranges correspond in Prochaska and DiClemente’s change model to the stages of pre-contemplation, contemplation, preparation, and action. This RR is a useful measure to monitor whether and how motivation changes as treatment progresses. The RR has good concurrent validity with the Readiness to Change Questionnaire (RCQ), with Spearman’s rho between the RR and the RCQ dimensional score being 0.47 (Rollnick, Heather, Gold & Hall, 1992).
**Procedure**

Students from the participating campus who violate the campus alcohol use policy are referred to the Conflict Resolution and Civic Responsibility Office (CRCRO) and mandated to receive an alcohol intervention. Over six consecutive semesters, CRCRO staff offered students the option to participate in a research study and those who agreed were referred to the study personnel. Students who did not wish to participate in the study were mandated to follow through with treatment as usual. Given that the information asked of the participants was sensitive in nature, for students who enrolled in the research project, protection was provided by obtaining a federal Certificate of Confidentiality from the National Institute of Mental Health.

The students who agreed to enter the study were randomly assigned to one of three interventions. The first condition was an individual Brief Motivational Intervention (“BMI”) and consisted of two sessions of individual face-to-face counseling modeled after the “Brief Alcohol Screening and Intervention for College Students” (BASICS) by Dimeff et al. (1999). The second condition was the University’s treatment as usual and consisted of a group intervention called “Discussing Our Choices” (DOC) that involved using values clarification. The third condition was a no-treatment control group (hereafter “control”).

All participants were required to sign informed consent. After completing the pre-assessment questionnaires (alcohol use measures, drinking consequences, and motivation to change measure) presented in counter-balanced order, students were randomly assigned to one of the three above conditions. Students in DOC were oversampled based on communication from CRCRO that students in this intervention frequently are lost to
the second assessment. The assignment yielded 40 students in BMI, 68 in DOC, and 42 in the Control Group. Students randomized to BMI attended their initial treatment session immediately following completion of the pre-assessment questionnaires. The BMI intervention was implemented by one of three doctoral students who served as individual therapists for this condition. The second BMI intervention session was then scheduled within 7-10 days from the initial meeting and was conducted by the same therapist.

DOC participants were scheduled for their first and second group meetings according to dates preset by the university. Since the DOC treatment was the university’s so-called “treatment as usual”, the group meetings included both students who participated in the research study and those who opted not to participate. Initial sessions were offered at multiple times throughout the semester and were conducted as smaller group meetings with 8-20 students. Research participants were registered for the next available time for their initial meeting. The second group session occurred for all DOC participants on Reading Day at the end of a semester. This second meeting included all students who had come before CRCRO for an alcohol-related violation during that semester (approximately 250-300 students) and was also comprised of both research participants and non-participants. The DOC intervention was implemented by University Counseling Center psychology interns and the first and second sessions were not necessarily conducted by the same group facilitators.

Participants in the control group completed the initial set of questionnaires that served as pre-assessment. They were then scheduled for a second assessment within 7-10 days of their initial meeting, in keeping with the post-test for the BMI condition.
Participants in all three conditions were rescheduled for 1-month and 3-month follow-up assessments following the post-assessment.

**Treatment Protocols**

**BMI Condition:** The initial therapy session lasted 50-60 minutes. As part of the initial meeting, the therapist asked for a verbal commitment from the participant for active participation. The therapist adhered to the principles of *motivational interviewing* (i.e., the initial meeting entailed engaging the client in a non-confrontational manner in treatment while information was being gathered). The session was conducted using a structured interview format modeled after BASICS (Dimeff et al., 1999) that was created for the purpose of this study (see Appendix A). The therapist obtained information regarding the participants’ current and past drinking experiences, including the circumstances that led to the violation of the University regulations, history of any other significant alcohol related consequences or prior treatment, and the individual’s family history of substance use and mental health. Participants were also asked to provide information about their academic major, career plans, non-alcohol related activities they engage in regularly for relaxation and stress reduction, as well as spiritual or religious beliefs and practices. All information gathered during this initial assessment was later integrated into a personalized feedback summary that the therapist reviewed with the participant in the second session.

Participants received reminder calls one or two days prior to their second appointment. The second BMI session lasted again 40-60 minutes. Participants were provided a copy of their personalized feedback summary and the therapist reviewed the information with the participant (for an example, see Appendix B). Participants were
encouraged to react, add information, and ask questions as the details of their personalized summary were discussed. During this session, the therapist again adhered to the principles of motivational interviewing: focusing on meeting participants at the stage of change they presented, interacting with and presenting information in a nonconfrontational manner, and rolling with any resistance to the information discussed.

At the end of the meeting, participants received a copy of their personalized feedback summary. They also were given two “tips and facts” sheets to take home with risk reduction strategies, facts about the effects of alcohol use, and the effects of alcohol on sleeping patterns (see Appendix C). Then participants completed the post-assessment questionnaires and were scheduled for the follow up assessments.

For both the one-month and the three-month follow-up meetings, participants received a reminder call and an e-mail. If possible, participants completed the follow-up assessments in the lab. However, as some of the assessments occurred during semester breaks, some participants were mailed their follow-up questionnaire packets in an unmarked envelope with an accompanying letter (Appendix D) and a stamped and addressed return envelope.

**DOC Group**: The initial DOC meetings were typically offered once or twice a week throughout the semester. Study participants randomized to DOC were assigned to the next available meeting and received a reminder call one or two days before the meeting. The initial DOC workshop lasted approximately 60-90 minutes and was conducted by two group facilitators (doctoral students) for the approximately 8-20 participants who attended these meetings and who were comprised of both research participants and nonparticipants. The initial workshop began with students providing a
brief summary of the reasons for their referral, which the facilitators then summarized. Next, students were asked to break into smaller groups (3-4 students) and to rank-order as a group the top five values from a larger listing of values (e.g., trust, family, respect). The rankings were identified by consensus and shared with the larger group and discussed. During the discussion psycho educational information was provided about the habits and values associated with drinking behavior, college drinking norms, and drinking myths.

The second meeting in the DOC program was offered only once at the end of a semester during Reading Day. This meeting was attended on average by 250 to 300 students comprised of both research participants and nonparticipants. A short video was shown with individual college students discussing their experience. Participants were then encouraged to comment, question and react to the video content. Two facilitators encouraged dialogue, reflected back to the audience what was being said and interjected questions or observations about how students responded collectively and individually. Immediately following the DOC workshop, research participants met in an adjacent room to complete the post-assessment questionnaires. Participants who were local were scheduled for the one-month follow-up assessment on campus and received a reminder call before the appointment. Those who left the area for the break received the follow-up assessments by mail.

_No-Treatment Control:_ The participants in this condition followed a schedule equivalent to that of the BMI condition. After the initial assessment meeting, the participants were rescheduled for a second assessment meeting within 7-10 days and then again at 1-month and 3-month follow-up. Trained undergraduate research assistants
administered the questionnaires to these participants and set up their appointments. All participants who did not reside in the area for any of their assessments were mailed the questionnaires.

*Participant compensation*

For completing each follow-up assessment participants in all conditions received a gift certificate for a movie or a coffee shop valued at between $5 to $8.

*Study Hypotheses*

The following hypotheses were tested in this study.

*Hypothesis 1:*

Both BMI and DOC will result in greater improvement relative to a no-treatment control group, as evident by greater decreases in the frequency and quantity of alcohol use and in alcohol-related consequences.

*Hypothesis 2:*

Due to its strong emphasis on increasing motivation to change, BMI will lead to greater improvements than DOC, as evident by a greater reduction in the frequency and quantity of alcohol use and of alcohol-related consequences.

*Hypothesis 3:*

Participants in BMI will show the greatest willingness to change (RR), followed by participants in DOC, and followed by those in the no-treatment control group.
CHAPTER 4
Results

Preliminary Analyses

The distributions of the outcome variables were examined for normality and all showed adequate properties. Thus, no transformations were necessary. To rule out possible group differences in demographic characteristics or in the dependent variables prior to the experimental manipulations, preliminary analyses were conducted to examine the equivalency of the three intervention conditions at pretest.

Demographic variables and grade point average (GPA). The participants’ gender, age, race/ethnicity and their GPA is listed in Table 1. Chi square analyses showed no significant group differences in race/ethnicity [$\chi^2(8, N = 150) = 8.48, p = .39$] or gender [$\chi^2(2, N = 150) = 1.23, p = .54$]. One-way analyses of variance (ANOVA) showed no significant differences in age [$F(2, 147) = .31, p = .73$] or scholastic achievement as measured via GPA [$F(2, 147) = .78, p = .46$].

Baseline drinking behavior and consequences. The three groups were also compared on baseline alcohol consumption variables, readiness to change, and problems experienced due to drinking. No significant differences were found for the total number of drinking days per week [$F(2, 147) = .25, p = .78$], the total number of drinks consumed per week [$F(2, 147) = .12, p = .89$], and peak alcohol consumption [$F(2, 147) = .96, p = .36$]. Furthermore, the groups did not differ significantly in readiness to change drinking behavior [$F(2, 147) = .96, p = .39$] and in consequences related to drinking including alcohol dependence problems [$F(2, 147) = .10, p = .90$], personal consequences [$F(2,
147) = .13, \( p = .88 \) and in social consequences \( F(2, 147) = .40, p = .67 \). The means and standard deviations for these variables are displayed in Table 2.

**Analysis of Attrition**

Given the high attrition rate over the course of the study, the data were examined for patterns of missingness. As shown in Table 3, at the outset of the study there were 150 participants (103 males, 47 females) who were assigned to BMI (\( n = 40 \)), DOC (\( n = 68 \)), and the no-treatment control condition (\( n = 42 \)). For the posttreatment assessment, only 130 participants (41 females and 89 males) were still available. By one-month follow-up, the participants had further shrunk to 104 (36 females and 68 males); and by the 3-month follow-up only 79 participants (27 females and 52 males) were still available for assessment. Of the 20 participants who were lost from pre to post, 1 was lost from BMI, 19 from DOC, and 0 from the Control condition. Of the additional 26 participants who were lost from post to the 1-month follow-up, 3 had received BMI, 18 DOC, and 5 had been assigned to the control condition. Finally, of the 25 participants lost from the 1- to the 3-month follow-up, 9 had been assigned to BMI, 8 to DOC, and 8 to the control condition. In sum, a total of 71 (43%) participants were lost from the beginning of the study to the 3-month follow-up. Specifically, the BMI condition suffered 13 dropouts (33%), the DOC group lost 45 (66%), and the control condition lost 13 participants (31%). This difference was statistically significant, \( F(2,147) = 2.21, p < .001 \) and post-hoc tests revealed that the DOC condition lost significantly more participants than either BMI (\( p < .001 \)) or the control condition (\( p < .001 \)).

To examine whether pretest variables were predictive of attrition, participants who dropped out were compared with those who continued in the study. Since the DOC
condition lost a sizeable number of participants from pre to post (19 of 68), \(t\)-tests were used to compare the pre-scores of dropouts and with those of continuing participants in DOC. No significant differences were found in the total number of days spent drinking per week \([M_1 \ 2.74, SD_1 \ 1.70; M_2 \ 2.43, SD_2 \ 1.47; t(66) = .74, p = .46]\); the total number of drinks consumed per week \([M_1 \ 20, SD_1 \ 17.13; M_2 \ 19.43, SD_2 \ 15.73; t(66) = .13, p = .90]\); and the peak number of alcoholic drinks consumed in the last month \([M_1 \ 6.32, SD_1 \ 2.61; M_2 \ 6.51, SD_2 \ 2.56; t(66) = -2.78, p = .78]\). Similarly, there were no significant differences in these participants’ readiness to change \([M_1 \ 3.89, SD_1 \ 3.28; M_2 \ 3.20, SD_2 \ 2.78; t(66) = .87, p = .39]\); in consequences that indicated alcohol dependence \([M_1 \ 1.42, SD_1 \ 1.50; M_2 \ 2.29, SD_2 \ 2.61; t(66) = -1.36, p = .18]\); in personal consequences \([M_1 \ 2.42, SD_1 \ 2.41; M_2 \ 2.51 SD_2 \ 1.91; t(66) = -.16, p = .79]\); and in social consequences \([M_1 \ 1.79, SD_1 \ 1.62; M_2 \ 1.90 SD_2 \ 1.43; t(66) = -.27, p = .79]\).

The next missingness analysis focused on the 1-month follow-up. By that time, a total of 46 participants (30.7%) had been lost, including 4 from BMI, 37 from DOC, and 5 from the no-treatment control condition. Univariate analyses of variance showed no differences between dropouts and continuing participants on pretreatment variables, such as the total number of drinking days per week \([F(1,144) = 2.34, p = .13]\); the total number of drinks consumed per week \([F(1,144) = 2.08, p = .15]\); and peak alcohol use \([F(1,144) = 2.64, p = .11]\). Similarly, there were no significant differences in consequences experienced that indicate alcohol dependence \([F(1,144) = .17, p = .68]\); or social consequences associated with drinking \([F(1,144) = 2.29, p = .13]\). However, there was a statistically significant difference at 1-month follow-up for personal consequences stated at pretest \([F(1,144) = 6.98, p = .01, \text{ partial eta squared .046}]\). Post-hoc analyses revealed
that the number of personal consequences was significantly higher for those who were lost (\(M = 3.66, SD = .50\)) than those who stayed (\(M = 2.25, SD = .36\)) in the study through to 1-month follow-up.

At the 3-month follow-up, only 79 of the 150 participants were still available for assessment because 13 had dropped out from BMI, 45 from DOC, and 13 from the control condition. Univariate analyses of variance revealed no statistically significant differences in pretest variables between dropouts and students who participated in the 3-month follow-up assessment on any of the following variables: total number of drinking days per week \([F(1,144) = 1.67, p = .20]\); total number of drinks per week \([F(1,144) = .69, p = .41]\); peak alcohol use \([F(1,144) = .06, p = .81]\); consequences experienced that indicate alcohol dependence \([F(1,144) = .08, p = .78]\); personal consequences \([F(1,144) = .60, p = .44]\); or social consequences \([F(1,144) = .02, p = .88]\).

An analysis of attrition was also conducted based on therapists. Specifically, attrition rates for the BMI condition were compared for the experimenter who served as therapist and for the combined data of the other two therapists. There was no statistically significant difference in dropout between participants seen by the experimenter and those seen by the other 2 therapists \((p = .28)\).

**Main analyses to examine drinking outcomes by condition**

*Alcohol consumption.* Because the drinking variables were significantly correlated (drinking days X number of drinks: \(r = .753, p<.001\); drinking days X peak alcohol level: \(r = .560, p<.001\); number of drinks X peak alcohol level: \(r = .732, p<.001\)), a repeated measures multivariate analysis of variance (MANOVA) was conducted with treatment modality (BMI, DOC, Control) as the between-subjects factor and time (pre,
post, 1 month, 3 months) as the repeated within-subjects factor. The dependent variables were the total number of drinking days per week, the total number of drinks consumed per week, and peak alcohol use in the last month. There was a significant main effect for time (Wilks’ $\lambda = .71, p = .004$), but the interaction for time by condition was non-significant (Wilks’ $\lambda = .88, p = .95$).

Post-hoc analyses revealed a similar overall pattern in the three drinking variables in that posttreatment levels were significantly lower compared to pretreatment levels and the lower levels were maintained at the follow-up periods. As shown in Table 4, the number of drinking days per week was highest at pretest ($M = 2.47, SD = 1.11$) and decreased significantly ($p = .004$) by the posttest ($M = 2.11, SD = 1.11$). Pretest levels were also higher compared to the 1-month follow-up ($M = 1.97, SD = 1.29, p = .011$) and the 3-month follow-up ($M = 1.90, SD = 1.34, p = .007$), while the latter did not differ among each other. Thus, participants lowered their alcohol consumption after the pretest and maintained the lower levels over the course of the study (see Figure 1).

Similarly, post-hoc analyses showed that the total number of drinks consumed per week was highest at pretest ($M = 18.80, SD = 13.20$) and decreased significantly by the time of the posttest ($M = 16.38, SD = 11.72, p = .042$). Pretest levels were also significantly higher compared to the 1-month follow-up ($M = 14.91, SD = 13.07, p = .006$) and the 3-month follow-up ($M = 13.06, SD = 11.75, p = .001$). The reduction from posttest to the 1-month follow-up was not significant ($p = .71$), but from posttest to the 3-month follow-up it achieved statistical significance ($p = .036$), indicating a downward trend in consumption. The data are displayed in Figure 2.
For peak alcohol use, the difference from pretest \((M = 6.61, SD = 2.37)\) to posttest \((M = 6.10, SD = 2.81)\) also did not quite achieve statistical significance \((p = .16)\), but the difference from pretest to the 1-month follow-up was significant \((M = 5.76, SD = 2.82, p = .016)\) and pretest levels also differed significantly from the 3-month follow-up \((M = 5.72, SD = 2.73, p = .007)\) (see Figure 3). This again indicated that the participants did indeed lower their alcohol consumption over the course of the study.

*Exploratory analysis with 1-month follow-up as the endpoint.* Given that almost half of the sample had been lost by the 3-month follow-up, an exploratory analysis was conducted with the 1-month follow-up as the end period, since 69.3% of the participants were still retained at this time point. However, the results were similar (see Figure 2). Again, there was only a significant main effect for time \((\text{Wilks’ } \lambda = .79, p = .001)\), whereas the interaction for time by condition was non-significant \((\text{Wilks’ } \lambda = .90, p = .61)\).

For all three drinking variables, post-hoc analyses revealed a decrease from pretest to posttest that was maintained at the 1-month follow-up. Specifically, the total number of drinking days per week decreased significantly from pretest \((M = 2.47, SD = 1.17)\) to posttest \((M = 2.19, SD = 1.20, p = .006)\) and from pretest to the 1-month follow-up \((M = 2.0, SD = 1.32, p = .001)\). Similarly, the total number of drinks consumed per week decreased significantly from pretest \((M = 18.53, SD = 13.55)\) to posttest \((M = 16.34, SD = 11.89, p = .028)\) and from pretest to the 1-month follow-up \((M = 14.93, SD = 13.36, p = .001)\). Finally, the same pattern was observed for peak alcohol consumption with a significant decrease from pretest \((M = 6.46, SD = 2.46)\) to posttest \((M = 5.97, SD = 2.92, p = .037)\) and from pretest to the 1-month follow-up \((M = 5.59, SD = 2.77, p = .
.001). There were no significant differences on any of the three drinking variables from post to the 1-month follow-up, indicating that the decrease in consumption occurred from pre- to posttest and was maintained at the 1-month follow-up. The means and standard deviations are displayed in Table 4.

To test for the possibility of therapist effects, a repeated measures analysis of variance (ANOVA) was conducted. The experimenter had treated 20 students in the BMI protocol whereas the other two therapists together had treated 7 students. The repeated measures ANOVAs for each of the three drinking variables had therapist as the between-subjects factor (experimenter versus the other two therapists combined) and time as the within subjects factor (pre, post, 1 month, 3 month). In each analysis, the interaction of time by therapist was found to be non significant for the drinking variables, including number of drinking days (Wilks’ \( \lambda = .86, p = .32 \)), total drinks consumed (Wilks’ \( \lambda = .88, p = .39 \)) and peak alcohol use (Wilks’ \( \lambda = .92, p = .57 \)). Thus, no therapist effects were detected.

*Readiness to change alcohol use.* As the BMI condition emphasized motivational enhancement, a repeated measures ANOVA was conducted with readiness to change as the dependent variable. As the means and standard deviations displayed in Table 4 show, the absolute values of participants’ motivation to change seemed to increase over time for the BMI and the DOC condition, but the effects were not significant. The repeated measures ANOVA revealed neither a significant main effect for time (Wilks’ \( \lambda = .94, p = .21 \)) nor a significant interaction for time by condition (Wilks’ \( \lambda = .97, p = .89 \)).

For exploratory purposes the analysis was repeated, using the 1-month follow-up as the endpoint. Again, any observed changes in the readiness-to-change variable did not
achieve statistical significance because the repeated measures ANOVA revealed neither a significant main effect for time (Wilks’ \( \lambda = .97, p = .19 \)) nor a significant interaction effect for time by condition (Wilks’ \( \lambda = .95, p = .25 \)).

**Summary of results.**

To recapitulate, the study arrived at the following findings. First, by the three-month follow-up almost half of the participants were lost to attrition. With one exception (i.e., the baseline level of the severity of personal consequences experienced on account of alcohol use), none of the baseline variables was predictive of who would drop out. Second, all participants who remained in the study through its conclusion showed significant decreases in alcohol consumption and maintained these lower alcohol use levels. However, there was no differential impact of the two interventions or the control condition on alcohol use. Third, in the BMI condition there were no significant differences in the drinking variables based on therapist. Finally, the BMI intervention did not differentially increase the participants’ readiness to change; rather, readiness remained at the same level across time for participants in all condition.
CHAPTER 5

Discussion

Overview

This was the first study with mandated college students that examined the possible differential effects of two treatments, one an individualized treatment (BMI) and the other a group oriented treatment (DOC, treatment as usual), compared to a no-treatment control condition. This study proposed that both treatment interventions would fare better than the no-treatment control condition, but the results did not support this hypothesis. It was further proposed that BMI would prove to be a more effective treatment than DOC in reducing excessive involvement with alcohol, but again the results did not support this hypothesis because the three conditions did not differ from each other. However, this study did find that students made positive changes over time across all conditions, significantly reducing their drinking behavior and retaining the reductions through the 3-months follow-up. Surprisingly, students’ readiness to change did not follow a similar pattern because this variable remained at a modest level throughout the study, without significant changes over time or differences among the conditions.

Discussion of major findings

The lack of treatment effects. There is evidence in the literature that BMI interventions are effective. However, studies that have shown the effectiveness of BMI in reducing drinking behavior and alcohol-related problems were typically conducted with students who volunteered to participate in research (Agostinelli et al., 1995; Marlatt et al., 1998; Murphy et al., 2001 Collins et al., 2004, Neighbors et al., 2004). In contrast, studies with mandated students have often not reported the same differential effects. In this sense, then, the results of the present study are consistent with those of others, indicating
that the jury is not out with regard to what is effective with mandated students as opposed to those who have not come to the attention of school authorities and volunteer for participation in research. Similar to the current study, other studies (e.g., White et al., 2006; Barnett et al., 2007), have also found that BMI is effective in reducing the alcohol consumption of college students, but no more effective than other interventions. In the White et al. (2006) study, mandated students were treated either with face-to-face BMI or written feedback; students improved but there was no difference between conditions. In the Barnett et al. (2007) study, students received either a one-session BMI or a computer-delivered intervention and again there were no group differences in alcohol-related problems or drinking at a 12-month follow-up. The authors concluded that reductions of college students’ alcohol consumption attributed to treatment may not be specific to any one condition. Since neither study included a no-treatment control condition, these studies cannot address the question of whether treatment was even a necessary factor in the observed behavior changes.

Of course, the degree to which even “mandated” students are truly mandated is debatable. So-called mandated students are required by university authorities to participate in some form of intervention, but like other students they are given the option to participate in research or take part in “treatment-as-usual” (in the present case, DOC). In that sense, even mandated students who decide to participate in a research study become a self-selected subset of the mandated population. But for ethical reasons this problem cannot be resolved because we cannot compel students to participate in research. Thus, we cannot rule out that this subset of students who signed up for the study may not be an accurate representation of the total mandated population. Perhaps students who
chose to participate in research were already significantly affected by the mere fact that they were caught in a rule violation and perhaps these students had already begun to make changes as a consequence of the citation. Other students who did not opt to participate in the study could have been less affected by the citation and simply went along with the university specified consequences. As pointed out by Fromme and Corbin (2004) and White et al. (2007), this might contribute to the inconsistent findings arising in the literature. This may also be the reason for the findings in the present study, where we were not only unable to demonstrate differential effects of the two treatment conditions but also found no evidence that treatment achieved superior outcomes than no treatment at all.

A factor that may have introduced considerable variability and may therefore explain to some degree the lack of differential findings in this study is that for the mandated participant’s treatment was not always provided in close proximity to the actual infraction. Delays could have happened because of administrative inadequacies (e.g., backlog of paperwork, inability to schedule a meeting time with student), student-caused delays (e.g., missed appointments and the need to reschedule meetings) as well as naturally occurring breaks (e.g., within- and between-semester breaks), which all could have affected the timeliness of the referral and the initial assessment, particularly in DOC. Depending on the length of the interval between the violation and the initial assessment, students may have entered treatment with different experiences or changes in both attitude and behavior. Thus, assessing “past month’s drinking behavior” for a good number of students may already have been measuring change and may not have accurately reflected their pre-sanction drinking behavior or their pre-sanction motivation
to change. This would have led to an underestimating of the actual change that has occurred since the violation. However, even if the true decrease in drinking behavior had been stronger, this does not negate the fact that students at the post- and follow-up assessments continued to show relatively high levels of alcohol consumption despite the statistically significant decreases in use.

Unfortunately, in this study we did not assess how much of the drinking that continues at fairly high rates in this population is due to students’ attitudes and expectancies of what it means to be at college and how alcohol plays a role in that experience. For many college students, drinking is considered a “rite of passage”, and they may either not be aware or it may not matter to them that their drinking is much higher than the general norm. High alcohol use may be something that they aspire to or expect of themselves and their peers. In other words, they may expect to be part of “the partying crowd” and to have status within this subculture. This may explain why the behavior change observed in this study was relatively modest, and why there was no significant change in attitude or motivation to change. On average, mandated students likely used alcohol at considerably higher levels than students who have not had contact with authorities over an alcohol policy violation. However, if they are members of a specific subculture and consider excessive drinking as a normal part of college life, they may have been less willing to report the degree of their alcohol consumption truthfully and their reports may be more a reflection of what they think the assessor wants to hear. Hence it would be important to understand the expectancies of these mandated students as they may be more unique. This might then allow us to arrive at a better understanding of the mechanisms of change that are in play for this subculture of drinkers.
As stated above, the participants in this study maintained modest changes in drinking behavior across time, yet there was no concomitant increase noted in their motivation to change. The motivation in the current sample was relatively low to begin with and remained so throughout the study. Other research with mandated students has also reported low levels of motivation (e.g., Caldwell, 2002). Interestingly, research has also found that increases in motivation to change actually follow rather than precede interventions for mandated students (Palmer, 2004). In fact, White et al. (2007) reassessed participants at 15-months follow-up that were in their previous study (White et al., 2006). At 15-month follow-up they found that those treated with BMI reported lower number of peak use experiences, which was not the case at the 4-month follow up. They referred to this as a “sleeper effect.” Unfortunately, in the current study no data beyond the three-month follow-up are available. Hence it is not possible to assess whether such a sleeper effect has also been obtained with the current sample such that motivation to change may become stronger over time for participants in the BMI condition.

Possible reasons for high attrition. Another issue that requires discussion is the high attrition rate. Although the university’s residential life staff was trained in best methods for making referrals to this study, apparently not everyone heeded the instructions when recruiting students. It was not uncommon that research participants arrived at the first meeting with the experimenter, expecting to receive individual treatment or no treatment at all, when in fact a significant portion was randomized to DOC. This may have frustrated students and influenced attrition rates, which would explain why there were significantly more dropouts from the DOC condition in this study.
An attempt was also made to identify possible pre-treatment variables that could predict attrition. Of all the variables examined at pretest, only “personal consequences associated with drinking” (e.g., issues such as not being able to do homework or study for a test; missing out on other things because the student spent too much money on alcohol; going to work or school being high or drunk; and neglecting one’s responsibilities) were significantly associated with attrition. Specifically, students who at baseline endorsed more severe personal consequences on account of excessive alcohol use were more likely not to complete the study. We speculate that those who were experiencing more personal consequences were more defensive about their drinking and less willing to see their alcohol use as a problem or as being related to their personal problems. While they endorsed more personal consequences, it is possible that these students did not really perceive these consequences as problems but perhaps simply as normal experiences that are part of college life. If this is correct, it is reasonable to assume that these students would also be less inclined to change their behavior just because they were caught in committing a policy violation. They may even externalize the problem associated with getting caught since within their world view they did not do anything wrong that should warrant negative sanctions. Hence, these students may be more in a stage of denial and therefore assume a stance of defiance. If this reasoning is correct, this group may be at highest risk, and if such students could be retained in treatment and positively affected, they might reap the greatest gains in terms of increased motivation to change and reducing their drinking behavior. In fact, this was the very group we expected to influence, and yet these seemed to be the students who were least likely retained. Losing so many of these students over the course of the study may have contributed to the null
effect regarding the three intervention conditions. Maybe the students who were retained were all sufficiently determined to make positive changes and not to risk another alcohol-related policy violation, which is consistent with the finding that the no-treatment control participants had the same outcomes as the treatment participants. If we had retained students who suffered more significant personal consequences on account of their drinking, perhaps one or both of the treatment conditions would have risen above the control condition.

Another reason for the particularly high attrition from the DOC condition may have been that DOC was not under the control of the experimenter but was implemented by staff from the University Counseling Center in collaboration with the Office of Conflict Resolution and Civic Responsibility. As stated above, DOC also differed from the BMI and the control condition in that the two intervention sessions were less likely to be offered in close temporal proximity to the initial referral, and the first and second sessions often were months apart. The first session occurred some time after the alcohol policy violation, whereas the second session for all students in DOC was only offered once at the end of the semester. In contrast, participants assigned to the BMI and the control conditions were seen within days of the initial referral for their first session, and the second session was always scheduled seven to ten days after the first meeting. For participants in these conditions, the follow-up assessment meetings tended to occur throughout the semester and for most of these students were less likely to be scheduled during the extended summer or winter semester break periods. In contrast, for participants in DOC, the follow-up assessment sessions typically occurred during a semester break. This may to some extent explain the significantly larger rate of attrition.
from DOC. However, since attrition also occurred from the other two groups, albeit at a lesser rate, it is likely that some students missed the assessments simply because they were not a priority for them and there were no consistent negative consequences associated with not completing the study, since forced continuation in a research study would be considered coercion.

One additional factor that could have influenced both the findings and the attrition rate is inherent in conducting research with college populations. Each semester has its own challenges in terms of getting timely referrals and having access to students before they leave campus for vacations and breaks. During such times, students typically do not reside on campus and changing location may alter their drinking practices. Their alcohol use may now be influenced by parental oversight, work responsibilities, and different peer groups at home versus at school. Unfortunately, these problems are inevitable in studies with a college population, but they nevertheless can affect their outcome.

Finally, this study also had limited resources to provide adequate incentives for participants to remain in the study. It is likely that this lack of adequate incentives contributed to a higher attrition rate than those reported in other studies. For example, White et al. (2006) paid their participants $25-$30 per follow up assessment and they also paid those who were randomly assigned to booster sessions an additional $40.00. Consequently, these investigators reported a 94% completion rate. If we had been able to offer significant incentives, we might well have retained more participants throughout the follow-up period of the study.

Changes in alcohol use behavior. An interesting observation that requires elaboration relates to the degree to which study participants lessened their alcohol use.
While the students showed statistically significant decreases in alcohol use, an inspection of the data and particularly of Figures 1-3 raises questions about the clinical significance of these changes. The data show that drinking days decreased from 2 ½ to 2 days per week, the average number of drinks consumed per week decreased from 19 distributed over 2 ½ days to 14 distributed over 2 days, and the peak interval of alcohol use decreased from 6.5 to approximately 6 (both intervals fall into the range of 9-10 drinks). Despite the observed relative reductions, these data suggest that many students probably continued to use alcohol excessively. In this sense then, doubt is cast upon the significance of any of the three experimental interventions.

The findings from this study are similar to those of other studies, such as White et al. (2006) and Barnett et al. (2007). These studies also reported decreases in the quantity of drinking of close to two drinks per week, but similarly to the present research, these decreases, while statistically significant, lacked clinical significance. Hence, doubt is cast on the utility and efficacy of these brief interventions with this population. Like the students in the present study, those in the other studies also continued to drink at rather high rates, with an average weekly consumption of fifteen or more drinks. This level of alcohol consumption challenges the success of brief interventions with mandated college students.

However, the measures used in this study may somewhat underestimate the effects that were obtained. Perhaps it is not the best way to measure a successful reduction in excessive drinking with this group by assessing number of drinking days, drinks consumed per day, or peak alcohol level. Instead of using quantity as the only measure of change, a more sensitive measure of change would have been BAC over time.
This would require a more fine-grained analysis of standard units of alcohol consumed per hour calculated over the course of a drinking episode. As significant reductions were undoubtedly measured, perhaps they would appear more meaningful if we were able to ascertain that the participants consumed alcohol more slowly over a larger period of time, which would have indicated that the average and peak BAC had decreased considerably as a function of participating in the study. Methods of reporting number of drinks could be done in a more visual and interactive manner, especially if the initial assessment information is collected on line and this could also pull for more accurate information. Other studies had used BAC as a drinking measure. White et al, (2006) did use BAC and did find Other studies have used BAC, but is not clear that students

_The usefulness of motivational interventions such as BMI._ Another very important question to be asked is the degree to which motivational interventions such as BMI are truly useful for alcohol abusing college students who come to the attention of college administrators for a violation of the institution’s alcohol use policy. BMI is conceptually grounded in Prochaska and DiClemente’s Stages-of-Change model, and it is reasonable to ask whether this model is a true fit for a college student population, particularly in the early stages of college. Although drinking behavior changed over the course of this study, this change did not coincide with a concomitant increase in self-reported readiness to change.

Students arrive at college with varying degrees of prior drinking experience, from none at all to quite extensive involvement with alcohol. And even those who have experience with alcohol use do not have the same experience away at college when drinking occurs in the absence of parental restraints. According to the theoretical model
underlying BMI and similar interventions, individuals may initially be in a stage of precontemplation, which means that they are in denial or simply unaware that a drinking problem exists. College students who engage in heavy drinking and particularly those who are mandated for treatment may in fact not be truly in a stage of precontemplation. They have not engaged in excessive alcohol use long enough and therefore have not experienced enough self-identified negative consequences that would make them contemplate change in the direction of decreasing their alcohol use. College students in the early years may find themselves in a process that precedes precontemplation and that is best described as a state of flux with regard to change. Therefore, examining such students’ readiness to change may not yield an adequate assessment of their experience because in the initial college years they may simply not at all be concerned with precontemplation or contemplation of change. On the contrary, alcohol use, and even excessive alcohol use, is a normative behavior among a subset of students. Thus, such students may not be motivated to make significant changes in their alcohol use because their desire to engage in drinking is associated with their desire to be social, and excessive drinking while socializing with friends is normative within specific subcultures (Borsari, 1999).

_Is treatment necessary to change drinking behavior?_ In this study, it was not only the participants in the two intervention conditions who reported behavioral changes, but those assigned to the no-treatment control group showed equivalent modest reductions in alcohol consumption. This suggests that other, unmeasured variables aside from treatment affected the students’ alcohol use. The most likely candidate for such a variable that effectuated behavior change is the fact that the students had come to the attention of
university authorities and were being cited for a violation of existing alcohol policies. This citation alone may have been sufficient to instill behavior change. This interpretation is all the more reasonable in light of the fact that students in all three conditions in the present study showed the same outcomes.

Thus, one can conclude that, in the present study, treatment was not a necessary factor in obtaining the observed results. Whether students met with an individual counselor who employed motivational techniques, or participated in two DOC group sessions, or simply underwent the assessments without any further intervention, there was the same degree of change in drinking behavior. Being called before university authorities may have made a significant impression upon many of these young drinkers, which may have been in and of itself sufficient to instill behavior that would decrease the probability of future contacts with authorities. As this change was motivated by fear of consequences if they would get caught again rather than being intrinsically derived from insights about the danger of their excessive alcohol use, it is not surprising that this type of fear-induced “forced” change did not express itself as high intrinsic motivation on the stages-of-change questionnaire.

Based on these findings, it would seem that the reduction of excessive alcohol use among college students may not be best addressed with interventions, regardless of their nature, but rather with prevention. If we understand the importance of socializing and how students deal with peer pressure to socialize and drink, we may be able to explore better strategies that will assist students in navigating the different choices they are making about drinking.

Limitations
The findings should be considered in light of a number of limitations. As already pointed out above, a significant limitation of the present study was that the lack of control over the DOC condition and the fact that the assessments for the three different conditions were conducted at vastly different time intervals. For the participants in BMI and the no-treatment control condition the pre/post assessment intervals were spaced at approximately 7-10 days. In contrast, in the DOC condition the pre/post assessment could have been apart more than three months for students who early in the semester were caught in a violation of the alcohol policy, or perhaps only days or a few weeks for participants who got caught toward the end of the semester. These disparate times in the pre/post assessments also led to large discrepancies in the time from the initial violation to the one- and three-month follow-ups and introduced a degree of variability in the study that may have drowned out possible findings in noise.

Another problem was the inconsistency in how Residential Life staff made referrals to the study. Some students thought that participating in the study would prevent them from being assigned to DOC and were frustrated when they learned that there was indeed a chance that they would be randomized to DOC. This misperception of treatment options may have contributed to the higher dropout rate in DOC because some students may have felt misled. To prevent similar inconsistencies in future research, it would be necessary for study personnel to supervise and, if necessary, retrain Residential Life staff to ensure adherence to the referral protocol.

Another problem is related to the BMI condition. The study protocol did not include treatment adherence, treatment fidelity and counselor competency checks to assess whether the intervention was administered by all counselors in accordance with MI
principles in a consistent manner. Although the graduate student counselors were trained by the experimenter, it is nevertheless possible that professional counselors with more experience in BMI interventions would have delivered the intervention more competently. This might have led to superior results in the BMI condition. Future research should therefore include adherence, fidelity and competency checks.

Finally, a significant problem was also due to the overall high dropout rate. Forty-three percent of the students were lost by the time of the three-month follow-up; specifically, two thirds of the DOC participants and about one third each of the BMI and the Control Group participants had left the study prematurely. This casts doubt on the findings because we have no knowledge about the reasons for which so many participants dropped out. On the one hand, it is possible that some of the dropouts had improved their drinking habits significantly and felt no need to continue with the study. On the other hand, it is also likely that many of the dropouts did not want to return for additional assessments because their drinking behavior had resumed its original level and they did not want to face the assessor. Similar findings have been observed in the adult substance abuse literature. Thus, it is unclear what results would have been obtained if all participants had been retained in the study through its conclusion. It is possible that stronger results might have been obtained, but it is also possible that the observed significant time effect might have been eroded. In externally funded studied, resources are typically available to incentivize participants to take part in the assessments, regardless of whether they completed treatment. As this was an unfunded study, no such incentives could be offered. Nevertheless, in future studies a stronger attempt should be
made to contact dropouts by telephone, via email, or in person to find out why they
decided to discontinue participation.

An additional limitation was that no data were available on the total number of
eligible students. While the university, outside of any research protocol, refers violators
of its alcohol policy to the DOC program, no mechanism exists by which an initial
prescreen for all mandated students would be implemented. An online pre-screen
assessment of all mandated students before referring them to an intervention like DOC
would provide important information of the whole group of violators. This would
eventually allow for a more fine grained approach and step-wise treatment options that
respect the heterogeneity of this group because not all students who get referred to
authorities have the same drinking pattern or abuse alcohol to the same degree. As no
such mechanism exists, the experimenter was not able to identify relevant background
variables on all students who had come to the attention of university authorities for
alcohol abuse because only if students agreed to participate in the study were they
referred for an assessment. Data were also not available on how many students had
violated the policy, and what percentage of these students agreed or declined to
participate in the study. Additionally, prior infractions, drinking related or not, were not
assessed, and it is not clear if some of the participants had already received a previous
intervention.

One final limitation was that in this study the assessments were conducted based
solely on students’ self-reported drinking patterns. No collateral reports were obtained
and no controls were implemented to address potential biases in reporting. However,
prior studies have shown that collateral reports are not always reliable (Marlatt et al.,
1998), particularly with students who live away from home. Perhaps future studies could, with the participants’ permission, recruit students’ close friends at college as independent reporters, Friends are typically aware of their friends’ habits and this might increase the reliability of student research participants’ alcohol use reporting.

Conclusions and Future Recommendations

The findings from this study add to the growing body of research that has shown that people change an addictive behavior often spontaneously and often as a consequence of a negative experience, regardless of whether they receive treatment. The findings also call into question the automatic referral for treatment when students are caught violating the university’s alcohol policy. Despite the limitations previously discussed, the findings suggest that getting caught and being sanctioned by university officials may in itself be sufficient for many students to change their behavior in the desired direction of reducing their alcohol consumption.

Of course, since most of the students who came to the attention of authorities not only had violated a policy but were also under the legal drinking age and therefore had committed an illegal behavior, it is understandable that universities implement interventions that go beyond a simple sanction, if for no reason other than self-protection.

However, if universities make it their business to deal with alcohol policy violations by mandating students into an intervention, then the present study reveals the presence of a significant problem. Although students in this study decreased their alcohol use, regardless in what intervention they participated, it is also true that the average alcohol consumption of 14 drinks per week remained rather high. This is of particular concern, given that the average age of the participants in this study was only 18.9 years,
which is far below the legal drinking age. This outcome begs the question. Since the no-intervention control group achieved the same outcome as the BMI and DOC interventions, it is reasonable to ask whether university resources are best dedicated to programs such as DOC, which on balance do not seem to be as effective as one would hope. Perhaps resources would be better invested in creative internet-based and entertaining programs that are educational and motivation-enhancing and would be suitable for students who are already engaged in drinking.
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Table 1.

*Demographics and Grade Point Average*

<table>
<thead>
<tr>
<th>Variable</th>
<th>BMI (n = 40)</th>
<th>DOC (n = 68)</th>
<th>Control (n = 42)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mean (SD) Age</strong></td>
<td>18.9 (0.85)</td>
<td>18.8 (0.80)</td>
<td>18.8 (0.75)</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>25 (62.5%)</td>
<td>47 (69.1%)</td>
<td>31 (73.8%)</td>
</tr>
<tr>
<td>Female</td>
<td>15 (37.5%)</td>
<td>21 (30.91%)</td>
<td>11 (26.8%)</td>
</tr>
<tr>
<td><strong>Race/Ethnicity</strong></td>
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<td></td>
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<tr>
<td>Caucasian American</td>
<td>31 (77.5%)</td>
<td>52 (76.5%)</td>
<td>33 (78.6%)</td>
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<tr>
<td>African American</td>
<td>2 (5.0%)</td>
<td>5 (7.4%)</td>
<td>2 (4.8%)</td>
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<tr>
<td>Hispanic/Latino</td>
<td>4 (7.5%)</td>
<td>4 (5.9%)</td>
<td>3 (7.1%)</td>
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<tr>
<td>Asian American</td>
<td>-</td>
<td>4 (5.9%)</td>
<td>4 (9.5%)</td>
</tr>
<tr>
<td>Other</td>
<td>4 (10.0%)</td>
<td>4 (4.4%)</td>
<td>-</td>
</tr>
<tr>
<td><strong>GPA</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.0</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>3.5</td>
<td>-</td>
<td>1 (1.5%)</td>
<td>2 (4.8%)</td>
</tr>
<tr>
<td>3.0</td>
<td>32 (80.0%)</td>
<td>50 (73.6%)</td>
<td>27 (64.3%)</td>
</tr>
<tr>
<td>2.5</td>
<td>8 (20.0%)</td>
<td>15 (22.0%)</td>
<td>11 (26.2%)</td>
</tr>
<tr>
<td>2.0</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>&lt;2.0</td>
<td>-</td>
<td>2 (2.9%)</td>
<td>2 (4.8%)</td>
</tr>
</tbody>
</table>

*Note.* BMI = Brief Motivational Intervention; DOC = Discussing Our Choices; GPA = Grade Point Average.
Table 2

*Baseline Alcohol Use, Alcohol-Related Consequences, and Readiness to Change*

<table>
<thead>
<tr>
<th>Variable</th>
<th>BMI (n = 40)</th>
<th>DOC (n = 68)</th>
<th>Control (n = 42)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
</tr>
<tr>
<td>Weekly Alcohol Use</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drinking Days</td>
<td>2.70</td>
<td>1.32</td>
<td>2.51</td>
</tr>
<tr>
<td>Drinks</td>
<td>19.15</td>
<td>14.90</td>
<td>19.60</td>
</tr>
<tr>
<td>Peak Use</td>
<td>6.43</td>
<td>2.32</td>
<td>6.46</td>
</tr>
<tr>
<td>Alcohol-Related Consequences</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alcohol Dependence</td>
<td>2.13</td>
<td>2.59</td>
<td>2.04</td>
</tr>
<tr>
<td>Personal Consequences</td>
<td>2.40</td>
<td>2.26</td>
<td>2.49</td>
</tr>
<tr>
<td>Social Consequences</td>
<td>1.78</td>
<td>1.35</td>
<td>1.87</td>
</tr>
<tr>
<td>Readiness to Change</td>
<td>2.68</td>
<td>2.56</td>
<td>3.40</td>
</tr>
</tbody>
</table>

*Note.* BMI = Brief Motivational Intervention, DOC = Discussing Our Choices, Control = No Treatment Control, Drinking Days = Number of days per week drinking, Drinks = Number of drinks per week, Peak Use = Highest number of drinks on one occasion consumed in the last month, Readiness to Change = Rating of one’s readiness to change alcohol use (scale 1-9).
Table 3

*Attrition Rate for Subjects across Condition and Time*

<table>
<thead>
<tr>
<th>Time</th>
<th>BMI (n = 40)</th>
<th>DOC (n = 68)</th>
<th>Control (n = 42)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Available</td>
<td>Missing</td>
<td>Available</td>
</tr>
<tr>
<td>Males (n = 103)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pretest</td>
<td>25</td>
<td>0 (0%)</td>
<td>47</td>
</tr>
<tr>
<td>Posttest</td>
<td>25</td>
<td>0 (0%)</td>
<td>33</td>
</tr>
<tr>
<td>1-Month Follow-up</td>
<td>23</td>
<td>2 (8%)</td>
<td>17</td>
</tr>
<tr>
<td>3-Month Follow-up</td>
<td>17</td>
<td>6 (26%)</td>
<td>13</td>
</tr>
<tr>
<td>Females (n = 47)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pretest</td>
<td>15</td>
<td>0 (0%)</td>
<td>21</td>
</tr>
<tr>
<td>Posttest</td>
<td>14</td>
<td>1 (6%)</td>
<td>16</td>
</tr>
<tr>
<td>1-Month Follow-up</td>
<td>13</td>
<td>1 (7%)</td>
<td>14</td>
</tr>
<tr>
<td>3-Month Follow-up</td>
<td>10</td>
<td>3 (23%)</td>
<td>10</td>
</tr>
</tbody>
</table>

*Note.* BMI = Brief Motivational Intervention, DOC = Discussing Our Choices, Control = No Treatment Control
Table 4

*Means and Standard Deviations for Drinking Variables across Condition and Time*

<table>
<thead>
<tr>
<th>Time</th>
<th>BMI ((n = 40))</th>
<th>DOC ((n = 68))</th>
<th>Control ((n = 42))</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(M)</td>
<td>(SD)</td>
<td>(M)</td>
</tr>
<tr>
<td>Pretest</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drinking Days</td>
<td>2.85</td>
<td>1.17</td>
<td>2.17</td>
</tr>
<tr>
<td>Drinks</td>
<td>19.85</td>
<td>12.62</td>
<td>17.30</td>
</tr>
<tr>
<td>Peak Use</td>
<td>6.81</td>
<td>2.23</td>
<td>6.26</td>
</tr>
<tr>
<td>Readiness to Change</td>
<td>2.74</td>
<td>2.51</td>
<td>3.26</td>
</tr>
<tr>
<td>Posttest</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drinking Days</td>
<td>2.52</td>
<td>1.34</td>
<td>1.83</td>
</tr>
<tr>
<td>Drinks</td>
<td>18.15</td>
<td>11.68</td>
<td>15.35</td>
</tr>
<tr>
<td>Peak Use</td>
<td>6.81</td>
<td>2.63</td>
<td>6.26</td>
</tr>
<tr>
<td>Readiness to Change</td>
<td>3.41</td>
<td>2.74</td>
<td>4.09</td>
</tr>
<tr>
<td>1-Month Follow-up</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drinking Days</td>
<td>2.19</td>
<td>1.08</td>
<td>1.74</td>
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<tr>
<td>Drinks</td>
<td>17.11</td>
<td>12.78</td>
<td>13.87</td>
</tr>
<tr>
<td>Peak Use</td>
<td>6.07</td>
<td>2.77</td>
<td>5.52</td>
</tr>
<tr>
<td>Readiness to Change</td>
<td>3.85</td>
<td>3.93</td>
<td>4.17</td>
</tr>
<tr>
<td>3-Month Follow-up</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drinking Days</td>
<td>2.11</td>
<td>1.09</td>
<td>1.70</td>
</tr>
<tr>
<td>Drinks</td>
<td>14.56</td>
<td>10.45</td>
<td>11.52</td>
</tr>
<tr>
<td>Peak Use</td>
<td>6.15</td>
<td>2.51</td>
<td>5.30</td>
</tr>
<tr>
<td>Readiness to Change</td>
<td>3.56</td>
<td>2.97</td>
<td>3.91</td>
</tr>
</tbody>
</table>
Note. BMI = Brief Motivational Intervention, DOC = Discussing Our Choices, Control = No Treatment Control, Drinking Days = Number of days per week drinking, Drinks = Number of drinks per week, Peak Use = Highest number of drinks one time in the last month, Readiness to Change = Rating readiness to change alcohol use.
Figure 1. Mean drinking days per week across time points.
Figure 2. Mean drinks per week across time points.
Figure 3. Mean peak alcohol use interval across time points.
Appendix A

Initial Assessment

<table>
<thead>
<tr>
<th>Subject Initials: _________</th>
<th>Date: ____________________</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subject ID#: ______________</td>
<td>Interviewer: ______________</td>
</tr>
</tbody>
</table>

THREE MAIN GOALS:
1. building rapport
2. orienting
3. gaining commitment (actually get a verbal commitment when they are signing the consent form)

Points **must** make in the initial and second interview:
- you decide to change or not
- we will provide strategies you can use or not use
- what you do with information and experience is up to individual

Discuss **Initial session**
1. **Orienting**: lay out of the land, what to expect and what is expected of them
   - You will complete some questionnaires before we meet and that may take about 50 min.
   - We will then meet and I will spend approx. 50 min. with you and ask you some questions about your drinking, your experience with judicial affairs, and questions about family and friends

2. **Commitment**: asking student to provide most truthful and most thoughtful answers. Tell student you will do the best you can to provide the student with a beneficial experience and you would like the student to give a commitment as well.

**Questions**: Does student have any questions or topics related to alcohol use that are of particular interest to them?
Questions
Begin with asking student if they have any questions related to the topic of drugs or alcohol that they wanted answered? Write them down and tell them this will be discussed during the second meeting.

Personal Information
1. Can you describe what occurred that lead to your referral to Judicial Affairs? (You want to assess: level of responsibility, reaction to being caught, understanding of consequences)

   Description of Incident:
   __________________________________________________________________________
   __________________________________________________________________________
   __________________________________________________________________________

   Reaction:
   __________________________________________________________________________
   __________________________________________________________________________

   Responsibility:
   __________________________________________________________________________

   Understanding:
   __________________________________________________________________________

2. Who was involved:
   __________________________________________________________________________
   __________________________________________________________________________

3. How old were you when you first began to drink?
   __________________________________________________________________________

4. How did you learn to drink? (through friends, siblings, family) (How did you know what to drink, how much to drink and where to drink or get your alcohol?)
   __________________________________________________________________________
   __________________________________________________________________________
   __________________________________________________________________________

5. Tell me about your drinking in high school and over the summer? (How much drank – best guess, how often, how or why did it change or stay the same)
   H.S.:  Amt. Generally ____________  How often ____________
   Comments:
   __________________________________________________________________________

   Summer: Amt. Generally ____________  How often ____________
   Comments:
   __________________________________________________________________________
6. Have you ever experienced a blackout?  ____Y/N____ If so, how many times?  
   __________.

7. Have you ever experienced brownouts (momentary loss of time during the course of 
   drinking)  ____Y/N____ How many times?  ____________

8. Have you ever experienced greyouts (where next day do not remember certain details 
   or experiences until someone else starts to recount them and then they start to come 
   back)  ____Y/N____ How many times?  ____________

9. Did any of your friends come to this college with you?  ____Y/N____

10. If yes, do you continue to hang out with them?  ____Y/N____

11. How many new friends have you made here?  ___________

12. How many of them do you drink with regularly?  ___________

13. How does your drinking differ with friends from home vs your college friends?  
   ___________

14. Where do you like to drink? (write down bars and other places)  ___________

15. How do you get your alcohol and who generally pays for the drinks?  _______

16. What do you typically drink?  ___________

17. Does it differ depending on funds?  ___________

18. If you have a budget or set amount of funds for drinking how much is it?  
   ___________

19. Do you play drinking games?  Yes/No  ____ How often?  _______
   Do you play  with males  with females  with both  ___________

20. Do drinking games make it easier to socialize?  ____ yes/no _______

21. Did you have a girlfriend/bf in High School?  ___________

22. Do you have a girlfriend/boyfriend now?  ___________

23. Does your boyfriend/girlfriend drink and party similar to you?  If not, what do they 
   think of your drinking?  ___________

24. How did you decide to come to SUNY Albany?  ___________
25. Did you know it was identified as a party school? And, did that influence your decision to come here? _______________________________________

Assess Drinking I would like to talk more about how and when you use alcohol.

Do the brief drinker profile NOW THIS IS A MEASURE OF CURRENT USE

FIRST

Steady Pattern

Then

Episodic Pattern (e.g. playoff game, special birthday)

Assess Alcohol Dependence

1. Have you ever found that when you started drinking, you ended up drinking much more that you were planning? ______ Y/N ______

2. Have you ever spent a lot of time drinking, being high, or hung over? ______ Y/N ______

3. Have you ever drank so often that you drank instead of working or spending time at hobbies or with your family or friends? _______________________________________

4. Have you ever found that you needed to drink a lot more in order to get high, compared to when you first started drinking? _______________________________________

Family History ~ Substance/Alcohol Use & Psychological Problems

Now I would like to ask some questions about your family. By family we are including your blood/biological, adoptive or other parenting figures. Any questions? Are there individuals other than your blood relatives who are considered family?

Alcohol and drug problems can mean different things to different people. For our purposes “problems” are defined as behaviors that are causing difficulties in living for the person, or somehow compromises the person’s ability to function as he/she is otherwise capable of doing. It could include family, marital problems, work or legal problems. Things such as a divorce, if it was due to drinking or psychological issues or if the person misses work for extended periods of time for either drinking or depression. Any questions?
1. Have any of your grandparents ever had difficulties with alcohol or other substances, or have any of them ever experienced psychological difficulties that compromised some aspect of their life functioning?

2. Have either of your parents ever had difficulties with alcohol or other substances, or have any of them ever experienced psychological difficulties that compromised some aspect of their life functioning?

3. Have any of your aunts or uncles ever had difficulties with alcohol or other substances, or have any of them ever experienced psychological difficulties that compromised some aspect of their life functioning?

4. Have any of your siblings ever had difficulties with alcohol or other substances, or have any of them ever experienced psychological difficulties that compromised some aspect of their life functioning?

Educational Info.

1. What is your major and what type of degree are you seeking?

2. Are you planning or hoping to go on to graduate school?

3. What type of work or job would you like to have?

Hobbies/Extracurricular Activities

1. Are you a sports fan? Y/N

2. What sports do you watch?

3. Do you belong to any sports teams?

4. What sports do you engage in regularly or would you like to participate in?

5. Do belong to a gym?

6. Do you gamble?

7. Do you belong to any clubs?

8. Do you go to a church, a synagogue, a mosque, a temple or other places of worship? Do you do this here in Albany and/or in your hometown?

9. Are there any spiritual/religious practices you do privately e.g., pray etc?

10. What other activities do you like to engage in for fun and/or stress relief that you may not have mentioned? e.g. Shopping, Playing video games
Mentors

1. Do you have any mentors in your life, people who help or provide guidance for you personally or in your educational pursuits?

Efficacy

1. What do you think the chances are you will have another encounter with judicial affairs? 0-100% _______________%
2. Are you willing to make changes in your behavior so it doesn’t happen again? If so, how?

3. How many times do you have to try to change your behavior before you actually make a change?

Daily Monitoring Cards

We are just about done for today. I have one more topic to talk with you about. I would like to request that you monitor and record your drinking between now and the time we meet again. There really are several reasons why it helps to do this. First, and most importantly, it will help us both to get a better idea of how you drink. This information will be useful for us to look at when we meet again. In addition, people learn a lot about themselves when they actually take note of a particular behavior in this way. You may learn some things that you didn’t already know, or may clarify some things that you have already considered. What were your thoughts while I was telling you about this request?

1. An e-mail will be sent to you with this daily record coding system and the actual form. What I would like you to do is to hit the reply button each time you send your daily record, fill out the form using the codes, then delete the codes and then send it right back to us. Okay? Do you have any questions?
2. So the form will ask you to: Record date you drank, time am/pm from when to when did you drink, type of drinks, the amount you drank, where you were, with whom and how you were feeling. So each day from now until we meet again you should send a daily e-mail that records your drinking for each day. The days you don’t have any drinks just write the date and put no drinks or zero drinks.

3. It is best if you can do the recording as close to the time when you actually drank. It will take you a minute to do it and you can do it as part of your routine checking your messages. What do you think about that?

SET UP NEXT APPOINTMENT:

Approximately 10 days from initial meeting and there has to be at least 1 weekend between now and next visit

We finally come to the ending of our first meeting. I enjoyed meeting you and appreciated your openness here with me. We’ve covered a lot of ground today. Before I get you started on completing some additional questionnaires, I want to check in with you and find out from you whether you have any questions or thoughts about anything we talked about or didn’t get a chance yet to discuss?
Appendix B

Your Drinking Patterns
Frequency/Quantity
Blood Alcohol Content
Drinking Games

SPRING SEMESTER 2002

According to the information you gave us during the Spring 2003 semester, the number of occasions you drank (frequency) was approximately 3 times per month. You also reported that the average amount you drank on each occasion (quantity) was 3-4 drinks. Your typical BAL in this semester is from .086% when drinking beer and is considered a moderate level of intoxication. This amount of alcohol would take 3 hours to metabolize before you returned to a BAL of zero.

DRINKING NORMS

The actual drinking norm for adults your age is about twice a week, drinking at most 4 drinks on each occasion and this is based on nationwide statistics for college students.

<table>
<thead>
<tr>
<th>TIME</th>
<th>FREQUENCY</th>
<th>QUANTITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current Spring 2003</td>
<td>1 x per week</td>
<td>3 drinks ~3 drinks /wk</td>
</tr>
<tr>
<td>Estimated Norm</td>
<td>1-2 x / mth for females</td>
<td>1-2 drinks ~ 1-2 /wk</td>
</tr>
<tr>
<td>Actual Norm</td>
<td>1/wk</td>
<td>4 drinks ~ 4</td>
</tr>
</tbody>
</table>

DRINKING GAMES & REASONS for DRINKING

Drinking Games
You avoid or do not participate in drinking games.

Reasons for drinking
Major to Minor: makes socializing less boring, to celebrate, adds a warmth to social situation
RISKS

Alcohol Related Consequences

Family History    Dependence    Beliefs

ALCOHOL-RELATED CONSEQUENCES

From the information we gathered during the Spring 2003 Assessments you indicated that the following alcohol-related consequences had occurred:

- Referred to judicial affairs
- Been criticized by others
- Felt nauseated or vomitted

FAMILY HISTORY

From the information you gave, you are at a higher risk for alcoholism. Studies indicate higher rates of alcoholism are consistently found among family members of alcoholic persons. The rate of risk drops as the biological distance increases.

You reported no familial risks for abuse of drugs/alcohol.

INDICES OF ALCOHOL DEPENDENCE

In your personal interview you acknowledge the following experiences, which are associated with a pattern of dependence:

- None.

BELIEFS ABOUT ALCOHOL AND ITS EFFECTS

You listed the following alcohol effects as “NEUTRAL” and “SLIGHTLY AGREE will OCCUR” when you consume alcohol:

- I would be outgoing
- I would be sociable
- I would talkative.

You are not concerned about your drinking habits at this time. You perceive your risk for alcohol-related consequences as low.
Appendix C

TIPS

SPECIFIC TIPS TO DECREASE DRINKING
- AVOID drinking games or drinking for competition.
- Do a variety of fun things without drinking.
- If you are going to drink, always try to drink SLOWLY.
- Keep track of how much you drink.
- Space your drinks.
- Alternate alcohol drinks with water or soda.
- Drink for QUALITY rather than QUANTITY.
- Develop a plan ahead of time to handle yourself in heavy drinking situations.

FACTS

GENDER DIFFERENCES
- If women match drinks with males they are more likely to be 2x more intoxicated.
- Women have less water than men in their bodies and therefore alcohol is less diluted in women than men.
- Women have less gastric alcohol dehydrogenase (stomach enzyme) that helps to break down alcohol in the stomach. Therefore, women who are chronic alcohol abusers suffer with higher risks of liver cirrhosis, brain damage, and other health conditions.
- Hormonal changes in women can also affect your BAL. Specifically, 1 week prior to menstruating a woman has been found to maintain a peak or high longer than during or after menstruating. This is also true for those who take oral contraceptives.
- Male's report that while intoxicated they expect to feel more sexual, powerful and aggressive.
- Alcohol Myopia can affect males and females differently. It refers to a narrowing in your attention and a reduction in inferential processing. Intoxicated men may misperceive verbal and nonverbal cues as more sexual or that a woman is interested in having sex with him. While an intoxicated woman may not see how her friendly behavior is being misperceived as seductive and suggesting she is interested in sex.
- A woman has a decreased ability to resist verbally and physically any threats of sexual aggression.
The general misperceptions about an intoxicated woman are: she is sexually disinhibited, more open to seduction and more open to foreplay and any kind of sexually activity.

Men tend to initiate more sexual interactions with women who are intoxicated because of the perceptions about sexual receptivity.

Some men may attempt to purposely intoxicate a woman (buy more drinks, encourage drinking games) to increase her vulnerability.

### MYTH VS REALITY

<table>
<thead>
<tr>
<th>Myth</th>
<th>Reality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blackouts only happen to alcoholics</td>
<td>Blackouts can happen to anyone.</td>
</tr>
<tr>
<td>Coffee, cold showers, vomiting will decrease my BAL</td>
<td>Nothing but TIME WILL</td>
</tr>
<tr>
<td>Take Tylenol to stop from getting a headache combined</td>
<td>It could cause liver damage when with alcohol, wait until alcohol is out of your system.</td>
</tr>
<tr>
<td>Drinks do not kill brain cells</td>
<td>Drinks do not kill brain cells</td>
</tr>
<tr>
<td>Your brain is already developed by age 15 throughout so alcohol cannot stop or affect and future adulthood.</td>
<td>The brain continues to develop adolescents and well into early adulthood.</td>
</tr>
</tbody>
</table>

### DID YOU KNOW:

- In the past decade there has been a decrease in light drinking and an increase in heavy drinking on college campuses across the U.S.
- Five half billion dollars are spent per year by students on alcohol.
- Those who drink more than 5 drinks at a sitting are more likely to experience lower grades, miss classes, get behind in school work, have unplanned and unprotected sex.
- Those who drink on average 3 or less per week tend to receive A’s.
- The average student spends $250.00 per year on drinks.
- 23% of American College Students are high frequency/high-risk drinkers.
- 19% of American College Students are abstainers.
- 58% of American College Students drink but are non-high risk drinkers.
- 68% of alcohol drunk is by the high-risk drinkers.
Alcohol intoxication messes with your sleep and you may: fall asleep quicker, but wake up earlier; sleep more lightly; have a decrease in your deep, restful part of sleep; and heavy drinking will compromise your REM throughout the night.

During sleep alcohol affects your ability to process what you learned during the day into more solid memories (i.e. the studying you did during the day is dampened by the drinking you do later in the day or that night). It is during deep sleep that memories are more imbedded in the brain.

Alcohol intoxication interferes with your ability to problem solve, learn and remember things beyond just the night you drank.

MORE FACTS
Some you know and some you do not know

IMPORTANT INFORMATION ABOUT TOLERANCE TO ALCOHOL
Most people who drink on a regular basis have some degree of tolerance.
Many students view tolerance as a good thing (e.g., “I can drink MORE and not get sick,” or “I can hold my alcohol better than most”).
When you have a high tolerance peers tend to view you as ‘stronger’ or more ‘mature.’
One reward of tolerance is you have fewer negative SYMPTOMS but you have more NEGATIVE EFFECTS.
Tolerance DECREASES your experience of the peak positive effects.
Tolerance increases the amount you generally spend when you drink. It costs you more to drink than your friends who do not have a tolerance for drinking.
Without the natural warnings signals a tolerant person drinks more and can more easily become alcohol dependent.

BLOOD ALCOHOL CONTENT (BAC) INFORMATION:
< 0.05 BAC < 0.15
Can cause slowed motor function, hand/eye coordination, body sway, slow reaction, poor judgment, drowsiness, sleep problems, learning and memory difficulties.
> 0.15
Can cause exaggerated effects in all of the following: slowed motor function, hand/eye coordination, body sway, slow reaction, poor judgment, drowsiness, sleep problems, learning and memory difficulties, decrease in sexual functioning, vomit,
> 0.35
1/100 can die just from the effects that alcohol can have on there breathing - it can depress the breathing function.
June 29, 2004

Dear Fellow Research Participant,

Please find enclosed your last set of questionnaires similar to all those you have already filled out during your involvement in this research project. There is a return envelope, and a gift certificate enclosed as your final payment for your time and efforts. We would like to also remind you again that your questionnaire is very important to this study and we greatly appreciate all your efforts. Please fill the questionnaires out as soon as possible and mail it in the envelope provided. It should take you approximately 20 minutes.

Again, thanks so much for continued involvement in this research project and your efforts have been greatly appreciated. We wish you continued success in all your future endeavors. If you wish to have further information regarding this study please feel free to contact me at 856-7695. All the best to you.

Sincerely,

_____________________________
Kelly Horner, Ph.D. candidate
Psychology Department – Clinical Psychology Program
Student Input Research Project