2008

Alcohol use, negative consequences, and readiness to change in mandated and volunteer college student heavy drinkers before and after a brief alcohol intervention

Meredith A. Terlecki
Louisiana State University and Agricultural and Mechanical College

Follow this and additional works at: https://digitalcommons.lsu.edu/gradschool_theses

Part of the Psychology Commons

ALCOHOL USE, NEGATIVE CONSEQUENCES, AND READINESS TO CHANGE IN MANDATED AND VOLUNTEER COLLEGE STUDENT HEAVY DRINKERS BEFORE AND AFTER A BRIEF ALCOHOL INTERVENTION

A Thesis

Submitted to the Graduate Faculty of the
Louisiana State University and
Agricultural and Mechanical College
in partial fulfillment of the
requirements for the degree of
Master of Arts

in

The Department of Psychology

by
Meredith A. Terlecki
B.S., B.A., Lafayette College, 2003
May 2008

Table of Contents

Abstract

The current study tested the efficacy of a brief intervention designed to reduce alcohol use among high-risk college students who have been mandated to treatment for an alcohol policy violation relative to a brief wait-list control group and volunteer high-risk sample. Thirty-nine mandated students and forty high-risk student volunteers were randomly assigned to receive either a brief alcohol intervention or were assigned to a brief wait-list control (WLC) group. Participants were assessed at baseline and at a 4-week post-test on measures of alcohol consumption, alcohol-related problems, and readiness to change. Of the participants who had completed follow-up ($N = 39$), mandated and voluntary high-risk students who received the brief intervention reported significant reductions in alcohol consumption (drinks per week) and relative to the WLC. Mandated students who received the intervention also reported greater decreases in drinking occasions per week relative to the WLC. High-risk students who received the intervention reported decreases in alcohol use and drinking related-consequences, which were not significant by referral status. Preliminary results provide some support for the efficacy of brief motivational enhancement interventions for reducing drinking in high-risk college students who are mandated to treatment.

Introduction

Heavy episodic drinking in college students represents a "major public health concern" (USDHHS, 2000). The college-aged population reports the highest rate of alcohol use and consumes more alcohol compared to their non-college attending peers during their college years (Johnston et al., 2005). Heavy episodic or "binge" drinking has been defined by Wechsler and colleagues (Wechsler, Lee, Kuo, & Lee, 2002) as a man consuming over 5 drinks within two hours (4 for women), or exceeding a blood alcohol concentration (BAC) of 0.08%. About 44% of college students report drinking in this manner at least once in the last two weeks (Wechsler et al., 2002).

A significant percentage of college students who report "binge" drinking are likely to drink at levels that exceed the "binge" threshold up to three times (12/15 drinks) (White, Kraus, & Swartzweider, 2006). The pattern of heavy episodic drinking and high BAC has been consistently associated with high-risk and illegal behaviors including physical and sexual assault, property damage, and personal injury (Benton et al., 2006; Borsari et al., 2001; Engs & Aldo-Benson, 1995; Hingston, Heeren, Winter, & Wechsler, 2005; Hoover, 2004; Perkins, 2002; Mallett et al., 2006). Despite the known risks of heavy alcohol consumption and increased efforts to curtail risky drinking on campus, drinking patterns of college students have been relatively stable for the last two decades (Wechsler, 2002; Weingardt et al., 1998).

The Diagnostic and Statistical Manual for Mental Disorders, Fourth Edition (DSM-IV-TR: American Psychiatric Association, 1994) defines alcohol abuse as a maladaptive drinking pattern characterized by significant interferences with obligations, recurrent hazardous use of alcohol, or encountering significant social, legal, or interpersonal problems, without meeting the criteria for dependence. Alcohol dependence is defined as a maladaptive pattern of drinking that is characterized by tolerance, withdrawal, consuming more alcohol than intended, significant interferences with obligations, recurrent hazardous use of alcohol, significant social, legal, or interpersonal problems, and failure to cut down or stop drinking. About one-third of college students currently meet DSM-IV-TR defined criteria for alcohol abuse and 6% report symptom of alcohol dependence (Clements, 1999; Knight et al., 2001).

1

Alcohol misuse on college campuses is a concern because college students do not generally view their drinking as problematic. Fewer than 4% of students who meet DSM defined diagnostic criteria for alcohol abuse or dependence will voluntarily seek treatment (Clements, 1999; O'Hare, 1997). Most high-risk students are not identified until they experience a significant alcohol-related negative outcome (e.g., injury, arrest) and are brought to the attention of college or community officials. Because students are unlikely to self-refer to treatment, the university judicial system may be the most efficacious way to identify and intervene with high-risk college student drinkers (Barnett & Read, 2005). Excessive alcohol use and related problems are the most common reasons for disciplinary action and medical attention on college campuses (Bergen-Cico, 2000).

To combat problem drinking on campus, mandatory alcohol education (AE) for campus alcohol policy violators has become part of the disciplinary process (Anderson and Galadeto, 2001). Generally speaking, the goal of this approach is to educate problem drinkers and identify particularly high-risk students that come through the campus judicial system (Look & Rapaport, 1991; Sadler & Scott, 1993). Although this method might appear to be effective, it should be noted that few AE programs have been shown to consistently reduce alcohol consumption or alcohol-related negative outcomes, which are typically the goals of the program (Larimer & Cronce, 2002, 2007; Walters & Bennett, 2000). Most of the significant findings regarding AE programs have been limited to qualitative outcome measures such as estimates of behavior change and outcome measures that are unrelated to drinking behavior per se such as increases in alcohol-related knowledge (Walters & Neighbors, 2005). Despite the increased efforts to teach college students about the risks and consequences of drinking alcohol, risky alcohol use among college students is still dangerously high (Wechsler et al., 2002).

Borsari and Carey (2005) proposed that although college students may have become more knowledgeable about the consequences of risky drinking, they are still unmotivated to decrease their alcohol consumption. Therefore, intervention approaches developed for college settings should incorporate motivational enhancement strategies. The National Institute on Alcohol Abuse and Alcoholism (NIAAA) Task Force on College Drinking highlighted the brief motivational interview (MI)

as an encouraging approach to reduce college alcohol use (NIAAA, 2002). Several studies using MI intervention approaches with college student volunteers reported significant reductions in alcohol use, alcohol-related consequences, or both (Larimer & Cronce, 2002, 2007).

<u>Brief Motivational Interventions among College Students</u>

The Stages of Change model (Prochaska & DeClementi, 1992) supports the notion that behavior change is a process that occurs gradually through a series of five defined stages: precontemplation, contemplation, preparation, action, and maintenance (Prochaska, DiClemente, & Norcross, 1992). According to this model, most college student drinkers would be conceptualized as "precontemplators" (i.e., they do not see a reason to change their risky drinking behavior) (Vik, Cellucci, & Ivers, 2003). Ambivalence about change is a normative part of the change process and is consistent with the Stages of Change model. Miller & Rollnick (1991, 2002) argue that the key element to effective alcohol interventions is to resolve ambivalence about behavior change, help motivate the client to move through the stages, and strengthen the commitment for change using the following techniques: express empathy, support self efficacy, develop discrepancy (i.e., create and emphasize discrepancy between the current and desired behavior), and "roll with resistance" (i.e., meet the client's ambivalence and avoid argumentation for change).

MI may be particularly appealing to college students, who may not view their drinking as problematic or in need of change (Baer, Stacy, & Larimer, 1991). The non-confrontational style of MI appears to be a successful approach with students who may be defensive about their drinking and who may show resistance to being lectured about their drinking habits. MI may be more favorable to students than traditional methods because it avoids labeling people as having an alcohol "problem", incorporates personalized/family risk factors of alcohol use, and places the individual in a position to recognize his or her own need to change (Dimeff, Baer, Kivlahan, & Marlatt, 1999; White, 2006).

Another important component of alcohol interventions for college students is normative feedback on their peers' alcohol consumption. It has been well documented in the literature that perceived norms of alcohol consumption and alcohol-related consequences have a mediating effect on the quantity of

consumption among college students (Perkins & Wechsler, 1996). In 2005, Perkins, Haines, and Rice reported that a student's belief about the amount of alcohol consumed by his/her peers was the strongest predictor of alcohol consumption. This fact is concerning because college students typically overestimate the amount of alcohol consumption and number of alcohol related problems experienced by their peers, while underestimate the severity of alcohol-related consequences (Borsari & Carey, 2003). Furthermore, college students significantly overestimate the number of alcoholic beverages it takes to experience a serious alcohol-related consequence (e.g., black outs) (Mallett et al., 2006). Undergraduate students with the greatest misperceptions about the number of drinks needed to experience an alcohol-related consequence were also at the highest risk for heavy drinking (Mallett et al., 2006). It follows that changing students' perceptions of peer alcohol use via norms comparison techniques can be an important component of interventions designed to reduce risky alcohol use.

The Brief Alcohol Strategies and Intervention for College Students (BASICS) has been designated as a prototypical Tier 1 (i.e., the most effective individually-based) approach to reduce college drinking (Dimeff et al., 1999; NIAAA, 2002). The BASICS program combines the conceptual framework and objectives of a MI with cognitive-behavioral skills training and personalized normative feedback (PNF) within a harm reduction model, where the goal is not necessarily total abstinence but to decrease alcohol consumption (Dimeff et al., 1999). BASICS strategies attempt to motivate students to reduce risky drinking behavior and therefore avoid the harmful effects of heavy drinking (Dimeff et al., 1999; Marlatt et al., 1998). The BASICS intervention is conducted in two 50-minute sessions. The purpose of the first session is to assess the student's drinking behavior and provide some basic information on alcohol use (e.g., BAC). In the second session, the student is given graphic PNF about his/her drinking in relation to other students (norms comparison) and is given strategies to reduce risky drinking behavior. The PNF includes information on the student's drinking behavior in relation to other college students, an estimation of peak BAC, personal risk factors (e.g., family history of alcohol use disorders), and alcohol-related problems (Dimeff et al., 1999).

Controlled-outcome studies of BASICS have shown clinically significant reductions in alcohol use and alcohol-related consequences (Baer et al., 2001; Larimer et al., 2001; Roberts et al., 2000) in screened, high-risk college student drinkers with small to medium effect sizes (.21 to .48 for follow-up periods between 6-weeks and 2-years). Marlatt and colleagues (1998) randomly assigned incoming heavy drinking college freshmen to a brief in-person MI following the BASICS model or to an assessment-only (AO) control group. The interview included personalized information on alcohol use, consequences of heavy alcohol use, alcohol outcome expectancies, and campus norms comparisons. At follow-up, the BASICS group reported reductions in both alcohol use and alcohol-related consequences compared to the control group. These changes were maintained through the 2- and 4-year follow-up (Baer et al., 2001). Murphy and colleagues (2001) found that heavier drinking students who received a BASICS intervention reported greater reductions in their drinking compared to students who were randomly assigned to AE or to an AO control group. Borsari and Carey (2000) reported that college student binge drinkers who received a BASICS intervention reported significant reductions from baseline in their alcohol consumption at a 6-week follow-up.

Brief Motivational Interventions among Mandated College Students

In addition to student volunteers, students who are referred for a campus alcohol policy violation appear to be a critical target population for alcohol interventions. Mandated students may be at an increased risk for problematic alcohol use because they report heavier alcohol consumption and more alcohol-related negative problems (e.g., incidents of drinking and driving or blackouts) relative to campus norms (O'Hare, 1997; Clements, 1999), as well as lower grades, more heavy drinking days and alcohol-related consequences compared to their non-adjudicated heavy-drinking peers (Tevyaw O'Leary et al., 2004). Preliminary evidence indicates that brief alcohol interventions may be effective at decreasing alcohol consumption, alcohol-related negative consequences, or both in mandated students (Larimer and Cronce, 2002, 2007). Referring policy violators to a brief MI-style intervention may be a feasible strategy to reduce risky drinking, promote behavior change, and potentially help decrease alcohol-related disciplinary recidivism on college campuses (Larimer & Cronce, 2002). In order to incorporate

systematic brief alcohol interventions into the disciplinary process, more research is needed to evaluate their impact among mandated students.

Barnett and Read (2005) conducted a review of various intervention programs for mandated college students. The review included studies that met the following criteria: 1) participants were college students who were required to attend AE or counseling for an alcohol policy violation; and 2) post-intervention outcome measures were reported. Sixteen studies were identified in the following categories: single group post-test only studies ($n = 7$), single group studies with follow-up data ($n = 6$), and randomized control trials (RCT) ($n = 3$). The review considered studies that used various intervention programs (e.g., AE) but for purposes of this proposal only studies that employed an in-person MI and/or PNF are discussed.

Fisher-Potts (2002) conducted a group-based Alcohol Skills Training Program (ASTP: Baer et al., 1989) in mandated students. This particular study is discussed because the BASICS program (Dimeff et al., 1999) was developed from the ASTP and so the format of these programs is very similar, although ASTP may not traditionally be considered an MI-based approach. The intervention included a discussion on the risks and consequences of alcohol use along with PNF. At follow-up, the ASTP group decreased the number of heavy drinking days from relative to the AO comparison group. However, follow-up data was only collected for about 21% of the ASTP group. Furthermore, the follow-up period was not standardized and occurred anywhere from 3-39 months after the baseline assessment. Walters and colleagues (2001) conducted a 3-hour group-based AE program for first-time offenders that incorporated PNF about drinking patterns, alcohol problems, and risk level for each student. The initial sample size was small, but 66% of students completed the 8-week post-test ($n = 21$) and reported no differences in alcohol consumption, but reductions in peak BAC approached significance.

Two of three RCTs discussed in Barnett and Read's review utilized MI and PNF (see Borsari & Carey, 2005; Fromme & Corbin, 2004). Aside from these RCTs, most of the studies in this area have been more qualitative or quasi-experimental in nature, had small sample sizes, did not use control groups (i.e., single group post-test studies), did not use quantitative behavioral measures for alcohol use, had high

attrition rates, or short follow-up periods. Since the Barnett and Read review article was published, a few more RCTs using interventions including MI and/or PNF have emerged in the literature and are discussed below.

Barnett and colleagues (2004) randomly assigned mandated students to AE (using the CD-ROM, Alcohol 101) or BMI and to receive or not receive a 1-month booster session, which was a shortened format of the original intervention. At a 3-month follow-up, both groups significantly decreased their drinking frequency, frequency of heavy drinking, and drinking quantity. There were no differences between groups on alcohol use outcomes. However, significantly more participants in the BMI plus booster condition self-referred to counseling compared to the AE group (22% vs. 4%). Similarly, Borsari and Carey (2005) compared a BMI to AE in higher-risk students who were mandated to treatment for an alcohol policy infraction. At the 3- and 6-month follow-up meetings, students in the BMI condition reported significantly fewer alcohol related problems than the AE group. At a 6-month follow-up appointment, both groups showed significant decreases in heavy drinking episodes. The BMI group reported greater reductions in typical BAC. White and colleagues (2006) evaluated the efficacy of an in-person BMI to a written-PNF only condition in mandated students. At a 3-month follow up, both groups reported reductions in alcohol use and related problems.

Fromme and Corbin (2004) evaluated the Lifestyle Management Class (LMC), a group-based MI that included PNF and cognitive-behavioral skills to reduce risky alcohol use in a sample of voluntary and mandated college students. Students were randomly assigned to the LMC or to an AO control group (mandated students were assigned to a WLC group). At the 6-week post-test assessment, all groups significantly reduced drinking behavior. The LMC participants reported a significant decrease in instances of drinking and driving; yet, there was not a significant group by time interaction on measures of alcohol consumption or alcohol-related problems. However, participants who scored higher on a readiness to change (RTC) at baseline also reported greater decreases in alcohol consumption at the 6-week post-test. In other words, for participants higher in RTC, the intervention appeared to be more effective. Curiously, the LMC participants did not report an increase in RTC from baseline to post-test.

This finding is contrary to the notion that MI strategies help increase students' RTC and commitment to make subsequent behavioral changes. There appears to be a limitation in the literature on whether MI increases motivation and/or RTC. Overall, the researchers found the program comparably effective in both mandated and volunteer students.

Taken together, these studies suggest that mandated students may be receptive to MI-style alcohol interventions but it is unclear whether they sufficiently reduce alcohol-related harm in these students. The aforementioned RCTs are the most methodologically sound designs available in this literature; however, they have some limitations. For example, two studies included students who had violated the university's alcohol and/or drug policy (Fromme & Corbin, 2004; White et al., 2006). One study included only higher-risk, heavy drinking participants (Borsari & Carey, 2005). Another lacked a minimum drinking criteria (Fromme & Corbin, 2004), and one study incorporated a WLC group of mandated students in a group-based intervention (Fromme & Corbin, 2004), whereas the rest were individually-based treatment comparison studies (MI v. AE & MI v. PFB). Furthermore, the length of time to post-test/follow-up assessment and reported effect sizes differed by study. Borsari and Carey (2005) reported significant reductions of alcohol-related problems 6-months post-intervention (between group effect size = 0.39), White and colleagues (2006) reported decreases in number of drinks per week and alcohol-related problems within groups at a 3-month follow-up, but did not find differences between groups. Similarly, Barnett and colleagues (2004) did not find group differences in alcohol use or frequency of consumption at the three months post-test assessment. Fromme and Corbin (2004) also did not find an intervention effect on alcohol consumption, but did report decreased alcohol-impaired driving in the LMC group at the 6-week post-test, which disappeared by the 6-month follow-up. Lastly, the researchers found that the intervention was most effective for participants with the highest baseline RTC. It could be that RTC has an indirect effect on intervention response in mandated students; however, few studies have collected RTC measures.

Overall, the results from these studies raise some questions about the efficacy of brief interventions in mandated students. First, it is still unclear whether individually-based MI alcohol

8

interventions reduce alcohol consumption and related consequences in all mandated students, or only those students who are already highly motivated to change. Second, if the interventions are effective, it is unclear how long the intervention effect lasts in mandated students. Previous studies with student volunteers report behavioral changes through 2- and 4-year follow-ups (Marlatt, 1998), yet most studies with mandated students report little to no change at post-test, making it unclear if the intervention had any lasting effect on behavior. Third, the lack of adequate control groups in the individually-based intervention studies makes it difficult to separate the intervention effect from other factors (e.g., the effect of disciplinary action or naturalistic changes over time) (Barnett & Read, 2005; Campbell, 1969). Fromme & Corbin (2004) is a unique study that included a WLC group of mandated students. Women who had been assigned to the WLC group significantly reduced alcohol use from pre- to post-test, suggesting that the behavior change may have resulted from factors independent of the intervention (e.g., due the adversity of the event that resulted in disciplinary action or because students have been reprimanded and are being assessed/monitored) (Barnett et al., 2004). This particular finding highlights the importance of designing studies in a way to better control for potential historical, naturalistic, or maturational changes so that these effects are not misinterpreted as treatment outcomes.

In summary, interventions that follow a harm reduction approach and include MI techniques or PNF may have similarly positive effects in mandated students as in student volunteers. Preliminary findings support the idea that intervention approaches using MI and PNF are acceptable to mandated college students, preferable to traditional AE, and may have some lasting impact on behavior or cognitions concerning risky alcohol use. However, a criticism has been raised in the literature that harm reduction and MI may be fundamentally incongruent with mandated treatment and associated with poorer outcomes than in a nonmandated population.   Due to the limited number of longitudinal RCTs in this area, it is difficult to draw conclusions about the efficacy of a brief alcohol intervention in this critical population of high-risk college student drinkers. Further research addressing the effectiveness of MI alcohol interventions in mandated students is warranted (Larimer & Cronce, 2002; 2007). Mandatory

alcohol intervention programs may be a solution to help campus officials intervene with high-risk college student drinkers and combat heavy drinking on college campuses (Barnett & Read, 2005).

<u>Current Study</u>

The primary goal of the study is to further explore the conditions under which brief alcohol interventions may be effective among mandated college student drinkers. In order to design the most effective alcohol interventions for mandated students more information is needed about how they differ from never-mandated high-risk student volunteers in terms of drinking behavior and intervention response. Previous studies in this area have utilized inconsistent inclusion criteria to select high-risk comparison groups of college student volunteers. Because of the variability in the screening process, it is unclear if the mandated population as a whole drink more than voluntary students or whether the reported increases are better accounted for by the differential inclusion criteria between mandated and voluntary student groups. If identical inclusion criteria are used to select mandated students and student volunteers, it is not clear if the elevations in alcohol use and alcohol-related problems would be as large between the groups. The current study seeks to determine whether mandated students endorse more significant and pervasive alcohol use-related problems than student volunteers by using the same high-risk inclusion criteria for all study participants.

Another aim of the study is to determine if brief interventions are as efficacious in mandated students as in student volunteers. If mandated students do not appear to significantly decrease risky drinking behavior after receiving an individual brief alcohol intervention above and beyond the reductions that typically occur as a part of the disciplinary process then perhaps more cost-effective group-based or web-based interventions should be available for students and integrated into a the campus disciplinary system. However, if brief alcohol interventions appear to be equally effective in mandated as in voluntary students, then perhaps they may be a valuable addition to the campus referral process as a stand-alone treatment or as part of a stepped-care approach for handling alcohol policy violators (Breslin et al., 1999). The project attempts to contribute to the literature in this area by conducting a longitudinal

trial to assess the impact of a brief alcohol intervention in high-risk mandated students using a randomized, controlled design.

Hypotheses

Aim 1: In the available literature, there is limited descriptive information available on drinking behaviors in mandated students (Caldwell, 2002; O'Leary-Tevyaw et al., 2004). To determine if mandated students may endorse more pervasive and chronic alcohol-related problems and heavier drinking than student volunteers (i.e., never-mandated high-risk student volunteers), we evaluated baseline self-report measures of alcohol use, alcohol-related problems, and readiness to change in mandated and volunteer high-risk student drinkers. It is hypothesized that high-risk mandated students will report heavier weekly alcohol consumption, higher typical and peak alcohol consumption, more drinking days per week, more alcohol-related problems, and lower readiness to change than high-risk student volunteers.

Aim 2: To compare the immediate impact of a brief MI alcohol intervention in high-risk mandated students relative to no treatment (a WLC group) on outcome measures of typical weekly alcohol consumption, frequency of consumption, typical quantity per drinking occasion, peak drinks per occasion, alcohol-related consequences, and readiness to change. We hypothesize that the intervention group will report greater reductions in alcohol use and alcohol-related consequences relative to the WLC group. There will be no reported differences in readiness to change by group.

Aim 3: To evaluate the intervention's immediate impact among mandated and voluntary high-risk students on outcome measures of typical weekly alcohol consumption, frequency of consumption, typical quantity per drinking occasion, peak drinks per occasion, alcohol-related consequences, and readiness to change. It is hypothesized that high-risk mandated students and volunteers will report similar reductions in drinking and alcohol-related consequences post-intervention and greater decreases than the control groups.

11

Method

<u>Participants</u>

Full-time students enrolled at Louisiana State University (LSU) aged 18-24, were screened for high-risk alcohol use on internet-based self-report measures. Our high-risk criteria were determined based on recommendations in the literature and have been previously used in similar studies (see Baer et al., 2001; Marlatt et al., 1998). Students were eligible if they: a) reported drinking at least monthly and consumed at least 5 drinks per drinking occasion (4 drinks for women) in the past month as measured by the Daily Drinking Questionnaire (Collins et al., 1985) and Quantity/Frequency Index (Dimeff et al., 1999); b) endorsed three alcohol-related problems on 3 to 5 occasions in the past 3 years on the Rutgers Alcohol Problem Inventory (White & Labouvie, 1989); c) received a score greater than 6 on the Alcohol Use Disorders Identification Test (Saunders et al., 1993). The study was approved by the Louisiana State University's Institutional Review Board.

<u>Mandated Students</u>: Over two consecutive semesters, we screened all students who had committed at least one violation of LSU's campus alcohol policy (e.g., public drunkenness) and were referred to the Office of Judicial Affairs or Office of Residence Life at Louisiana State University (Summer 2007-Fall 2007). Mandated students who reported to drink alcohol at least monthly were invited to participate in the study ($n = 66$). Referred students were screened on internet-based self-assessment measures of high-risk alcohol use using the abovementioned inclusion criteria. Students who were not interested in participation ($n = 3$) filled out a research refusal form and were re-referred to the Office of Judicial Affairs. Mandated students who reported a prior alcohol or drug-related disciplinary referral ($n = 1$), requested more intensive treatment ($n = 1$), primarily used other substances (e.g., marijuana) ($n = 2$), or endorsed a history of severe and persistent alcohol related symptoms ($n = 1$) were excluded from participation and re-referred to the Office of Judicial Affairs. Excluded students were provided with appropriate treatment recommendations as determined by Amy Copeland, Ph.D., the primary advisor, Director of the LSU Psychological Services Center, and a licensed clinical psychologist with expertise in the treatment of addictive disorders (e.g., high risk students who met DSM-IV-TR

criteria for alcohol abuse or alcohol dependence would be referred to in- or out-patient therapy as deemed clinically appropriate). Students who chose not participate received treatment as usual [i.e., LSU's Tiger Education on Alcohol/Drug Matters class (TEAM) or were referred to the Student Mental Health Center for counseling] as determined by the Office of Judicial Affairs. Mandated students were deemed ineligible prior to being referred to the research program and did not sign consent forms or enroll in the longitudinal trial, therefore; the internet measures were not collected. The Deans of Judicial Affairs and Residential Life were consulted weekly to discuss the eligibility of mandated students.

All screened and eligible mandated students were invited to enroll in the longitudinal trial ($n = 58$). Students were told their participation was voluntary, data was confidential and would not be revealed to the Office of Judicial Affairs or Office of Residence Life, or used to influence disciplinary proceedings regarding their case. Participation through the post-test assessment fulfilled the mandatory alcohol intervention/alcohol education requirement. Students were given the option to end study participation at any point by filling out a research withdrawal form ($n = 0$). Students who wished to terminate their participation were told that they would be referred to treatment as usual (i.e., the TEAM class).

Student Volunteers (Aims 1 & 3): Student volunteers were recruited through the Department of Psychology's research participant pool and campus-wide advertising. Students who inquired about the research study ($n = 100$) were given a secure internet link to the screening measures via email. Volunteer students were screened for heavy drinking and alcohol-related consequences using the abovementioned high-risk criteria. In addition to those criteria, students who endorsed a previous alcohol-related infractions were excluded ($n = 5$). Sixty-seven volunteer students completed the screening measures. Sixty percent of screened students met the high-risk eligibility criteria ($n = 40$) and were invited to participate, which is much greater than other studies have reported. For example, Wechsler and colleagues (2000) used similar inclusion criteria and reported that 23% of screened volunteers met eligibility criteria. In our sample, most students were excluded because they did not meet inclusion criteria for alcohol use or cut-off scores on the RAPI and the AUDIT ($n = 22$).

There were no demographic differences between ineligible and eligible volunteer students on reported age [$t(65) = -.42, p = .67$], sex [$\chi^2(1) = 1.26, p = .26$], ethnicity/race [$\chi^2(5) = 4.96, p = .42$], class status [$\chi^2(1) = 1.75, p = .19$], Greek membership [$\chi^2(2) = .39, p = .82$], marital status (all participants were single), living arrangement [$\chi^2(4) = 5.94, p = .20$], or employment status [$\chi^2(4) = 4.95, p = .29$]. Twenty-nine student volunteers enrolled in the longitudinal trial. Students were most likely to decline participation because they did not have time ($n = 7$), were not interested ($n = 3$) or were blocked from enrolling in additional experiments ($n = 1$). Student volunteers were compensated for study participation with extra credit points through the Department of Psychology. Extra credit points were allocated based on the Department's regulations (1 point = 30 minutes of research participation). Students earned 6 extra credit points for study participation through the post-test.

Race and ethnicity endorsements were 71 Caucasian (89.9%), 4 Hispanic (5.1%), 3 African American (3.8%), and 1 American Indian (1.3%). Considering our sample size, the participants were representative of the ethnic makeup of LSU, which includes 1% American Indian, 5% African American, 4% Latino, and 90% Caucasian students.

Materials

Participants completed questionnaires at the Louisiana State University Psychological Services Center. The confidentiality of research data was assured with a Certificate of Confidentiality from the U.S. Department of Health and Human Services. Demographic information, family history, comprehensive effects of alcohol, and severity of alcohol dependence were collected only at baseline. Measures of the primary outcome variables (alcohol use, alcohol-related problems, and readiness to changes) were collected at the assessment interview and the post-test assessment.

Demographic Characteristics and Drinking History: Demographic information such as age, sex, ethnic background, height, weight, living arrangement, year in school, full-time/part-time enrollment status, Greek membership, previous alcohol-related citations, previous alcohol-use related treatment, date of sanction, and reason for sanction were collected via self-report during the assessment interview.

The Rutgers Alcohol Problem Inventory (RAPI; White and Labouvie, 1989): A 23-item self-report measure constructed to assess alcohol-related negative consequences. Students were asked to rate items on a 5-point Likert-scale to determine alcohol's role in their personal, social, and academic functioning, including frequency and severity of alcohol-related problems. Sample items include, "not been able to do homework or study for a test," "neglected responsibilities," "caused shame or embarrassment." This scale has been shown to be a reliable discriminator between clinical and normal samples of college age drinkers (White & Labouvie, 1989) and has demonstrated internal consistency in college students ($r = .92$) (Borsari & Carey, 2000). The measure is widely used to assess alcohol-related problems in this area of research (e.gs. Baer et al., 2001; Borsari & Carey, 2005; Marlatt et al., 1998; White et al., 2006) (see Appendix D).

The Daily Drinking Questionnaire (DDQ; Collins et al., 1985): A self-report measure used to assess both typical and heaviest weekly alcohol use. The measures asks the respondent to report the number of drinks typically consumed each day during the week as well as the time spent drinking each day during the last 3 months. Scoring produces three continuous measures of typical drinking and three measures for heavy drinking: the number of drinking days per week (frequency) and average drinks per drinking day (quantity per drinking occasion), and total drinks per week (frequency x quantity). One-week test-retest correlations have been calculated for estimates of typical drinking ($r = 0.93$; Collins, Carey, Sliwinski, 2002; Miller et al., 1998) and the measure has been evaluated for stability of reported drinking between baseline and 6-weeks for heaviest ($r = .82$) and typical drinking weeks ($r = .56$) by Borsari and colleagues (1999). The measure is commonly used alcohol research within the college-aged population (e.gs. Fromme & Corbin, 2004; Marlatt et al., 1998) (see Appendix E).

Quantity/Frequency/Peak Index (QFI; Dimeff et al., 1999): A self-report measure designed to assess a student's drinking behavior in terms of quantity and frequency of their alcohol consumption on a typical occasion and peak drinking occasion on a given occasion in the past month. The measure is commonly used in similar research studies (e.g., Baer et al., 2001; Collins, Carey, and Sliwinski, 2002; Dimeff et al., 1999) (see Appendix F).

15

The Readiness to Change Questionnaire (RCQ; Rollnick et al., 1992): A 12-item self-report measure assessing motivation to change based on Prochaska and DiClemente's stages of change model (see Appendix G).

The Stages of Change (SOC; Laforge et al., 1998): A single-item gender-specific self-report measure to determine stage of change for heavy episodic drinkers as based on Prochaska and DiClemente's model. The measure was developed and validated on college student drinkers (Laforge et al., 1998) to assess motivation to change heavy episodic drinking. This item asked, "In the last month have you had 5/4 or more drinks in a row?" Reponses reflect the stage of change: Precontemplation ("Yes, and I do not intend to stop drinking 5/4 or more drinks in a row"), contemplation ("Yes, but I intend to stop drinking 5/4 or more drinks in a row during the next six months"), preparation ("Yes, but I intend to stop drinking 5/4 more drinks in a row during the next 30 days"), and action ("No, but I have had 5/4 or more drinks in a row in the past 6 months"). Participants who endorsed the other answer options, "No, and I have not had 5/4 or more drinks in a row in the past 6 months" or "No, I have never had 5/4 or more drinks in a row" were not classified on stages of change (n = 1), which is a consistent analysis strategy in other published research studies that have utilized this measure (see Mallett et al., 2006) (see Appendix H).

The Alcohol Use Disorder Identification Test (AUDIT; Saunders, Aasland, Babor, De La Fuente, & Grant, 1993): A 10-item self-report measure developed by the World Health Organization (WHO) to identify current harmful and hazardous drinking (Babor, Higgins-Biddle, Saunders, & Monterio, 2001). The AUDIT is scored on a range from 0-40. An AUDIT cut-off score of 6 or greater demonstrates 91% sensitivity and 60% specificity in the detection of high-risk drinkers in a college sample (Kokotailo et al., 2004). The AUDIT is a unique alcohol screening instrument because it helps identify both high-risk drinking behavior and alcohol dependence (see Appendix I).

Alcohol Dependence Scale (ADS; Skinner and Horn, 1984): A widely used 25-item self-report measure designed to assess the severity of physical dependence symptoms (scores range from 0 to 47).

16

The reliability and validity of the ADS has been reported in alcohol treatment studies (Ross, Gavin & Skinner, 1990; Skinner & Allen, 1982; Skinner & Horn, 1984) (see Appendix J).

The Brief Drinker Profile (BDP; Miller and Marlatt, 1984): A structured interview designed to assess family history of alcohol problems, drug use history, smoking status, history of conduct disorder, and personal drinking history. The BDP is recommended for use in the BASICS assessment interview (Dimeff et al., 1999).

The Drinking Norms Rating Form (DNRF; Baer et al., 1991): A 10-item self-report instrument to assess a student's perception of alcohol use quantity and frequency among their peers. The assessment responses are a key component of the personalized graphic feedback and used as a tool to discuss perceptions of peer norms during the feedback interview (Dimeff et al., 1999) (see Appendix K).

Protective Behavioral Strategies Survey (PBSS; Martens et al., 2005): A 25-item self-report instrument assessing the extent to which students who engage in various cognitive-behavioral strategies designed to reduce harm associated with alcohol consumption (e.g., "Use a designated driver," "Know where my drink has been at all times"). The results of the assessment are used in the personalized graphic feedback (Dimeff et al., 1999) (see Appendix L).

The Comprehensive Effects of Alcohol (CEA; Fromme, Stroot, & Kaplan, 1993): A 38-item self-report measure that includes eight distinct positive and negative alcohol outcome expectancies (sample items include, "I would be more outgoing," "My body would feel relaxed," "It would be easier to talk to people"). The results are displayed in the personalized graphic feedback and discussed during the feedback interview (see Appendix M).

Alcohol Monitoring Cards (Dimeff et al., 1999): These are wallet size cards used to document daily drinking behavior. Each card includes basic instructions on how to record the type and quantity of alcohol consumed as well as columns for various situational and contextual factors to facilitate the documentation process (see Appendix N).

Procedure

     Screening. Screening measures consisted of collecting demographic characteristics, drinking rates, and alcohol-related problems on the Rutgers Alcohol Problem Inventory (White & Labouvie, 1989); the Daily Drinking Questionnaire (Collins et al., 1985); the Quantity/Frequency Index (Dimeff et al., 1999) (see Measures). The Alcohol Use Disorder Identification Test (Saunders et al., 1993) and Alcohol Dependence Scale (ADS; Ross, Gavin, & Skinner, 1990) were collected to screen for more pervasive alcohol use disorders including alcohol dependence.

     Eligible high-risk students were contacted by phone and/or email to schedule the baseline assessment meeting and the intervention. We used a series of reminder e-mails to achieve the sample size. Students who did not respond to e-mail were contacted by telephone. Mandated students who did not respond to the initial serious of e-mail and/or phone messages within a designated period (typically 3-5 business days, as determined by the Office of Judicial Affairs) were told that they would be referred back to the Office of Judicial Affairs for treatment as usual. Because study participation fulfilled disciplinary requirements for mandated students, we achieved a 100% participation rate for all interested and eligible students, which is slightly greater than the participation rate reported in previous studies. Fromme and Corbin (2004) achieved 52% participation, whereas Borsari and Carey (2005) attained closer to 88% through the first follow-up assessment with mandated students. For eligible student volunteers, we achieved a 72% participation rate, which is slightly lower than previous reports in the literature. Geisner, Neighbors, and Larimer (2007) achieved an 83% recruitment using a similar method with student volunteers.

     All students were randomly assigned to the BASICS intervention or to the control group (mandated students were assigned to a brief WLC) prior to the baseline assessment. Participants were randomly assigned a unique identifying number to locate their internet screening assessments. The number was linked to a file that was pre-assigned to treatment or control conditions using simple random assignment (e.g., coin toss) by a "blinded" research assistant before recruitment had started.

Baseline Assessment. Eligible high-risk participants who enrolled in the longitudinal RCT met individually with a trained graduate student (see Treatment Integrity) for approximately 50-minutes at the Louisiana State University's Psychological Services Center. The baseline assessments were conducted as follows:

1) Consent: explain informed consent form, random assignment, and confidentiality. Obtain written consent and agreement to be randomly assigned to immediate treatment or a control group.

2) Conduct the in-person structured interview: the Brief Drinker Profile (BDP; Miller & Marlatt, 1984).

3) Internet-based self-assessment: All participants were asked to complete internet-based self-report measures of alcohol use [the Daily Drinking Questionnaire (DDQ; Collins et al., 1985) and the Quantity/Frequency Index (QFI; Dimeff et al., 1999)]; alcohol-related problems [the Rutgers Alcohol Problem Inventory (RAPI; White and Labouvie, 1989); perceived norms of peer alcohol consumption [Drinking Norms Rating Form (DNRF; Baer et al., 1991)]; alcohol outcome expectancies [Comprehensive Effects of Alcohol (CEA; Fromme, Stroot, & Kaplan, 1993)]; a protective behaviors measure [Protective Behavioral Strategies Survey (PBSS; Martens et al., 2005)]; and readiness to change [Readiness to Change Questionnaire (RCQ; Rollnick et al., 1992) and Stages of Change (SOC; Laforge et al., 1998)].

4) Alcohol Monitoring Cards (Dimeff et al., 1999): Participants in the treatment condition were asked to keep track of their daily drinking for about 2 weeks (range: 10-18 days) prior to their scheduled intervention session using the alcohol monitoring cards provided by the interviewer.

5) Schedule appointment for feedback intervention or WLC assessment.

All measures except the BDP (Miller & Marlatt; 1984) were completed online using a secure web server. Online data collection was facilitated through an internet-based data collection service (hostedware.com), which has secure server software (SSL) and offers 32-bit encryption for secure data transfer. Online data collection was used to increase the ease of data entry and enable the production of

the graphic feedback utilized for the brief intervention and to reduce paperwork-burden and associated photocopying costs. There are several reasons we believe that the internet may be a particularly effective way to assess drinking among college students. First, internet-based assessment is cost effective (Moore, Soderquist, & Werch, 2005). Second, online data collection does not require additional data entry as all data is entered by study participants, thereby reducing data entry errors (Cloud & Peacock, 2001). Third, online screening studies and internet-based brief alcohol interventions have demonstrated acceptability and emerging efficacy (Kypri et al., 2004; Walters et al., 2005) for college students. Students were told that paper copies of the assessment measures were available if they were not comfortable disclosing personal information on the internet.

Intervention. The feedback intervention sessions were individually tailored based on the information collected during the assessment interview and baseline self-report measures. The feedback intervention involved a one-on-one review of the personalized graphic feedback (see Appendix B) consistent with the BASICS framework. The feedback interview was approximately 50 minutes. The intervention covered the following topics in each session: a) evaluation of typical drinking patterns as recorded on alcohol monitoring cards at the baseline assessment; b) comparison of typical patterns of alcohol use and perceived norms to actual campus norms of same-age peers; c) review of the biphasic effects of alcohol; d) personalized review of drinking consequences; and e) placebo and tolerance effects of alcohol. Participants received written information, tips, and strategies to reduce heavy drinking (Dimeff et al., 1999) and a wallet-sized BAC card (see Matthews & Miller, 1979) based on the participant's self-reported weight (see Appendix C). The interventions were conducted according to the MI guidelines (Miller & Rollnick, 1991; 2002) and delivered by trained graduate students (see Treatment Integrity) in clinical psychology following a written manual (Dimeff et al., 1999) and ongoing clinical supervision by Amy Copeland, Ph. D.

Treatment Integrity. Study interventionists were graduate students in clinical psychology. Study interventionists completed a two-day intensive BASICS training workshop at the University of Washington, Seattle. Student interventionists arranged to receive ongoing supervision (i.e.,

recommendations and feedback on intervention techniques) from Dr. Copeland who has received BASICS intervention training. Study interventionists and Dr. Copeland have arranged to receive extensive training in BASICS from Jason Kilmer, Ph.D. and Mary E. Larimer, Ph.D., from the Addictive Behaviors Research Center at the University of Washington, Seattle. Dr. Larimer was available for BASICS consulting and agreed to provide ongoing supervision to ensure treatment fidelity. All interventions will be coded for therapist adherence and competence in three dimensions: 1) actual time spent in intervention will be recorded; 2) therapists and trained coders will complete a checklist documenting which aspects (and how many total elements) of the intervention content were addressed in each session (Marlatt et al., 1998); 3) sessions will be coded for MI adherences and competence using the MI Treatment Integrity Scale (Moyers et al., 2005).

Post-Test Assessment. Students were asked to complete a series of internet-based post-test measures of alcohol use [DDQ (Collins et al., 1985) and QFI (Dimeff et al., 1999)]; alcohol-related problems (RAPI: White & Labouvie, 1989); and readiness to change [RCQ (Rollnick et al., 1992) and SOC (Laforge et al., 1998)]. Students were sent a secure link to the post-test measures via the email. Students were given reminders via email, phone, and/or other contacts that the student has provided to increase the study's follow-up rate. Students were typically sent email reminders to complete the post-test assessment at 7-, 3-, and 1-day prior to the assessment "due date."

To ensure that post-test and wait-list assessments were collected simultaneously (Aims 2 & 3), the WLC group completed the self-report measures 6-weeks[1] after the assessment interview and the BASICS group completed the measures 4-weeks after the feedback intervention. This period took into account a two-week period of self-monitoring between the assessment interview and the feedback interview for the BASICS group plus a four-week waiting period to the post-test assessment (see assessment timeline below). After the WLC group completed the assessment, they began two weeks of self-monitoring their alcohol use, received the feedback interview, and post-test.

---

[1] The study's wait-list period did not exceed the University's alcohol education class wait-list.

We consider the length of follow-up an important ethical concern since high-risk mandated students were assigned to a brief wait-list to receive the intervention and were briefly withheld treatment. One study used a similar wait-list control period for mandated students and reported no adverse events or exacerbated alcohol-use related symptoms in the wait-listed participants (see Fromme and Corbin, 2004). Some studies in the literature with student volunteers have longer follow-ups (e.g., Marlatt et al., 1998), but we did not wish to delay treatment. The WLC period did not exceed the wait-list period for treatment as usual (i.e., the TEAM class), so we believe mandated students were in no greater risk of experiencing alcohol-related harm than if they did not participate.

Since students are comfortable with computers and the internet, was convenient for them to do the internet based follow-up assessments without having to make an appointment at the clinic. One-hundred percent of the participants have completed the post-test up to this point in recruitment (representing 50% of the total sample). As recruitment continues, we expected 70-88% of our sample to complete the post-test, which has been reported by other similar studies (Borsari & Carey, 2005; Marlatt et al., 1998).

Volunteers who completed the post-test received extra credit points. Mandated students who completed the post-test were sent a research completion letter in the US mail. A copy of the letter was sent via campus mail to the Office of Judicial Affairs for the student's disciplinary record.

Table 1: Assessment Timeline (Aim 2 & 3).

Group	Baseline	Week 1	Week 2	Week 6	Week 7	Week 8	Week 12
BASICS	Assessment Interview	Self-monitor	Feedback Interview	4-week Post-test	-	-	-
WLC	Assessment Interview	-	-	WLC Assessment	Self-monitor	Feedback Interview	4-week Post-test

Data Analysis

Statistical Power and Sample Size Consideration

Power to detect differences was determined for the following principal outcome measures: 1) number of alcohol-related problems as reported on the Rutgers Alcohol Problem Inventory (White & Labouvie, 1989); 2) typical weekly alcohol consumption; 3) frequency of consumption; 4) typical quantity per drinking occasion; 5) peak drinks per occasion amount of alcohol consumed as reported on the Daily Drinking Questionnaire (Collins, Parks, & Marlatt, 1985) and Quantity/Frequency Index (Dimeff et al., 1999); 6) RTC as measured by the Readiness to Change Questionnaire (Rollnick, Heather, Gold, & Hall, 1992) and Stages of Change (Laforge et al., 1998). We based our analysis on a small to medium effect sizes (Cohen's $d = 0.20$), which is consistent with the literature (e.g., Marlatt et al., 1998).

Missing Data

We examined extreme values and variable distributions. Standardized scores were used to identify univariate outliers. Two individual cases were identified by extreme standardized scores ($z = 3.09$ and 3.02) as potential univariate outliers on alcohol use variables (drinks per week and typical quantity, respectively). Although these cases were extreme, they fell below the criteria used to determine univariate outliers ($z = 3.29$, $p < .001$) as recommended by Tabachnick & Fidell (2001) and were not removed from the data set. All variables were normally distributed and no data transformations were used to correct for extreme departures from normality. Linearity, homoscedasticity, and homogeneity of variance assumptions were evaluated before primary analyses were conducted. The researchers were sensitive to the issue of inflated experiment-wise effort rates and controlled these through modified Bonferroni methods (Holland & Copenhaver, 1988).

Potential attrition bias is an important aspect of missing data. We plan to test for attrition bias by evaluating whether baseline outcomes differ between dropouts and completers. At this preliminary stage, we have not lost any subjects to follow-up. Therefore, we did not adjust for any differences in our interpretation of the data.

Primary Statistical Analyses.

Aim 1: Descriptive Differences on Drinking Variables among High-Risk Mandated and Voluntary Students. To determine if there are preliminary descriptive differences on self-report measures of alcohol use, negative consequence, and readiness to change (RTC) in high-risk mandated and high-risk voluntary college student drinkers, we conducted one-way analyses of variance (disciplinary status: mandated and volunteer) for five primary outcome variables: 1) alcohol-related problems as measured by the RAPI (White & Labouvie, 1989); 2) typical weekly alcohol consumption; 3) frequency of consumption; 4) typical quantity per drinking occasion; and 5) peak drinks per occasion as measured by the DDQ (Collins et al., 1985) and QFI (Dimeff et al., 1999). We examined readiness to change as measured by the RCQ (Rollnick et al., 1992) and SOC (Laforge et al., 1998) categorically (precontemplation, contemplation, and preparation, and action) by group (mandated or volunteer) using a Chi-square analysis.

Aim 2: Immediate Intervention Effect in Mandated Students Relative to a Brief WLC. To assess the impact of the intervention among mandated students relative to a WLC group, we conducted five one-way analyses of variance on difference scores (pre- minus post-test scores on the primary outcome variables) by group (mandated BASICS and mandated WLC) on: 1) typical weekly alcohol consumption; 2) frequency of consumption; 3) typical quantity per drinking occasion; 4) peak drinks per occasion as measured by the DDQ (Collins et al., 1985) and QFI (Dimeff et al., 1999); and 5) alcohol-related consequences on the RAPI (White & Labouvie, 1989). Mandated participants who had completed follow-up assessments in the BASICS group ($n = 9$) and WLC ($n = 11$) were included in the primary analyses. A multivariate analysis of variance (see Marlatt et al., 1998) or analysis of covariance controlling for pre-test scores (see White et al., 2006) would have been preferable methods to examine this type of data. However, the current preliminary sample size is not appropriate for those analyses. In the future, general linear models for repeated measures will be developed to analyze these data. These models will employ unstructured covariance matrixes to allow study outcomes to be correlated across time points for each study subject.

For the primary analyses, difference scores were obtained for each primary dependent variable (weekly frequency, weekly quantity, peak drinks, typical drinks, alcohol-related problems, and readiness to change). Difference scores were calculated by subtracting the post-test score from the pre-test score on the variable of interest (e.g., pre-measure score minus post-measure score equals a new variable represented by MeasureChange). The primary outcome difference scores are as follows: RAPIchange is the difference in RAPI scores from pre- to post-test; QuantityChange is the difference in drinks per week from pre- to post-test as measured by the DDQ; FrequencyChange is the difference in drinking occasions per week as measured by the DDQ; PeakChange is the difference in the number of drinks consumed on a peak drinking night as measured by the QFI; TypicalChange was the number of drinks consumed on a typical drinking night as measured by the QFI.

To evaluate the impact of the intervention on readiness to change in mandated students, a Chi-Square was conducted between treatment conditions (BASICS v. WLC) on differences scores of the RCQ (Rollnick et al., 1992) and SOC (Laforge et al., 1998).

Aim 3: Immediate Intervention Effect in Mandated and Voluntary High-Risk Student Drinkers. To assess the impact of the intervention on mandated students relative to the WLC group, we conducted one-way analyses of variance by group (mandated BASICS and voluntary BASICS) on difference scores (pre- minus post-test scores) on five primary outcome measures: 1) typical weekly alcohol consumption; 2) frequency of consumption; 3) typical quantity per drinking occasion; 4) peak drinks per occasion as measured by the DDQ (Collins et al., 1985) and QFI (Dimeff et al., 1999); and 5) alcohol-related consequences on the RAPI (White & Labouvie, 1989). The analyses were conducted as for Aim 2. Mandated ($n = 9$) and voluntary ($n = 10$) students who had received the intervention and who had completed the post-test assessment were included in the primary analyses.

To evaluate the impact of the intervention on readiness to change in mandated students, a Chi-Square was conducted between treatment condition (BASICS v. WLC) on differences scores of the RCQ (Rollnick et al., 1992) and SOC (Laforge et al., 1998).

Results

Treatment Effect

To date, follow-up data is available for 39 participants ($N = 19$ treatment). Due to preliminary

sample size limitations, the effects of intervention on alcohol use and alcohol-related consequences over

time were examined using differences scores on primary outcome measures (as described in Data

Analysis) by group (treatment and control). There were significant differences reported from baseline to

post-test in weekly alcohol consumption $F(1,37) = 6.96$, $p = .012$, and drinking frequency per week

$F(1,37) = 5.86$, $p = .02$, between the conditions. The intervention group reported decreasing weekly

alcohol consumption by 7.32 drinks per week ($SD = 7.72$), whereas the control group decreased by 1.40

drinks per week ($SD = 6.23$). These results offer some evidence that the intervention may have had some

immediate effects on reducing alcohol use in high-risk college student drinkers (see Table 2).

Table 2
Means (standard deviations) of Difference Scores and Significance Tests by Treatment Assignment for
Primary Outcome Measures

| | | Significance | | |
Measures	Difference Score Mean (SD)	F	p	Effect Size (d)
Drinking				
Quantity		6.96	.01**	.16
Intervention	7.32 (7.72)			
Control	1.40 (6.23)			
Frequency		5.86	.02*	.14
Intervention	0.42 (1.02)			
Control	-0.40 (1.09)			
Typical Drinks		.004	.95	
Intervention	1.03 (3.78)			
Control	1.10 (3.64)			
Peak Drinks		1.12	.30	
Intervention	2.42 (4.69)			
Control	0.90 (4.28)			
Alcohol problems		.017	.89	
RAPI Score				
Intervention	10.0 (12.61)			
Control	9.55 (8.81)			

Notes: $N = 39$. Values represent the means (standard deviations) of differences scores on measures of alcohol use and alcohol related problems. RAPI = Rutgers Alcohol Problem Index. $F = F$ test for univariate analysis of variance. * $p > .05$, ** $p > .01$.

<u>Aim 1: Descriptive Differences on Drinking Variables among High-Risk Mandated and Voluntary Students</u>.

        <u>Baseline Comparisons</u>. Two-tailed *t*-tests and chi-square tests were conducted to determine whether baseline differences existed between mandated and voluntary students on demographic characteristics and drinking variables. These tests revealed significant differences on typical number of drinks per occasion, peak drinks per occasion, current Greek membership, and sex (see Table 3).

        A greater proportion of mandated students were males (85%) in comparison to the volunteer group (36%); these findings are consistent with the literature (Borsari & Carey, 2005; Fromme & Corbin, 2004; O'Hare, 1997; White et al., 2006). The high-risk volunteer student sample had a greater proportion of female students (65%) relative to university norms (58% female). The Louisiana State University Psychology Department's research subject pool is mainly comprised of upper level students in psychology who are more likely to be female. In our sample, female students reported drinking an average of 15.5 (SD = 9.7) drinks per week, whereas, male students reported drinking 22.2 (SD = 12.3) drinks per week. There was a significant main effect on weekly alcohol consumption by sex $F(1, 78) = 4.36, p < .04$; peak quantity by sex $F(1, 78) = 9.30, p < .003$; typical quantity by sex $F(1, 78) = 9.16, p < .003$; and the interaction between weekly alcohol consumption by sex and participant referral status (mandated or voluntary) was significant $F(1, 78) = 4.14, p < .04$. The sex difference by group is important to note because female drinkers typically consume less alcohol per typical occasion, per peak occasion, and per week than their male peers (Wechsler, 2002). It is common in the literature to control for sex and age (e.g., White et al., 2006) due to their strong relationship to higher alcohol consumption in the college-aged population (Bachman et al., 1997). However, due to the preliminary sample size, the differences in primary outcome variables for this aim were examined separately by sex so as not to confound the findings with sex differences between the groups.

        <u>Primary Analyses</u>. After evaluating baseline differences, five one-way analyses of variance were conducted to evaluate dependent measures of alcohol use (drinks per week, drinking frequency, typical quantity per occasion, peak quantity per occasion) and alcohol-related problems (RAPI score) by group

(volunteer and mandated). The data were examined separately by sex using dummy codes (females = 1; males = 2). There were no significant differences by referral status among females on baseline measures of alcohol use or alcohol-related problems.   There were significant differences between mandated ($n =$ 33) and voluntary ($n = 14$) male students on baseline measures of drinks per week, $F(1, 45) = 4.82$, p > .03, ($\eta^2 = .10$), and typical quantity approached significance $F(1, 45) = 3.05$, p < .08. Mandated male students reported to drink approximately 1.5 times more drinks per week (M = 25.06, SD = 13.12) as did the high-risk male volunteers (M = 16.85, SD = 7.17).

A chi-square analysis was used to evaluate baseline categorical differences in readiness to change as measured by the RCQ (Rollnick et al., 1992) and SOC (Laforge et al., 1998) by referral status (mandated and voluntary).   There were no significant differences between groups on measures of readiness to change (see Table 3). Students were primarily considered "precontemplators" among mandated (n = 30) and voluntary (n = 31) participants. Each group had one "contemplator." Six student volunteers and 5 mandated students were in the "preparation" stage at baseline, meaning they were taking active steps to reduce their drinking. No students endorsed being in the "action" stage at baseline. The preliminary results are consistent with the findings that most college students are "precontemplators" and do not see a reason to change their risky drinking behavior (Vik, Cellucci, & Ivers, 2003).

Aim 2: Immediate Intervention Effect in Mandated Students Relative to a Brief WLC.

Baseline Comparisons. Chi-square tests and *t*-tests were conducted to determine if there were baseline differences among mandated students by treatment condition (see Table 4). There were no significant differences by treatment assignment on demographic characteristics. Students in the WLC group reported drinking significantly more per typical occasion (M = 10.94, SD = 4.43) than the BASICS group (M = 7.21, SD = 3.42), $t(37) = $ -2.96, p < .01. However, no significant differences were reported on other alcohol use variables (i.e., peak drinks per occasion, weekly quantity, or frequency).   The BASICS group was 76% male and the WLC group was 94% male, but the difference was not significant. Nevertheless, males typically consume more drinks per occasion than females do (Wechsler, Dowell, Davenport, & Castillo, 1995).

Table 3

Demographic and Baseline Drinking Patterns for Mandated and Volunteer High-Risk Student Drinkers

VARIABLES	Mandated (n = 39)	Volunteer (n = 40)	Test statistic	*p*
Demographics				
Gender (Male)	85.0%	35.9%	$\chi^2(1) = 19.97$	.00***
Race (Caucasian)	92.5%	87.2%	$\chi^2(3) = 1.45$	.69
Residence (private off-campus)	72.5%	84.6%	$\chi^2(3) = 3.02$	.38
Age (years)	20.0 (1.65)	20.15 (1.53)	$t(77) = -.42$	.67
Greek membership (current)	46.2%	20.5%	$\chi^2(2) = 6.23$	.04*
Class	52.5% fresh/soph	38.5% fresh/soph	$\chi^2(1) = 1.57$	.21
Screening Variables				
AUDIT Score	14.05 (6.34)	11.85 (4.85)	$t(77) = 1.73$	.08
Drinking Variables				
Quantity (drinks per week)	23.13 (12.95)	16.75 (9.48)	$t(77) = 2.51$	.014*
Weekly Frequency	3.40 (1.33)	3.38 (1.46)	$t(77) = 0.49$	.96
Typical Drinks	8.94 (4.30)	6.40 (3.42)	$t(77) = 2.90$	.005**
Peak Drinks	12.06 (4.13)	9.40 (4.79)	$t(77) = 2.64$	.01**
Alcohol Related Problems				
RAPI Score	19.74 (15.39)	17.05 (11.31)	$t(77) = .88$	.37
Readiness to Change				
Readiness to Change Questionnaire (precontemplation)	66.7%	52.5%	$\chi^2(2) = 1.91$	.38
Stage of Change (precontemplation)	83.8%	82.1%	$\chi^2(2) = .05$	.97

Notes: Values represent percentages or original mean scores on measures of alcohol use, alcohol-related problems, and readiness to change. AUDIT = Alcohol Use Disorder Identification Test; RAPI = Rutgers Alcohol Problem Inventory. * *p* < .05, ** *p* < .01, *** *p* < .001.

The greater alcohol consumption per typical occasion reported by the WLC group could be attributable to the greater number of males in that group. The primary analyses for Aim 2 were not examined separately by sex as per Aim 1 due to sample size.

Primary Analyses. There were significant differences by group (intervention and wait-list control) among mandated students on measures of weekly alcohol consumption $F(1,18) = 4.68, p = .04, \eta^2 = .21$.

Table 4
Baseline Characteristics of Mandated Students Assigned to BASICS and a Wait-List Control (WLC)

VARIABLE	BASICS (n = 21)	WLC (n = 18)	Test statistic	p
Demographics				
Gender (Male)	76.2%	94.4%	$\chi^2(1) = .11$	.13
Race (Caucasian)	95.2%	88.9%	$\chi^2(2) = 1.21$	.54
Residence (private off-campus)	76.2%	66.7%	$\chi^2(3) = 1.75$	.63
Age (years)	20.14 (1.65)	19.83 (1.68)	$t(37) = .57$	.57
Greek membership (current)	57.1%	33.3%	$\chi^2(2) = 2.25$	.33
Class (Fresh/Soph)	52.4%	50.0%	$\chi^2(1) = .02$	.51
Screening Variables				
AUDIT Score	12.86 (6.81)	15.77 (5.54)	$t(37) = -1.45$	.15
Alcohol Use Variables				
Quantity (drinks per week)	22.52 (14.16)	23.83 (11.71)	$t(37) = -.31$	.76
Weekly Frequency	3.42 (1.28)	3.38 (1.46)	$t(37) = .09$	.93
Typical Drinks	7.21 (3.42)	10.94 (4.43)	$t(37) = -2.96$	.005**
Peak Drinks	11.21 (4.30)	13.05 (3.79)	$t(37) = -1.41$	.17
Alcohol Related Problems				
RAPI Score	15.81 (14.70)	24.33 (15.29)	$t(37) = -1.73$	.09
Readiness to Change				
Readiness to Change Questionnaire (precontemplation)	66.7%	66.7%	$\chi^2(2) = .66$	.72
Stage of Change (precontemplation)	90.0%	76.5%	$\chi^2(2) = 1.75$	.41
Reason for Referral				
Drunk in public (n)	5	1		
%	23.8	5.5		
In the presence of alcohol (n)	2	1		
%	9.5	5.5		
Emergency Room (n)	1	0		
%	4.8	0		
Underage Possession (n)	4	7		
%	19.0	38.8		
DUI (n)	2	2		
%	9.5	11.1		
Assault (n)	2	1		
%	9.5	5.5		
Alcohol to a campus event (n)	5	6		
%	23.8	33.3		

Notes: Values represent percentages or original mean scores on measures of alcohol use, alcohol-related problems, and readiness to change. AUDIT = Alcohol Use Disorder Identification Test; RAPI = Rutgers Alcohol Problem Inventory.* $p < .05$, ** $p < .01$.

Weekly drinking frequency approached significance $F(1,18) = 3.38, p = .08$. Students who received the intervention reported to decrease alcohol consumption by 9.89 (SD = 9.62) drinks per week whereas wait-listed students decreased weekly drinking by 1.27 (SD = 8.20) drinks per week. Mandated students who received the intervention reported to decrease drinking frequency by nearly one occasion per week relative to the WLC. There were no significant changes reported on measures of alcohol related problems (RAPI score change), peak alcohol consumption, and typical alcohol consumption by treatment condition. There were significant differences in readiness to change by condition.

Table 5
Means (standard deviations) of Difference Scores and Significance Tests for Primary Outcome Measures Among Mandated College Students Assigned to Treatment (mBASICS) ($n = 9$) or Control (mWLC) ($n = 11$)

| Measures | Difference Score Mean (SD) | Significance | | Effect Size (d) |
		F or χ^2	p	
Drinking		4.68	.04	.21
Quantity				
mBASICS	9.89 (9.63)			
mWLC	2.17 (8.18)			
Frequency		3.38	.08	.16
mBASICS	0.22 (1.09)			
mWLC	-0.73 (1.19)			
Typical Drinks		1.54	.23	
mBASICS	0.44 (2.96)			
mWLC	2.54 (4.29)			
Peak Drinks		.005	.95	
mBASICS	2.22 (3.66)			
mWLC	2.36 (5.20)			
Alcohol problems				
RAPI Score		.45	.51	
mBASICS	11.77 (16.02)			
mWLC	8.01 (7.83)	4.11		
Readiness to Change				
Increases			.05*	
mBASICS	33.3%			
mWLC	0%			

Note: Values represent the means (standard deviations) of differences scores on measures of alcohol use and alcohol related problems. RAPI = Rutgers Alcohol Problem Index. $F = F$ test for univariate analysis of variance. * $p > .05$.

Thirty-three percent of mandated students who had received the intervention reported increased readiness to change (i.e., moving from the "precontemplation" to the "contemplation" stage), whereas, mandated students assigned to the wait-list control reported no change, $\chi^2(2) = 4.11, p > .05$ (see Table 5).

<u>Aim 3: Immediate Intervention Effect in Mandated and Voluntary High-Risk Student Drinkers.</u>

      <u>Baseline Comparisons</u>. Baseline characteristics of mandated BASICS and volunteer BASICS students are shown (Table 3). Chi-square tests and *t*-tests were conducted to determine if there were baseline differences by disciplinary status among students who received the intervention and had completed the post-test (see Table 6). Significantly more mandated students were male and current members of the Greek system; however, there were no baseline differences on the primary outcome variables between mandated and voluntary students who had received the intervention. Due to the limited number of cases with follow-up data at this preliminary stage, the primary analyses were not broken down by sex as for Aim 1. However, our final data analysis plan will examine the data separately by sex so as not to confound the treatment effect with sex differences between the voluntary and mandated student groups.

      <u>Primary Analyses</u>. The one-way analyses of variance revealed no significant differences between mandated students and student volunteers who had received the BASICS intervention on primary outcome measures of alcohol use or alcohol-problems. Both groups reported significant decreases in weekly alcohol consumption and drinking frequency. Mandated students reduced weekly drinking by 9.89 (SD = 9.62) drinks per week, whereas, student volunteers reported to reduce weekly alcohol consumption by 5.00 (SD = 4.96) drinks. Both groups showed similar decreases in the number of drinking occasions per week (about 1 occasion less per week), consuming fewer drinks per peak occasion (about 2.5 drinks), and typical occasion (about 1 drink less). Both mandated students and student volunteers reported a decrease in alcohol-related problems as measured by the RAPI (White & Labouvie, 1989) by about 12 points and 8 points, respectively. A Chi-square test revealed no significant differences in readiness to change by group. Three mandated students (33% of completers) and two student

volunteers (18% of completers) reported to increase their readiness to change and move from

"precontemplation" to "contemplation" after receiving the intervention; whereas, no students in the

control groups reported increases in readiness to change.

Table 6
Characteristics of Mandated and Volunteer Students pre-BASICS Intervention

VARIABLE	mBASICS (n = 21)	vBASICS (n = 16)	Test statistic	p
Demographics				
Gender (Male)	76.2%	56.3%	$\chi^2(1) = 4.06$	.04*
Race (Caucasian)	95.2%	87.5%	$\chi^2(1) = 1.41$	.49
Residence (private off-campus)	76.2%	93.8%	$\chi^2(1) = 2.74$	.25
Age (years)	20.14 (1.65)	20.37 (1.78)	$t(37) = -.20$	.84
Greek membership (current)	57.1%	18.8%	$\chi^2(1) = 6.84$	.03*
Class (Fresh/Soph)	52.4%	43.8%	$\chi^2(1) = .27$	.43
Screening Variables				
AUDIT Score	12.86 (6.81)	13.31 (4.33)	$t(37) = -.23$	.82
Drinking variables				
Quantity (drinks per week)	22.52 (14.16)	16.43 (7.30)	$t(37) = 1.69$	.13
Weekly Frequency	3.42 (1.28)	3.56 (1.15)	$t(37) = -.33$	.75
Typical Drinks	7.21 (3.42)	6.63 (3.72)	$t(37) = .50$	.62
Peak Drinks	11.21 (4.30)	9.75 (5.31)	$t(37) = .93$	.36
Alcohol Related Problems				
RAPI Score	15.81 (14.70)	17.50 (9.56)	$t(33) = -.62$	.53
Readiness to Change				
Readiness to Change Questionnaire (precontemplation)	66.7%	62.5%	$\chi^2(1) = 2.02$	.36
Stage of Change (precontemplation)	90.0%	81.3%	$\chi^2(1) = 1.38$	.50

Notes: Values represent percentages or original mean scores on measures of alcohol use, alcohol-related problems, and readiness to change. AUDIT = Alcohol Use Disorder Identification Test; RAPI = Rutgers Alcohol Problem Inventory.* $p > .05$.

Discussion

Mandated and voluntary high-risk students who received the brief intervention reported significant reductions in alcohol consumption (drinks per week) and relative to the control groups. Mandated students who received the intervention also reported greater decreases in drinking occasions per week relative to the WLC. All students who received the intervention reported decreases in alcohol use and drinking related-consequences and there were no significant differences by referral group on these outcome measures. Preliminary results provide some support for the efficacy of brief motivational enhancement interventions for reducing drinking in high-risk college students who are mandated to treatment. Mandated students who received the intervention reported greater decreases in alcohol use (drinks per week) relative to the WLC, suggesting that the intervention helped reduce risky drinking above and beyond the changes associated with disciplinary action alone. Brief interventions may be an important component to the disciplinary process since mandated students reported to drink significantly more than their high-risk voluntary peers.

Aim 1: Descriptive Differences on Drinking Variables among High-Risk Mandated and Voluntary Students

There is considerable evidence in the literature that brief alcohol interventions are effective for high-risk student volunteers; however, relatively few RCTs have been conducted on the efficacy of brief alcohol interventions for students who have been required by their college to complete an alcohol intervention for an alcohol policy violation. Several studies have reported that mandated students' alcohol consumption exceeds university norms (Clements, 1999; O'Hare, 1997) and is more extreme than their selected high-risk peers (i.e., "drinking buddies") (O'Leary-Tevyaw in Barnett et al., 2006). The preliminary results from this study partially support the observation that mandated students consume significantly more drinks per week, more per typical occasion, more per peak occasion, on more occasions per week or endorse a greater number of alcohol-related problems than high-risk student volunteers. There were significant differences among high-risk male student volunteers and male mandated students in terms of weekly drinking, where mandated male students reported to drink about

34

150% more than male volunteers on a typical week. Furthermore, there was a trend for mandated males to drink more during a "peak occasion" than did male volunteers, which approached significance. The same trend was not evident for females, in fact, the high-risk volunteer sample reported drinking slightly more than the mandated females (16.28 and 12.50 drinks per week, respectively). This could be due in part to self-report issues such as resistance, hostility, or the effect of being mandated to an alcohol intervention program (Barnett et al., 2005). Fromme and Corbin (2004) reported that mandated females assigned to a WLC decreased alcohol consumption from pre- to post-test suggesting that the disciplinary process itself could be linked to behavioral change, self-report reactivity (e.g., underreporting), or perhaps promote female students' readiness to change. Due the small sample size of this preliminary study and power levels associated with the primary analyses, more data is needed to evaluate the significance of the observed trends.

There were differences between mandated students and student volunteers in terms of male sex and Greek membership, which are both are associated with heavier alcohol drinking and alcohol-related problems (Cashin, Presley, & Meilman, 1998; Engs & Hanson, 1990; Wechsler, Dowall, Davenport, & Castillo, 1995). The mandated student group had a greater number of current Greek members and male students relative to the volunteer group. Greek members, in particular, men living in a fraternity have been shown to drink more alcohol in terms quantity and frequency and report more alcohol-related problems than non-Greek members (Larimer et al., 2001; Wechsler et al., 1995). Fraternity members also report little concern about their drinking and low-motivation to change risky drinking behavior (Goodwin, 1989). However, the individuals in our mandated sample who reported to increases in readiness to change were upper-class fraternity members. Our preliminary findings are consistent with previous findings that fraternity members who receive a brief alcohol intervention report significant decreases in weekly alcohol consumption but relatively little change in alcohol-related problems (Larimer et al., 2001). To avoid potential sex differences between groups, similar intervention efficacy studies have randomly assigned participants to conditions based on sex (see Marlatt et al., 1998). This type of random assignment would reduce sex related differences in alcohol use among groups. Using this approach or

35

focusing exclusively on male students may reduce sex differences on alcohol use variables between

mandated students and student volunteer groups.

It should be noted that our high-risk sample of mandated and student volunteers reported drinking

more per week than had been previously reported in the literature. For example, Marlatt and colleagues

(1998) used similar drinking criteria to select a group of high-risk student volunteers for a BASICS

intervention and reported that high-risk drinkers consumed about 11 drinks per week at baseline, whereas

our sample of student volunteers reported nearly 17 drinks per week (56% more). However, Marlatt and

colleagues (1998) collected baseline data on incoming freshmen prior to the start of the students' first

semester in college and did not use the AUDIT measure (Saunders et al., 1993) to screen for alcohol use

disorders. Alcohol consumption and alcohol-related problems including alcohol dependence have a

strong, positive, linear relationship (Caldwell, 2002; Leibsohn, 1994; Montgomery & Hammerlie, 1993;

Schulenberg et al., 1996). It follows that the addition of a measure used to detect high-risk and

problematic drinking (e.g., the AUDIT) would be associated with greater alcohol consumption among

students who met the measure's high-risk criteria. Another possible explanation is the average age of our

sample (M = 20.7 years) was slightly higher than other studies in this area, especially those with incoming

freshmen. Drinking frequency has been found to steadily increase as students reach the age of 21 or 22

(Baer et al., 1992; Johnston et al., 2004). Fromme and Corbin (2004) did not use minimum drinking

criteria to select their sample of volunteer students (mean age 19.6 years) and reported that student

volunteers drank between 11.69-15.28 drinks per week, which is more comparable to our data. Overall,

our sample of high-risk student volunteers appears to be slightly higher than the values reported in the

literature.

We also observed greater than expected alcohol consumption within our sample of mandated

participants. Mandated participants in the present study reported consuming approximately 23 drinks per

week. Fromme and Corbin (2004) reported that their mandated sample drank 18.60-18.71 drinks per

week, however, no minimum drinking criteria were used which may have resulted in lower mean weekly

alcohol consumption. Borsari and Carey (2005) employed a higher cut-off score on the AUDIT (>10 vs.

6) to screen high-risk mandated students. They reported that heavy drinking mandated students consume between 18.10 and 19.22 drinks per week. The average age of our mandated sample was 20 years old, which is slightly higher than the age described by Fromme and Corbin (2004; M = 18.9 years) and Borsari and Carey (2005; M = 19.1 years). Thus, the greater alcohol consumption found in the present study could be due to the slightly older age of our participants who were approaching the "peak" phase of drinking that occurs around age 21 or 22 (Baer et al., 1992; Johnston et al., 2005).

The elevated weekly alcohol consumption observed in our sample could also be attributed to regional drinking differences in alcohol consumption and drinking pattern variability during the academic year (Greenbaum, del Boca, Darkes, Wang, & Goldman, 2005; Hilton, 1988). Since alcohol consumption among undergraduate students has been reported to peak at the beginning of the fall semester (Del Boca, Darkes, Greenbaum, & Goldman, 2004), it could be that we simply captured a heavy drinking phase on campus. However, baseline data was collected from July through November and so any major fluctuations in heavy drinking patterns among undergraduates would be expected to even out (i.e., regression to the mean) as recruitment continued. There were no differences in weekly alcohol consumption quantity by group per month, indicating that the drinking rate was fairly stable during the first few months of the fall semester.

Another potential reason for the high levels of drinking among study participants was the co-occurrence of football season with data collection at the sponsoring institution. On an anecdotal level, there were five home football games during the first two months of the fall semester. Activities including tail-gating before football games and other campus events (e.g., homecoming and pledging Greek membership), which often involve alcohol, may help to explain to greater alcohol consumption reported at the assessment interview (O'Hare, 1999). Consistent with this hypothesis, the percentage of alcohol infractions related to campus sporting events was high (26 of 40 incidents) in the mandated sample. To determine whether the reported levels of alcohol consumption on this campus are stable, recruitment will continue through the following spring semester.

Overall, given our small sample size, these emerging trends support other findings that mandated students, especially young, Caucasian, males involved in the Greek system, typically drink at levels that exceed university norms (Clements, 1999; O'Hare, 1997; Wechsler et al., 1996) as well as selected high-risk student volunteers (O'Leary-Tevyaw in Barnett et al., 2006). This study is unique in that it utilized identical inclusion criteria for both student volunteers and referred students to determine whether mandated students drink at higher and more dangerous levels than their high-risk peers; or whether they are comparable to other high-risk drinkers and simply ended up "in the wrong place at the wrong time." Given the findings, mandated students remain an important target group on campus for alcohol intervention programs. More research is needed to determine which programs are best suited for the mandated population of high-risk drinkers (Barnett & Read; 2005; Larimer & Cronce, 2002, 2007).

Aim 2: Immediate Intervention Effect in Mandated Students Relative to a Brief WLC

One previous study (see Fromme & Corbin, 2004) evaluated the impact of a group-based motivational alcohol intervention in mandated high-risk drinkers relative to a brief wait-list control group. Mandated female students assigned to the wait-list control group reported significant decreases in drinking behavior and most wait-listed students reported changes in drinking behavior similar to those receiving the intervention (Fromme & Corbin, 2004). There is preliminary evidence that brief interventions are effective for high-risk mandated students and most interventions appear to be comparably effective within this population (Barnett et al., 2004; Barnett & Read; 2005; Borsari & Carey, 2005; Fromme and Corbin, 2004; White et al., 2006). However, due to the limited use of research designs with no-treatment or wait-list control groups in this area make it difficult to determine whether behavioral changes are due to the impact of the intervention or if they are an artifact of being assessed, monitored, due to the disciplinary process, or the adversity of the event that lead to disciplinary action (Barnett and Read, 2005; Mallet et al., 2006; White et al., 2006).

The current study is the only study to the author's knowledge that evaluated an individually based brief MI among mandated students relative to a "true" control group. The addition of the WLC group in the current study is important because it helps determine whether the intervention is effective within the

intended population and whether the intervention may be associated with greater behavioral changes (e.g., decreased alcohol consumption) relative to other naturalistic, maturational, or historical changes (e.g., the effect of disciplinary action) which are believed to affect drinking behavior among mandated students (Barnett et al., 2006). Prior treatment comparison studies among mandated students have not been able to address this problem (Barnett & Read, 2005; Larimer & Cronce, 2002, 2007). The preliminary data provide some additional evidence that mandated students who receive a brief alcohol intervention report significantly greater decreases in weekly alcohol consumption and drinking frequency than mandated students who received no treatment. Other drinking variables such as typical and peak drinks per occasion remained relatively unchanged between the treatment assignments. There was a trend for mandated students who received the intervention to report greater decreases in alcohol related problems as measured by the RAPI (White & Labouvie, 1989); however, the difference was not significant between groups. Most intervention studies with mandated students have reported significant reductions in alcohol related problems among students assigned to a motivational intervention (Borsari & Carey, 2005; White et al., 2006).

Overall, the preliminary results from this study support the findings that mandated students assigned to a brief alcohol intervention or a wait-list control group report decreases in alcohol use post-intervention. These decreases could be due to variability in drinking patterns throughout the semester (Del Boca, Darkes, Greenbaum, & Goldman, 2004), the effect of being monitored or assessed (Barnett & Read, 2004), the adverse nature of the event leading to disciplinary action (Barnett et al., 2005), or self-report issues (e.g., reactivity). Previous researchers have suggested that self-monitoring or self-assessment of drinking behavior may alone act as an intervention (Fromme and Corbin, 2004; White et al., 2006). However, some of our data counters this hypothesis because we observed increases in drinking frequency per week in the wait-list control group and mandated students who received the intervention reported greater decreases in weekly drinking relative to the wait-list control group. Furthermore, there were no significant differences in alcohol use, alcohol related problems, or readiness to changes between the mandated WLC and the volunteer AO group. This may suggest that changes within the mandated

group were not necessarily due to the adversity of the disciplinary event or effect of disciplinary action, but may be due to drinking pattern variability during the semester (Del Boca, Darkes, Greenbaum, & Goldman, 2004).

We will continue to evaluate these hypotheses and have added several self-report measures that ask students to rate the adversity of the event leading to disciplinary action and ask them to reconstruct their drinking pattern 30-days prior to the event leading to disciplinary action as well as the date of the incidence up to the assessment interview. Furthermore, the WLC group will receive the intervention and complete the 4-week post-test after completing the WLC assessment. This design will provide a pseudo multiple-baseline comparison group for the study. If these students show significant reductions in alcohol use and alcohol-related problems at the 4-week post-test, then it can be said with more certainty that the behavioral changes are due to the effect of the intervention rather than drinking pattern variability or the effect of being assessed or monitored. These measures will help shed more light on the issue and address the concern that mandated students may significantly change their drinking behavior following the disciplinary incident.

Motivational enhancement interventions such as BASICS are thought to increase internal motivation to change risky drinking behavior (Dimeff et al., 1999; Miller & Rollnick, 1992). However, several studies have also reported other post-intervention behavioral changes including fewer alcohol-related problems without corresponding increases in readiness to change (Barnett et al., 2006; Larimer & Cronce, 2002, 2007; Mallett et al., 2006). Thus, it is unclear whether brief motivational enhancement techniques actually increase motivation to change. Few studies have examined readiness to change as a treatment moderator or independent outcome variable among college students who had not been assigned to a treatment condition (Fromme and Corbin, 2004). Fromme and Corbin (2004) is a unique study that included a WLC group to evaluate the effect of a group-based alcohol intervention among mandated student drinkers. The researchers reported that the MI was more effective for student drinkers who had high baseline motivation to change risky drinking. However, the intervention itself was not associated with increases in readiness to change from baseline to post-test. Although the current study is limited by

sample size, it does appear that the brief motivational enhancement intervention increases readiness to change. Both mandated and voluntary students reported significant increases in readiness to change from baseline to post-test relative to the control groups. However, the sample size of the present study is considerably small and therefore the results should be considered preliminary and interpreted with caution. As data collection progresses, we plan to evaluate whether increased readiness to change will moderate post-test decreases in alcohol use and related problems within the intervention group.

Aim 3: Immediate Intervention Effect in Mandated and Voluntary High-Risk Student Drinkers

Researchers have previously suggested that brief interventions may be fundamentally incongruent with mandated students and associated with worse outcomes due to potential issues with resistance and hostility. Brief alcohol interventions have been found to be effective in high-risk student volunteers (e.g., Borsari & Carey, 2001; Larimer et al., 2001; Marlatt et al., 1998) and preliminary evidence suggests that brief interventions may be equally effective among mandated students (e.g., Barnett & Read; 2004; Borsari & Carey, 2005; White et al., 2006). Fromme and Corbin (2004) incorporated both mandated students and student volunteers to evaluate a group-based lifestyle management class (LMC). The researchers reported that the LMC class was comparably effective between mandated and volunteer students at post-test. However, no minimum drinking criteria were used to select participants. Mandated students typically drink more than student volunteers (Clements, 1999) and may be more defensive about their drinking habits or resistant to change drinking behavior; however, it is still unclear as to whether defensiveness and resistance to change is related to referral status or external pressures to change risky drinking behavior among heavy drinkers (Cavaiola, 1984; Zonana & Norko, 1993).

The current study is unique because it used the same inclusion criteria for mandated students as student volunteers in attempt to screen for high-risk alcohol use in both groups. The present researchers were unable to find another study employing both high-risk mandated and voluntary students in an individually-based intervention program. It is currently unclear whether mandated and voluntary students respond differently to brief alcohol interventions, therefore, the present study attempted to address this question. The preliminary results from this study support the hypothesis that brief alcohol interventions

41

are comparably effective for high-risk mandated and voluntary students (Barnett & Read, 2004; Larimer & Cronce, 2002; 2007). Both groups showed similar decreases in weekly alcohol consumption, drinking occasions per week, typical drinks per occasion, peak drinks per occasion, and alcohol related problems (RAPI score). There were no significant differences on primary alcohol outcome measures between groups suggesting that mandated and voluntary high-risk students may have comparable benefits from the intervention. It should be noted that only mandated students were excluded due to reports of chronic or pervasive alcohol use disorders, previous inpatient treatment for alcohol use, and one student requested a more intensive program (e.g., outpatient treatment). Because these students were excluded from participation for ethical and clinical reasons, it appears that mandated students on a whole may endorse more significant alcohol-related problems relative to high-risk student volunteers. It could be that a stepped care approach, where mandated students are assigned to treatment based on individual characteristics and treatment history, may be more beneficial for this group of students as a whole (Breslin, Sobell, & Sobell, 2000).

Overall, the preliminary results of this study support the hypothesis that brief alcohol interventions are effective among mandated students for reducing alcohol consumption. Mandated students reported greater reductions in quantity of weekly alcohol consumption relative to the wait-list control and comparable reductions to a volunteer group of high-risk students. There are several potential strengths and limitations to the current research study. The strengths include random assignment to conditions, the use of standardized measures of alcohol use and alcohol-related problems, and internet assessment. Internet data collection is convenient, flexible, cost-effective, and can provide immediate feedback to participants based on their responses. Furthermore, data-entry errors are virtually eliminated as data is entered by participants. Research using computer-based and internet data collection have shown promising results with college students (e.g., Neighbors et al., 2004). Furthermore, the brief alcohol intervention is the most effective individually-based alcohol intervention for college students and has been recommended by the National Institute for Alcohol Abuse and Alcoholism to reduce risky alcohol use in college students (NIAAA, 2002).

Drawbacks and limitations include variance in times of assessments within the academic year and interventions across participants. Many participants were able to complete the assessments in private locations with internet access where some only have access to public campus computers (e.g., in libraries or at the clinic). Participants may have had concerns about confidentiality and data security over the Internet. While this concern could not be completely eliminated, participants were informed of extensive provisions to ensure confidentiality and security of their data, and also be asked to report from where (i.e., home, library) they accessed the survey. Previous research on college students has found no differences in reported alcohol use and alcohol-related problems among students randomized to take paper or online surveys (Miller et al., 2002). Furthermore, McCabe and colleagues (2002) found response rates were higher to web than mailed surveys, including among ethnic minority participants, with few students reporting concerns about web security.

Another concern with the validity of self-reported alcohol use by college students, especially among students who are mandated to alcohol interventions, may be concerns about confidentiality. Because confidentiality enhances the reliability and validity of self-report data (Babor et al., 1987; Darke, 1998), participants were reminded that all data are confidential. In addition to the discussion of protections for confidentiality referred to above, we acquired a Certificate of Confidentiality from the National Institute on Alcohol Abuse and Alcoholism as further protection of participant confidentiality. To help improve self-report validity, we considered the addition of collateral respondents or other external sources to verify the accuracy of self-report measures, however, some research indicates that self-report is more accurate (Borsari & Carey, 2005; Marlatt et al., 1998; Smith et al., 1995; Chermak et al., 1998) than collateral data. Borsari and Carey (2005) used collateral reports of alcohol use with mandated students and found a moderate correlation (rs ranged from .43 to .57) and most self-reports reported higher estimates than collaterals. These researchers found no significant differences between self-report and collateral reports that would indicate that mandated students systematically misinform researchers about their alcohol use. Self-report is also more cost-effective than collateral data, and the expense does not appear to be off-set by corresponding benefits (Babor et al., 2000; LaForge et al., 2005).

43

In addition, other non-self-report measures of alcohol use are not readily available or useful for assessing college drinking (e.g., biomarkers).

Another proposed limitation is participant attrition, which poses a significant problem to longitudinal research. At this point in the study, we have a perfect retention rate. However, we expect to have some attrition as the data collection continues. Reasons for participant attrition may include failure to follow-up due to residential instability, conflicting commitments, or lack of commitment. To facilitate retention, participants have been asked to update their contact information at each assessment, participants were given a standard form to update contact information, and they were asked to provide information for at least one person who could be contacted by the research staff.

An additional limitation of this study could be student interventionist training and staffing limitations. Studies using one primary interventionist run the risk of unintentionally biasing treatment delivery. All students met with a student interventionist for the assessment interview. The current design would be strengthened if the interventionists were blind to treatment condition and study hypotheses. To address this concern, we are currently planning to train additional research staff (i.e., graduate research assistants) to deliver the intervention. Another concern regarding the delivery of the intervention is that they were delivered by a trained graduate student (see Treatment Integrity) and not a doctoral level clinician. Although, previous studies have found no differences between peer- and professionally-lead interventions in terms of outcomes, independent raters found professionally-lead programs of higher-quality and greater treatment adherence (Fromme & Corbin, 2004). Several researchers support the idea of using master's-level students under supervision to facilitate intervention programs (Fromme & Corbin, 2004; Larimer & Cronce, 2002; 2007).

Lastly, behavioral changes may have occurred because the assessment interview itself may have an intervention effect in mandated students due to self-reporting and self-monitoring (Borsari & Carey, 2005). The design could be strengthened by having a control group that did not meet with the research team for the assessment interview. Other studies have suggested the use of no treatment control groups

with mandated students that utilize disciplinary fines, community service, or extended probation periods (Borsari & Carey, 2005; White et al., 2006).

In summary, it is still unclear whether historical or maturational factors may have contributed to the observed reductions in weekly alcohol use and so the results must be interpreted with caution. With that being said, this controlled study offers some preliminary evidence that mandated students may benefit from a brief motivational alcohol intervention in the same way as high-risk student volunteers despite the fact that their alcohol consumption and alcohol-related problems may be more significant than their high-risk peers. The present study attempted to contribute to the literature by employing more appropriate control groups (high-risk voluntary and WLC mandated students) to evaluate the immediate impact of a brief motivation intervention in high-risk mandated students on alcohol use, alcohol-related problems, and readiness to change. The initial results are promising despite the preliminary sample size.

Future research in this area should continue to evaluate brief motivational interventions among mandated students using similar randomized, controlled designs and with adequate control or comparison groups (e.g., extended WLC or disciplinary fine). The use of such designs will help determine how effective the brief motivational intervention may be for reducing risky alcohol use among high-risk mandated students relative to other treatments that may already be in place on college campuses (e.g., alcohol education). To evaluate how long the intervention effect lasts in mandated students, longer follow-up periods are recommended. Taken together, future directions in this area will help determine whether the cost of providing individually-based brief motivational interventions for alcohol policy violators will be off-set by meaningful reductions in problematic and risky alcohol use.

References

Anderson, D. S., & Gadaleto, A. (2001). *Results of the 2000 College Alcohol Survey: Comparison with 1997 results and baseline year*. Fairfax, VA: Center for the Advancement of Public Health, George Mason University.

Bachman, J. G., Wadsworth, K. N., O'Malley, P. M., Johnston, L. D., & Schulenberg, J. E. (1997). Smoking, drinking, and drug use in young adulthood: The impacts of new freedoms and new responsibilities. Research Monographs in Adolescence (RMA). Lawrence Erlbuam Associates, Inc., Publishers, Mahwah, NJ

Babor, T. F., Stephens, R. S., & Marlatt, G. A. (1987). Verbal report methods in clinical research and alcoholism: Report bias and its minimization. *Journal of Studies on Alcohol, 48*, 410-424.

Babor, T. F., & Higgins, J. C. (2000). Alcohol screening and brief interventions: Dissemination strategies for medical practice and public health. *Addiction, 95*, 677-686.

Babor, T. F., Higgins-Biddle, J. C., Saunders, J. B., & Monteiro, M. G. (2001). *The Alcohol use disorders identification tests - guidelines for use in primary care*. 2nd ed. World Health Organization, Geneva.

Baer, J. S., Kivlahan, D. R., Blume, A. W., McKnight, P., & Marlatt, G. A. (2001). Brief intervention for heavy drinking college students: 4-year follow up and natural history. *American Journal of Public Health, 91*, 1310-1316.

Baer, J. S., Kivlahan, D. R., Fromme, K., & Marlatt, G. A. (1989). A comparison of three methods of secondary prevention of alcohol abuse with college students. Preliminary results. In T. Loberg, W. R. Miller, G. A. Marlatt, & P. E. Nathan (Eds.), Addictive behaviors: Prevention and early intervention (pp. 157-171). Amsterdam: Swets & Zeitlinger.

Baer, J. S., Stacy, A., & Larimer, E. M. (1991). Biases in the perception of drinking norms among college students. *Journal of Studies on Alcohol, 52*, 580-586.

Barnett, N., & Read, J. P. (2005). Mandatory alcohol intervention for alcohol-abusing college students: A systematic review. *Journal of Substance Abuse Treatment, 29*, 147-158.

Barnett, N. P., Tevyaw, T. O., Fromme, K., Borsari, B., Carey, K. B., Corbin, W. R., Colby, S. M., & Monti, P. M. (2004). Brief alcohol interventions with mandated or adjudicated college students. *Alcoholism: Clinical and Experimental Research, 28*, 966-975.

Bergen-Cico, D. (2000). Patterns of substance use and attrition among first year college students. *Journal of First-Year Experience and Students, 12*, 61-75.

Borsari, B., & Carey, K. B. (2000). Effects of a brief motivational intervention with college student drinkers. *Journal of Consulting and Clinical Psychology, 68*, 728-733.

Borsari, B., & Carey, K. B. (2005). Two brief alcohol interventions for mandated college students. *Psychology of Addictive Behaviors, 19*, 296-302.

Breslin, F. C., Sobell, M. B., Sobell, L. C., Cunningham, J. A., Sdao-Jarvie, K., & Borsoi, D. (2000). Problem drinkers: Evaluation of a stepped-care approach. *Journal of Substance Abuse, 10*, 217-232.

Caldwell, P. E. (2002). Drinking Levels, related problems, and readiness to change in a college sample. *Alcoholism Treatment Quarterly, 20*, 1-15.

Campbell, D. T. (1969). Reforms as experiments. *American Psychologist, 24*, 409-429.

Carey, K. B., Corbin, W., Colby, S. M., & Monti, P. M. (Eds.), *Brief alcohol-interventions with mandated or adjudicated college students* (pp. 966-967). *Alcoholism: Clinical and Experimental Research, 28*, 966-975.

Cashin, J. R., Presley, C. A., & Meilman, P. W. (1998). Alcohol use in the Greek system: Follow the leader? *Journal of Studies on Alcohol, 58*, 63-70.

Cavaiola, A. A. (1984). Resistance issues in the treatment of the DWI offender. *Alcoholism Treatment Quarterly, 1*, 87-100.

Chermack, S. T., Singer, K., & Beresford, T. P. (1998). Screening for alcoholism among medical inpatients: How important is corroboration of patient self-report? *Alcoholism: Clinical and Experimental Research, 22*, 1393-1398.

Clements, R. (1999). Prevalence of alcohol-use disorders and alcohol-related problems in a college student sample. *Journal of American College Health, 48*, 111-118.

Cloud, R. N. and Peacock, P. L. (2001) Internet screening and interventions for problem drinking: Results from the www.carebetter.com pilot study. *Alcoholism Treatment Quarterly, 19*, 23–44.

Collins, R. L., Carey, K. B., & Sliwinski, M. J. (2002). Mailed personalized normative feedback as a brief intervention for at-risk college drinkers. *Journal of Studies on Alcohol, 63*, 559-567.

Collins, R. L., Parks, G. A., & Marlatt, G. A. (1985). Social determinants of alcohol consumption: The effects of social interaction and model status on the self-administration of alcohol. *Journal of Consulting and Clinical Psychology, 53*, 189-200.

Darke, S. (1998). Self-report among injecting drug users: A review. *Drug and Alcohol Dependence, 51*, 253-263.

Del Boca, F. K., Darkes, J., Greenbaum, P. E., & Goldman, M. S. (2004). Up close and personal: Temporal variability in the drinking of individual college students during their first year. Journal of Consulting and Clinical Psychology, 72, 155–164.

Dimeff, L. A., Baer, J. S., Kivlahan, D. R., & Marlatt, G. A. (1999). *Brief Alcohol Screening and Interventions for College Students: A harm reduction approach*. New York: Guilford Press.

Engs, R. C., & Aldo-Benson, M. (1995). The association of alcohol consumption with self-reported illness in university students. *Psychological Report, 76*, 727-736.

Engs, R. C., & Hanson, D. J. (1990). Gender differences in drinking patterns and problems among college students. A review of the literature. *Journal of Alcohol and Drug Education, 35*, 36-47.

Fromme, K., & Corbin, W. (2004). Prevention of heavy drinking and associated negative consequences among mandated and voluntary college students. *Journal of Consulting and Clinical Psychology, 72*, 1038-1049.

Fromme, K., Stroot, E., & Kaplan, D. (1993). Comprehensive Effects of Alcohol: development and psychometric assessment of a new expectancy questionnaire. *Psychological Assessment, 5*, 19-26.

Geisner, I. M., Neighbors, C., Lee, C. M., & Larimer, M. E. (2007). Evaluating personal alcohol feedback as a selective prevention for college students with depressed mood. Addictive Behaviors, 32, 2776-2787

Goodwin, L. (1989). Explaining alcohol consumption and related experiences among fraternity and sorority males. *Journal of College Student Development, 30*, 448-458.

Greenbaum, P. E., del Boca, F. K., Darkes, J., Wang, C. P., & Goldman, M. S. (2005). Variation in the drinking trajectories of freshmen college students. Journal of Consulting and Clinical Psychology, 73, 229-238.

Hilton, M. E. (1988). Regional diversity in United States drinking practices. *British Journal of Addiction, 83*, 519-525.

Hingston, R., Heeren, R., Winter, M., & Wechsler, H. (2005). Magnitude of alcohol-related mortality and morbidity among US college students ages 18-24: Changes from 1998 to 2001. *Annual Review of Public Health, 26*, 259-279.

Holland, B. S., & Copenhaver, M. D. (1988). Improved Bonferroni-type multiple testing procedures. *Psychological Bulletin, 104*, 145–149.

Hoover, E. (2004). Alcohol arrests on campuses increased again in 2002. *Chronicle of Higher Education, 50*, A33-A44.

Johnston, L. D., O'Malley, P. M., Bachman, J. G., & Schulenburg, J. E. (2005). Bethesda, MD: *Monitoring the Future: National Survey Results on Drug Use*, 1975-2004, Vol. 2, NIH Publication No. 05-5728. Bethesda, MD: Department of Health and Human Services, 2005.

Knight, J. R., Wechsler, H., Kuo, M., Seibring, M., Weitzman, E. R., & Schuckit, M. A. (2002). Alcohol abuse and dependence among U.S. college students. *Journal of Studies on Alcohol, 63*, 263-270.

Kokotailo, P. K., Egan, J., Gangnon, R., Brown, D., Mundt, M., & Fleming, M. (2004). Validity of the Alcohol Use Disorders Identification Test in College Students. *Alcoholism: Clinical and Experimental Research, 28*, 914-920.

Kypri, K., Stephenson, S., Langly, J. (2004). Assessment of non-response bias in an Internet survey of alcohol use. *Alcoholism: Clinical and Experimental Research*, 28, 4, 630-634.

Laforge, R. G., Borsari, B., Baer, J. S. (2005). The utility of collateral informant assessment in college alcohol research: Results from a longitudinal prevention trial. *Journal of Studies on Alcohol, 66*, 479-487.

Larimer, M. E., Turner, A. P., Anderson, B. K., Fader., J. S., Kilmer, J. R., Palmer, R. P., Cronce, J. M. (2001). Evaluating a brief alcohol intervention with fraternities. *Journal of Studies on Alcohol, 62*, 370-380.

Larimer, M. E., & Cronce, J. E. (2002). Identification, prevention and treatment: a review of individual-focused strategies to reduce problematic alcohol consumption by college students. *Journal of Studies on Alcohol, Supplement No. 14*, 148-163.

Larimer, M. E., & Cronce, J. E. (2007). Identification, prevention and treatment revisited: Individual-focused college drinking prevention strategies 1999-2006. *Addictive Behaviors, doi:10.1016/j.addbeh.2007.05.006*

Leibsohn, J. (1994). The relationship between drug and alcohol use and peer group associations of college freshman as they transition from high school. Journal of Drug Education, 24, 177-192.

Look, S., & Rappaport, R. J. (1991). Evaluation of an alcohol education discipline program for college students. *Journal of Alcohol and Drug Education, 36*, 88-95.

Mallett, K. A., Lee, C. M., Neighbors, C., Larimer, M. E., & Turrisi, R. (2006). Do we learn from our mistakes? An examination of the impact of negative alcohol-related consequences on college students' drinking patterns and perceptions. Journal of Studies on Alcohol, 67, 269-276.

Marlatt, G. A., Baer, J. S., Kivlahan, D. R., Dimeff, L. A., Larimer, M. E., & Quigley, L. A. (1998). Screening and brief intervention for high-risk college student drinkers: Results from a 2-year follow-up assessment. *Journal of Consulting and Clinical Psychology, 66*, 604-615.

Martens, M. P., Ferrier, A. G., Sheehy, M. J., Corbett, K., Anderson, D. A., & Simmons, A. (2005). Development of the Protective Behavioral Strategies Scale. *Journal of Studies on Alcohol, 66*, 698-705.

McCabe, S. E., (2002). Gender differences in collegiate risk factors for heavy episodic drinking. *Journal of Studies on Alcohol, 63*, 49-53.

Miller, W. R., & Rollnick, S. (1991). *Motivational interviewing: Preparing people to change addictive behavior*. New York: Guilford Press.

Miller, W. R., & Rollnick, S. (2002). *Motivational interviewing: Preparing people to change addictive behavior*. 2nd ed. New York: Guilford Press.

Miller, W. R., & Marlatt, G. A. (1984). *Brief Drinker Profile*. Odessa, FL: Psychological Assessment Resources.

Miller, B. E., Miller, M. N., Verhegge, R., Linville, H. H., Pumariega, A. J., (2002). Alcohol misuse among college athletes: self-medication for psychiatric symptoms? Journal of Drug Education, 32, 41-52.

Montgomery, R. L., & Haemmerlie, F. M. (1993). Undergraduate Adjustment to college, drinking behavior, and fraternity membership. *Psychological Report, 73*, 801-802.

Moore, M.J., Soderquist, J. & Werch, C. (2005). Feasibility and efficacy of a binge drinking prevention intervention for college students delivered via the Internet versus postal mail. *Journal of American College Health, 54*, 38-44.

Moyers, T., Martin, T, Manuel, J., Hendrickson, S., Miller, W. (2005). Assessing competence in the use of motivational interviewing. *Journal of Substance Abuse Treatment, 28*, 19-26.

Murphy, J. G., Duchnick, J. J., Vuchinich, R. E., Davidson, J. W., Karg, R. S., Olson, A. M., Smith, A. F., & Coffey, T. T. (2001). Relative efficacy of a brief motivation intervention for college student drinkers. *Psychology of Addictive Behaviors, 15*, 373-379.

Murphy, J. G., Benson, T. A., Vuchinich, R. E., Deskins, M. M., Flood, A. M., McDevitt-Murphy, M. E., & Torrealday, O. (2004). A comparison of personalized feedback for college student drinkers delivered with and without a motivational interview. *Journal of Studies on Alcohol, 65*, 200-203.

Neighbors, C., Larimer, M. E., & Lewis, M. A. (2004). Targeting misperceptions of descriptive drinking norms: Efficacy of a computer-delivered personalized normative feedback intervention. *Journal of Consulting and Clinical Psychology, 72*, 434-447.

O'Hare, T. (1997). Measuring excessive alcohol use in college drinking contexts: The Drinking Context Scale. *Addictive Behaviors, 22*, 469-477.

O'Neil, S. E., Parra, G.R., & Sher, K.J. (2001). Clinical relevance of heavy drinking during the college years: Cross-sectional and prospective perspectives. *Psychology of Addictive Behaviors, 15*, 350-359.

Perkins, H. W., Haines, M., & Rice, R. (2005). Misperceiving the college drinking norm and related problems: A nationwide study of exposure to prevention information, perceived norms, and student alcohol misuse. *Journal of Studies on Alcohol, 66*, 470-478.

Perkins, H. W. & Wechsler, H. (1996). Variation in perceived college drinking norms and its impact on alcohol abuse: A nationwide study. *Journal of Drug Issues, 26*, 961-974.

Presley, C. A., & Pimentel, E. R. (2006). The Introduction of the heavy and frequent drinker: a proposed classification to increase the accuracy of alcohol assessments in postsecondary educational settings. *Journal of Studies on Alcohol, 67*, 324-331.

Prochaska, J. O., & DiClemente, C. C. (1994). The Transtheoretical Approach: Crossing Traditional Boundaries of Therapy. Krieger, Malabor, FL.

Prochaska, J. O., DiClemente, C. C., & Norcross, C. (1992). In search of how people change: Applications to addictive behaviors. *American Psychologist, 47*, 1102-1114.

Riccelli, C. (1985). STOP: An early intervention program for problem drinkers. *Journal of American College Health, 34*, 134-137.

Roberts, L. J., Neal, D. J., Kivlahan, D. R., Baer, J. S., & Marlatt, G. A. (2000). Individual drinking changes following a brief intervention among college students. Clinical significance in an indicated preventive context. *Journal of Consulting and Clinical Psychology, 68*, 500-505.

Rollnick, S., Heather, N., Gold, R., & Hall, W. (1992). Development of a short "Readiness to Change Questionnaire" for use in brief opportunistic interventions among excessive drinkers. *British Journal of Addictions, 87*, 743-754.

Ross, H., Gavin, D., & Skinner, H. M. (1990). Diagnostic validity of the MAST and the alcohol dependence scale in the assessment of DSM-III alcohol disorders. *Journal for Studies on Alcohol, 51*, 506-513.

Sadler, O. W., & Scott, M. A. (1993). First offenders: A systematic response to underage drinking on the college campus. *Journal of Alcohol and Drug Education, 38*, 62-71.

Saunders, J. B., Aasland, O. G., Babor, T. F., De La Fuente, J.R., & Grant, M. (1993). Development of the Alcohol Use Disorders Identification Test (AUDIT). WHO collaborative project on early detection of persons with harmful alcohol consumption. *Addiction, 88*, 791-804.

Schulenberg, J. E., O'Malley, J. P., Bachman, J. G., Wadsworth, K. N., & Johnston, L. D. (1996). Getting drunk and growing up: Trajectories of frequent binge drinking in the transition to young adulthood. *Journal of Studies on Alcohol, 53*, 289-304.

Skinner H. A. & Allen B. (1982). Alcohol dependence syndrome. *Journal of Abnormal Psychology, 91*, 199-209.

Skinner, H. A., & Horn, J. J. (1984). *Alcohol Dependence Scale (ADS): Users Guide*. Toronto, Canada: Addiction Research Foundation.

Smith, G. T., McCarthy, D. M., Goldman, M. S. (1995). Self-reported drinking and alcohol-related problems among early adolescents: dimensionality and validity over 24 months. *Journal of Studies on Alcohol, Supplement, 14*, 54-70.

Tabachnick, B. G., & Fidell, L. S. (2007). *Using Multivariate Statistics (5th edition)*. Needham Heights, MA: Allyn & Bacon.

Tevyaw, T. O., Monti, P. M., & Colby, S. M. (2004). Differences between mandated college students and their peers on alcohol use and readiness to change. In N. P. Barnett, T. O. Tevyaw, K. Fromme, B. Borsari, K. B. Carey, W. R. Corbin, S. M. Colby, & P. M. Monti. Brief Alcohol Interventions with Mandated or Adjudicated College Students. Alcoholism: Clinical and Experimental Research, 28, 966-975.

U.S. Department of Health and Human Services. (2002). *A call to action: Changing the culture of drinking at U.S. colleges*. Task Force of the National Advisory Council on Alcohol Abuse and Alcoholism, National Institute on Alcohol Abuse and Alcoholism, National Institutes of Health (NIH Publication No. 02-5010).

Vik, P. W., Cellucci, R., & Ivers, H. (2003). Natural reductions of binge drinking among college students. *Addictive Behaviors, 28*, 643-655.

Walters, S. T., & Bennett, M. E. (2000). Addressing drinking among college students: A review of the empirical literature. *Alcoholism Treatment Quarterly, 18*, 61-77.

Walters, S. T., & Neighbors, C. (2005). Feedback interventions for college alcohol misuse: What, why, and for whom? *Addictive Behaviors, 30*, 1168-1182.

Wechsler, H., Dowdall, G. W., Davenport, A., & Castillo, S. (1995). Correlates of college student binge drinking. *American Journal of Public Health, 85,* 921-926.

Wechsler, H., Lee, J. E., Kuo, M., & Lee, H. (2002). Trends in college binge drinking during a period of increased prevention efforts. *Journal of American College Health, 50,* 203-217.

Wechsler, H., & McFadden, M. (1979). Drinking among college students in New England. *Journal of Studies on Alcohol, 40,* 969-996.

Wechsler, J., Lee, J. E., Kuo, M., & Lee, H. (2000). College Binge Drinking in the 1990s: A continuing problem. *Journal of American College Health, 48,* 199-210.

Weingardt, K. R., Baer, J. S., Kivlahan, D. R., Roberts, L., Miller, E. T., & Marlatt, G. A. (1998). Episodic heavy drinking among college students: Issues and longitudinal perspectives. *Psychology of Addictive Behaviors, 12,* 155-167.

White, A. M., Kraus, C. L., & Swartzweider, H. S. (2006). Many college freshmen drink at levels far beyond the binge threshold. *Alcoholism: Clinical and Experimental Research, 30,* 1006-1010.

White, H. R. (2006). Reduction of alcohol-related harm on United States college campuses: the use of personal feedback interventions. *International Journal of Drug Policy, 17,* 310-319.

White, H. R., & Labouvie, E. W. (1989). Towards the assessment of adolescent problem drinking. *Journal of Studies on Alcohol, 50,* 30-37.

Wood, M. D., Sher, K. J., & McGowan, A. K. (2000). Collegiate alcohol involvement and role attainment in early adulthood: Findings from a prospective high-risk study. *Journal of Studies on Alcohol, 61,* 278-289.

Zonana, H. & Norko, M. A. (1993). Mandated treatment. In W. H. Sledge & A. Tasman (Eds.), Clinical challenges in psychiatry (pp. 249-291). Washington, DC: American Psychiatric Publishing.

Consent for Initial Assessment, Feedback Interview, Post-Test, and Follow-Ups

Study Title: Differences in mandated and never-mandated college students' drinking behavior.

Performance Sites: This study will be conducted at the Louisiana State University Psychological Services Center (PSC), 33 Johnston Hall.

Contacts: The Principal Investigator, Amy L. Copeland, Ph.D., can be reached at 225-578-4117, Monday-Friday between 9:00 a.m. and 5:00 p.m. Additional research staff can be contacted at 225-578-1494, M-Th between 8:00 a.m. and 8:00 p.m. and Friday between 8:00 a.m. and 4:30 p.m.

Purpose of the Study: The proposed study is designed to contribute to the existing literature on alcohol use in college students. We are evaluating self-report measures of alcohol use, negative consequences, and readiness to change in mandated and never-mandated heavy college study drinkers before and after a brief alcohol intervention.

Subjects
    Inclusion Criteria

               In order to participate in the study, participants must be referred to college or community officials for violating the campus alcohol policy or volunteer for participation from a research study pool at the Department of Psychology or campus recruitment and a) report drinking at least monthly and consume at least 5-6 drinks on one drinking occasion in the past month; or b) endorse three alcohol-related problems on 3 to 5 occasions in the past 3 years; c) can provide a voluntary informed consent; d) age 18-24.

    Exclusion Criteria

               Students who do not meet above criteria will be excluded from participation. In addition, students who have had multiple disciplinary referrals related to alcohol or drug use, request more intensive treatment for drug or alcohol problems, report a history of severe and persistent alcohol or drug related symptoms including physiological dependence, and primarily use other substances will not included in the sample and will be referred to appropriate treatment as necessary.

    Number: The maximum number of subjects enrolled in this study will be 465.

Study Procedures

               The study requires that you attend two 50 minute appointments. Both appointments will take place at LSU's Psychological Services Center (PSC), 33 Johnston Hall. The first appointment will be the intake interview. During the intake interview you will meet with a clinician who will ask you questions about your family, social, educational, and drug/alcohol use history. You will also complete a series of self-report assessments about your alcohol and drug use. The second appointment will be a feedback interview during which you and a clinician will review and discuss the self-report measures collected in the previous appointment. The feedback interview will take approximately 50

minutes. Four weeks after completing the feedback interview, you will be asked to complete a brief series of self-report measures on your alcohol use.

If you agree to participate in this study, the following will occur:

1) You will be randomly (by chance) assigned to receive the intervention within 10 days (immediate intervention group) or after about 4 weeks (wait-list control group).
2) First appointment: You will be asked to come to the PSC for the assessment interview where you will meet with a clinician for approximately 50 minutes. The clinician will ask you questions including your personal and family history of drug and alcohol use. You will be asked to complete self-report measures that assess your perceptions of alcohol use among your peers and alcohol expectancies (beliefs about alcohol's effects).
3) If you were assigned to the immediate intervention group, you will be asked to come back to the PSC within 10 days to complete the feedback interview. If you were assigned to the wait-list control group, you will be asked to return to the PSC in approximately 4 weeks to complete the feedback interview and some additional self-assessment measures.
4) Second appointment: During the second appointment you will be asked to return to the PSC to meet with a clinician for approximately 50 minutes. During the session, you will receive feedback on the self-assessment measures you completed during the first appointment. You and the clinician may discuss topics such as your alcohol consumption, the risks and benefits associated with drinking, your perception of alcohol consumption among your peers, as well as strategies to help reduce risky drinking behavior.
5) Post-test: You will be asked to return to the clinic approximately 4 weeks after the second appointment to complete a brief series of post-test measures (10-15 min).
6) Follow-up: All experimental groups will be asked to return to the clinic at the following time periods: 3 months, 6 months, 12 months, and 24 months to complete a brief series of self-report measures (10-15 min).
7) Due to the length of the study and to ensure that we will be able to reach you, we will ask you to fill out a locator form with 5 different and reliable ways to contact you.

Benefits: You will be contributing to our knowledge regarding alcohol substance use that may help other alcohol and substance users in the future. In most cases, your study participation will fulfill your disciplinary requirements.

Risks/Discomforts: Possible loss of confidentiality. You might feel uncomfortable disclosing and discussing personal information.

Measures taken to reduce risk: Study participation is voluntary. All personal information obtained in this study will be kept confidential unless release is legally compelled (i.e., a court ordered

subpoena). To help keep information about you confidential, we have applied for a Confidentiality Certificate from the Department of Health and Human Services (DHHS). The Confidentiality Certificate will protect the investigators from being forced, in cases such as a court order or subpoena, to tell anyone that is not connected with this study about your participation in this study.

Information collected in this study will not be connected in any way to your academic, judicial, or disciplinary record. Referring sources and their staff (e.g., Office of Judicial Affairs, Office of Residence Life, etc) will not have access to identifiable data collected in this study. Data collected in this study will not be used to influence or determine the disciplinary or judicial actions regarding your case.

Once all data have been collected, participant names and phone numbers will be destroyed. During the study, participants will be assigned a random number, and this number will be the only link between their name, phone number, and data. All completed forms/data will be kept in a locked filing cabinet in the Archives Room at the PSC which is kept locked at all times and is accessible only to the PI (also director of the PSC, PSC staff/therapists). In addition, the data collectors will be trained in confidentiality.

Right to Refuse:	Participation in this study is voluntary, and you may withdraw from the study at any time without jeopardizing your academic standing at the LSU. If you have violated LSU's alcohol policy and have been referred to a college or community official for disciplinary action, withdrawing from the study will not adversely affect your referral status. We cannot guarantee that your disciplinary requirements will be fulfilled by your participation in the study.
Privacy:	Results of this study may be published, but no names or identifying information will be included in the publication. All personal information obtained in this study will be kept confidential unless release is legally compelled. Once all data have been collected, your name and telephone number will be destroyed. During the study, you will be assigned a random number, and this number will be the only link between your name, phone number, and your responses. Your forms will be kept in a locked filing cabinet in a locked office. Only research staff members will have access to data files or other research related information. The information collected in this research study will not be linked to your academic of judicial records at LSU.
Financial Information:	Participants will not be compensated for the assessment interview, feedback interview, or post-test. However, participants will receive compensation via a lottery-style cash and prize drawing for completing follow-up measures. Drawings will be held at 3-, 6-, 12-, and 24-months. In addition, participants who complete all four follow-up measures will be entered into a grand prize drawing.
Withdrawal:	Participants may withdraw from the study at any time without adversely affecting their relationship with LSU and the research staff.

Removal:	Aside from obvious disruption, harm, or threat of harm to other study participants or members of the research team, participants will not be dropped from the study.

Alternatives:	If you do not wish to participate in the present study, we will provide a list of referrals of alternative treatment programs on campus and in the community, but we cannot attest to their efficacy.

Unforeseeable Risks:	As with any study, confidentiality is a concern, however, confidentiality risk is unlikely given the steps we have taken to ensure that participant identifying information is kept confidential.

Certificate of Confidentiality:	The researchers in this study have applied for a Certificate of Confidentiality from the Department of Health and Human Services (DHHS). This certificate will cover all of the data collected in this study. The certificate protects the identities of research participants from any person not connected with the research itself. This protection includes "any civil, criminal, administrative, legislative, or other proceedings whether Federal, State, or local" (quoted from the certificate). The only exception to the confidentiality of the information you provide concerns the sexual of physical abuse of a child or elder, or threatened harm to yourself or others. If the information on current child/elder abuse is given to the researchers, or if there are threats to harm yourself or others, the researchers are required to report this to the authorities. The obligation to report includes alleged or probable abuse as well as known abuse. Except for these requirements, the Certificate of Confidentiality means that the information provided by you cannot be used in any criminal or legal proceedings."

Study-associated injury or illness:	If you are experiencing medical problems that appear to be more serious than typical, acute alcohol withdrawal, you will be instructed to seek the advice of your physician.

Study-related illness or injury:	Participants are instructed to seek necessary medical care from their physician and contact the Principal Investigator, Dr. Amy Copeland (578-4117) in the event of a study-related illness or injury.

New Findings:	Any significant new findings developed from the study data or independent sources during the course of research which may influence your willingness to continue in the study will be explained to you.

Signatures:

"The study has been discussed with me and all my questions have been answered. I may direct additional questions regarding study specifics to the investigators. If I have questions about subjects' rights or other concerns, I can contact Robert C. Mathews, Chairman, LSU Institutional Review Board, (225)578-8692. I agree to participate in the study described above and acknowledge the researchers' obligation to provide me with a copy of this consent form if signed by me."

_____   _____

Participant Signature   Date

_____   _____

Witness Signature   Date

Appendix B

Personalized Feedback

Your Drinking Profile
According to the information you gave us, the number of occasions you drank

(frequency) was: 3-4 times a month
On the weekends, you drank an average of 7-8 drinks per occasion.

Level of Intoxication
Blood Alcohol Concentration (BAC) is an indicator of the extent to which alcohol is affecting your body and behavior.

BAC is like a thermometer- the higher it is, the greater the intoxication. How high your BAC gets depends on your weight, the strength and number of drinks you have, and how quickly you drink.

Factors that may <u>increase</u> BAC:
Drinking on an empty stomach
Using alcohol with other drug
Emotional states / menstrual cycle phase
Fatigue, dehydration, illness

Factors that do <u>not affect</u> BAC:
Coffee and other stimulants
Exercise
A cold shower
Fruit juices, special concoctions, or supplements
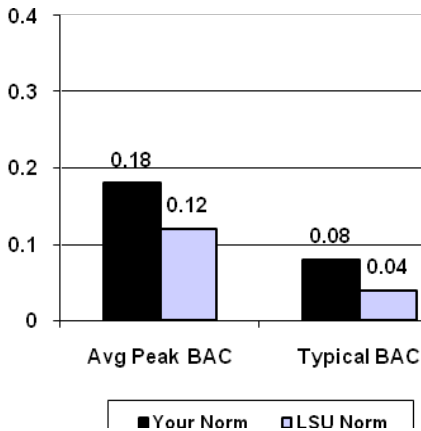
.40 -- Coma, Respiratory Arrest

.30 -- Loss of consciousness &
          risk of death

.15 – Risk of blackout
.10 – Clear motor impairment
.08 – Legally intoxicated
.05 – Diminishing returns
Average peak values are based on what we know about students attending LSU.

Estimated highest BAC during a typical week: 0.08 %

Estimated highest BAC during your heaviest drinking episode: 0.18 %

Drinking Norms

This is what you told us you believed to be the average frequency and quantity of alcohol consumed by students your age, as well as the actual drinking norms for LSU students. You said that a typical university student drinks once or twice a week and consumes five to six drinks per drinking occasion.

Most students think other students drink more than they actually do. Most college students drink 2 or fewer drinks when they drink.

Based on the information we collected, it looks like you drink about 20 drinks per week, which makes your percentile ranking about 91. This means that you drink as much or more than 91 percent of college students nationwide.

Recent survey data at LSU indicates that on a heavy drinking (binge) occasion you drink as much or more than 90 % of LSU students. On a heavy drinking night, the average LSU student drinks about 4 drinks.

Beliefs About the Effects of Alcohol

You listed the following alcohol effects as "good" and "likely to occur" when you consume alcohol:
- I would be outgoing
- I would be humorous
- It would be easier to express my feelings
- I would be friendly
- I would feel unafraid
- My body would be relaxed
- I would feel calm
- It would be easier to talk to people

Does Alcohol really do these things? Research suggests many of the social effects of alcohol and based on myths, placebo effects, and expectations we bring to the drinking situations.

Alcohol-Related Problems

You indicated the following alcohol-related consequences had occurred in the prior year

- Felt that you needed more alcohol than you used to use in order to get the same effect
- Missed a day (or part of a day) of school or work

You can minimize the effects of alcohol by choosing to drink less or not at all.

Alcohol-Financial Costs

Based upon your typical quantity and frequency of alcohol use, you are typically spending the following, depending on your choice of alcohol:

Domestic Beer (cans): $600.00 per semester

Mixed Drinks: $1,200.00 per semester

Weight

You indicated that in a typical weekend night you are getting the following amount of calories from alcohol:

840 calories

it would require 168 minutes of brisk walking, or 91 minutes on the Stairmaster, or by running roughly 7.7 miles to expend this number of calories consumed during each typical drinking occasion.

Alcohol and Sexual Behavior

You indicated that you have had the following alcohol-related sexual experiences:

- I would enjoy sex more
- When I drink enough alcohol to feel the effects, I have sex with people that I wouldn't have sex with when I was sober.
- When I drink enough alcohol to feel the effects, I am more likely to do something sexually that is risky.

Alcohol doesn't improve sexual enjoyment or performance. You can reduce your risks of unwanted sexual experiences by being selective about if and how much to drink, especially on first dates or at larger parties. Use the buddy system to watch out for friends. Keep an eye on your drinks.

Alcohol Dependence

You acknowledged the following experiences, which are associated with a pattern of dependency:

- Felt that you needed more alcohol than you used to use in order to get the same effect

Based upon the data provided, we estimate your level of alcohol tolerance to be:

LOW

Tolerance means needing more alcohol to get the same effect as you used to get at lower levels. Tolerance reduces pleasurable effects of alcohol and makes drinking more expensive. It can also be a sign that you are becoming dependent on alcohol.

Family History

We consider your risk based on family history to be:

POSITIVE

Most people have heard that having a family history of alcohol problems increases your risk of alcohol problems yourself. While this is true, it's also true that being aware of your drinking and making lower-risk decisions about drinking now can lessen your risk of developing an alcohol problem in the future.

Perceived Risk

Your concern about your drinking habits appears to be:

LOW

Protective Factors

These are some things you <u>are</u> doing to avoid negative consequences from drinking:

- Avoid trying to "keep up" or out-drink others
- Use a designated driver
- Know where you drink has been at all times

These are some other strategies you might use to reduce negative effects of drinking:

Switch between alcohol and non-alcoholic look-alike beverages.
Determine, in advance, not to exceed a set number of drinks.
Choose not to drink alcohol. Eat before and/or during drinking.
Have a friend let you know when you've had enough.
Pace yourself at 1 or fewer per hour. Avoid drinking games.

Appendix C

Blood Alcohol Content (BAC) Card

BAC for 150-pound male

Number of Drinks	0 hr	1 hr	2 hr	3 hr	4 hr	5 hr	6 hr
1	.025	.009	0	0	0	0	0
2	.050	.034	.018	.002	0	0	0
3	.075	.059	.043	.027	.011	0	0
4	.100	.084	.068	.052	.036	.020	.004
5	.125	.109	.093	.077	.061	.045	.029
6	.150	.134	.118	.102	.086	.070	.054
7	.175	.159	.143	.127	.111	.095	.079
8	.200	.184	.168	.152	.136	.120	.104
9	.225	.209	.193	.177	.161	.145	.129
10	.250	.234	.218	.202	.186	.170	.154

Appendix D

Rutgers Alcohol Problem Inventory

INSTRUCTIONS: Different things happen to people while they are drinking ALCOHOL or as a result of their ALCOHOL use. Some of these things are listed below. Please indicate how many times each has happened to you during the last three years while you were drinking alcohol or as the result of your alcohol use.

How many times did the following things happen to you while you were drinking alcohol or because of your alcohol use during the last three years?

1. Not able to do your homework or study for a test.

0	1	2	3	4
Never	1-2 times	3-5 times	6-10 times	More than 10 times

2. Got into fights, acted badly, or did mean things.

0	1	2	3	4
Never	1-2 times	3-5 times	6-10 times	More than 10 times

3. Missed out on other things because you spent too much money on alcohol.

0	1	2	3	4
Never	1-2 times	3-5 times	6-10 times	More than 10 times

4. Went to work or school high or drunk

0	1	2	3	4
Never	1-2 times	3-5 times	6-10 times	More than 10 times

5. Caused shame or embarrassment to someone.

0	1	2	3	4
Never	1-2 times	3-5 times	6-10 times	More than 10 times

6. Neglected your responsibilities.

0	1	2	3	4
Never	1-2 times	3-5 times	6-10 times	More than 10 times

7. Relatives avoided you.

0	1	2	3	4
Never	1-2 times	3-5 times	6-10 times	More than 10 times

8. Felt that you needed more alcohol than you used to use in order to get the same effect.

0	1	2	3	4
Never	1-2 times	3-5 times	6-10 times	More than 10 times

9. Tried to control your drinking by trying to drink only at certain times of the day at certain places.

0	1	2	3	4
Never	1-2 times	3-5 times	6-10 times	More than 10 times

10. Had withdrawal symptoms, that is, felt sick because you stopped or cut down on drinking.

0	1	2	3	4
Never	1-2 times	3-5 times	6-10 times	More than 10 times

11. Noticed a change in your personality

0	1	2	3	4
Never	1-2 times	3-5 times	6-10 times	More than 10 times

12. Felt that you had a problem with alcohol

0	1	2	3	4
Never	1-2 times	3-5 times	6-10 times	More than 10 times

13. Missed a day (or part of a day) of school or work.

0	1	2	3	4
Never	1-2 times	3-5 times	6-10 times	More than 10 times

14. Tried to cut down or quit drinking

0	1	2	3	4
Never	1-2 times	3-5 times	6-10 times	More than 10 times

15. Suddenly found yourself in a place that you could not remember getting to.

0	1	2	3	4
Never	1-2 times	3-5 times	6-10 times	More than 10 times

16. Passed out or fainted suddenly

0	1	2	3	4
Never	1-2 times	3-5 times	6-10 times	More than 10 times

17. Had a fight, argument or bad feelings with a friend.

0	1	2	3	4
Never	1-2 times	3-5 times	6-10 times	More than 10 times

18. Had a fight, argument or a bad feeling with a family member.

0	1	2	3	4
Never	1-2 times	3-5 times	6-10 times	More than 10 times

19. Kept drinking when you promised yourself not to

0	1	2	3	4
Never	1-2 times	3-5 times	6-10 times	More than 10 times

20. Felt you were going crazy.

0	1	2	3	4
Never	1-2 times	3-5 times	6-10 times	More than 10 times

21. Had a bad time

0	1	2	3	4
Never	1-2 times	3-5 times	6-10 times	More than 10 times

22. Felt physically or psychologically dependent on alcohol.

0	1	2	3	4
Never	1-2 times	3-5 times	6-10 times	More than 10 times

23. Was told by a friend or a neighbor to stop or cut down on drinking

0	1	2	3	4
Never	1-2 times	3-5 times	6-10 times	More than 10 times

Appendix E

Daily Drinking Questionnaire

INSTRUCTIONS

For each day of the week, fill in both the number of drinks consumed and the number of hours you typically drink.

Please be sure to fill out the information regarding your gender, weight, and height.

QUESTION 1

For the *past month*, please fill in a number for each day of the week including the *typical number of drinks* you usually consume on that day, and the *typical number of hours* you usually drink on that day.

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

Weight   Gender   Height

QUESTION 2: RESIDENCE AND EMPLOYMENT

In the last quarter (or equivalent time period), please circle the most appropriate answers. Please choose one answer for each column. In responding to the question "Paid employment?", please circle the answer closest to the average number of hours you worked during that quarter.

Were you enrolled in college?   This college/university   Other college/university   No

Were you a Greek member?   Yes   No

Where did you live   Greek House   Dorm   With Parents   Apartment   Other

Paid employment?   No   ¼ time   ½ time   ¾ time   Full-time

Appendix F

Quantity Frequency Index

INSTRUCTIONS: Carefully read and answer the following questions about your alcohol use. Please try to answer as accurately and honestly as possible. Your answers will be kept CONFIDENTIAL. They will NOT be revealed to the referring office or made available to other departments to influence your disciplinary status.

1. Think of the occasion you drank the most this past month. How much did you drink?
    1. 0 drinks
    2. 1-2 drinks
    3. 3-4 drinks
    4. 5-6 drinks
    5. 7-8 drinks
    6. 9-10 drinks
    7. 11-12 drinks
    8. 13-14 drinks
    9. 15-16 drinks
    10. 17-18 drinks
    11. 19 or more drinks

2. On a given weekend evening, you much alcohol do you typically drink? Estimate for the past month.
    1. 0 drinks
    2. 1-2 drinks
    3. 3-4 drinks
    4. 5-6 drinks
    5. 7-8 drinks
    6. 9-10 drinks
    7. 11-12 drinks
    8. 13-14 drinks
    9. 15-16 drinks
    10. 17-18 drinks
    11. 19 or more drinks

3. How often in the past month did you drink alcohol?
    1. Never
    2. Monthly
    3. 2-3 times per month
    4. 2-3 times per week
    5. Daily

Appendix G

Readiness to Change Questionnaire

Please read the sentence below carefully. For each one please circle the answer that best describes how you feel. Your answers will be private and confidential.

	Strongly Disagree	Disagree	Unsure	Agree	Strongly Agree
1. My drinking is okay as it is.	1	2	3	4	5
2. I am trying to drink less than I used to.	1	2	3	4	5
3. I enjoy my drinking but sometimes I drink too much.	1	2	3	4	5
4. I should cut down on my drinking,	1	2	3	4	5
5. It's a waste of my time thinking about drinking.	1	2	3	4	5
6. I have just recently changed my drinking habits.	1	2	3	4	5
7. Anyone can talk about wanting to do something about drinking, but I am actually doing something about it.	1	2	3	4	5
8. I am at the stage where I should think about drinking less alcohol.	1	2	3	4	5
9. My drinking is a problem.	1	2	3	4	5
10. It's alright for me to keep drinking as I do now.	1	2	3	4	5
11. I am actually changing my drinking habits right now.	1	2	3	4	5
12. My life would still be the same even if I drunk less.	1	2	3	4	5

Appendix H

Stages of Change

Alcohol stage item for non-dependent drinkers.

Males, in the past month have you had more than 5 drinks in a row (females use 4 or more drinks in a row). Check one.

1. Yes and I do not intend to stop drinking 5 or more drinks in a row. ☐

2. Yes, but I intend to stop drinking 5 or more drinks in a row during the next 6 months. ☐

3. Yes, but I intend to stop drinking 5 or more drinks in a row during the next 30 days. ☐

4. No, but I have had 5 or more drinks in a row in the past 6 months. ☐

5. No, and I have not had 5 or more drinks in a row in the past 6 months. ☐

6. No, I have never had 5 or more drinks in a row. ☐

Appendix I

Alcohol Use Disorder Identification Test

INSTRUCTIONS:
Please circle the answer that is correct for you.

1. How often do you have a drink containing alcohol?

0	1	2	3	4
Never	Less than monthly	Monthly	Weekly	Daily or almost daily

2. How many drinks containing alcohol do you have on a typical day when you are drinking?

0	1	2	3	4
1 or 2	3 or 4	5 or 6	7 to 9	10 or more

3. How often do you have six drinks or more on one occasion?

0	1	2	3	4
Never	Less than monthly	Monthly	Weekly	Daily or almost daily

4. How often during the last year have you found that you were not able to stop drinking once you have started?

0	1	2	3	4
Never	Less than monthly	Monthly	Weekly	Daily or almost daily

5. How often during the last year have you failed to do what was normally expected from you because of drinking?

0	1	2	3	4
Never	Less than monthly	Monthly	Weekly	Daily or almost daily

6. How often during the last year have you needed a first drink in the morning to get yourself going after a heavy drinking session?

0	1	2	3	4
Never	Less than monthly	Monthly	Weekly	Daily or almost daily

7. How often during the last year have you had a feeling of guilt or remorse after drinking?

0	1	2	3	4
Never	Less than monthly	Monthly	Weekly	Daily or almost daily

8. How often during the last year have you been unable to remember what happened the night before because you had been drinking?

0	1	2	3	4
Never	Less than monthly	Monthly	Weekly	Daily or almost daily

9. Have you or someone else been injured as a result of drinking?

0	1	2
No	Yes, but not in the last year	Yes, during the last year

10. Has a relative or friend or a doctor or other health worker been concerned about your drinking or suggested you cut down?

0	1	2
No	Yes, but not in the last year	Yes, during the last year

Alcohol Dependence Scale

Carefully read each question and the possible answers provided. Answer each question by checking the one choice that is most true for you. The word "drinking" in a question refers to "drinking alcoholic beverages." These questions refer to the past 12 months. Please answer all questions.

1. How much did you drink the last time you drank?
    0 _____ Enough to get high or less
    1 _____ Enough to get drunk
    2 _____ Enough to pass out

2. Do you often have hangovers on Sunday or Monday mornings?
    0 _____ No
    1 _____ Yes

3. Have you have the "shakes" when sobering up? (hands tremble, shakes inside)
    0 _____ No
    1 _____ Sometimes
    2 _____ Almost every time I drink

4. Do you get physically sick (e.g., vomit, stomach cramps) as a result of drinking?
    0 _____ No
    1 _____ Sometimes
    2 _____ Almost every time I drink

5. Have you had the "DT's" (delirium tremens), that is, seen, felt, or heard things that aren't really there; felt very anxious, restless or overexcited?
    0 _____ No
    1 _____ Sometimes
    2 _____ Several times

6. When you drink, do you stumble about, stagger and weave?
    0 _____ No
    1 _____ Yes
    2 _____ Several times

7. As a result of drinking, have you felt overly hot and sweaty (feverish)?
    0 _____ No
    1 _____ Once
    2 _____ Several Times

8. As a result of drinking, have you seen things that were not really there?
    0 _____ No
    1 _____ Yes
    2 _____ Several Times
9. Do you panic because you fear you may not have a drink when you need it?
    0 _____ No
    1 _____ Yes

10. Have you had blackouts ("loss of memory" without passing out) as a result of drinking?
    0 _____ No, Never
    1 _____ Sometimes
    2 _____ Often
    3 _____ Almost every time

11. Do you carry a bottle with you or keep one close at hand?
    0 _____ No
    1 _____ Some of the time
    2 _____ Most of the time

12. After a period of abstinence (not drinking), do you end up drinking heavily again?
    0 _____ No
    1 _____ Once
    2 _____ Almost every time

13. In the past 12 months, have you passed out as a result of drinking?
    0 _____ No
    1 _____ Once
    2 _____ More than once

14. Have you had a convulsion (fit) following a period of drinking?
    0 _____ No
    1 _____ Once
    2 _____ Several times

15. Do you drink throughout the day?
    0 _____ No
    1 _____ Yes

16. After drinking heavily, has your thinking been fuzzy or unclear?
    0 _____ No
    1 _____ Yes, but only a few hours
    2 _____ Yes, for one or two days
    3 _____ Yes, for many days

17. As a result of drinking, have you felt your heart beating rapidly?
    0 _____ No
    1 _____ Once
    2 _____ Several times

18. Do you almost constantly think about drinking alcohol?
    0 _____ No
    1 _____ Yes

19. As a result of drinking, have you heard "things" that were not really there?
    0 _____ No
    1 _____ Once
    2 _____ Several times

20. Have you had weird and frightening sensations when drinking?
    0 _____ No
    1 _____ Once or twice
    2 _____ Often

21. As a result of drinking, have you "felt things" crawling on you that were not really there   (e.g., bugs, spiders)?
    0 _____ No
    1 _____ Once
    2 _____ Several times

22. With respect to blackouts (loss of memory):
    0 _____ Have never had a blackout
    1 _____ Have had blackouts less than an hour
    2 _____ Have had blackouts that last several hours
    3 _____ Have blackouts that last for a day or more

23. Have you ever tried to cut down on your drinking and failed?
    0 _____ No
    1 _____ Once
    2 _____ Several times

24. Do you gulp drinks (drink quickly)?
    0 _____ No
    1 _____ Yes

25. After taking one or two drinks, can you usually stop?
    0 _____ Yes
    1 _____ No

Drinking Norms Rating Form

INSTRUCTIONS
Please choose one answer for questions 1 and 2

1. Dormitory/residence hall
2. Fraternity
3. Sorority
4. With Parents
5. Own Residence

1. What type of residence do you currently live in?
2. What type of residence do you expect to live in next semester?

Instructions	A. How often they drink	B. How much they drink on a typical weekend evening
We are interested in your estimates of A) *How often* and B) *How much* different types if people drink. For the following questions, please assume whenever possible that you are *rating a typical person of your same sex*. In each of the following situations, please enter the corresponding number, giving one answer for (A) (1-7), and one answer for (B) (1-6).	1. Less than once a month 2. About once a month 3. Two or three times a month 4. Once or twice a week 5. Three or four times a week. 6. Nearly every day 7. Once a day	1. 0 drinks 2. 1-2 drinks 3. 3-4 drinks 4. 5-6 drinks 5. 7-8 drinks 6. More than 8 drinks
3. An average college- bound senior in high school		
4. An average university student		
5. An average college student residing in a fraternity		
6. An average college student residing in a sorority		
7. An average college student residing in dormitory/residence hall		
8. An average college student residing with his/her parents		
9. An average college student residing in his/her own residence		
10. Your closest friends		

Appendix L

Protective Behavioral Strategies Survey

INSTRUCTIONS:

Please indicate the degree to which you engage in the following behaviors when using alcohol or "partying."

Never	Very rarely	Sometimes	Most of the time	Always
1	2	3	4	5

1. Determine not to exceed a set number of drinks._____

2. Alternate alcoholic and nonalcoholic drinks._____

3. Have a friend let you know when you have had enough._____

4. Leave the bar/party at a predetermined part._____

5. Stop drinking at a predetermined time._____

6. Drink water while drinking alcohol._____

7. Put extra ice in your drink._____

8. Avoid drinking games._____

9. Drink shots of liquor._____

10. Avoid mixing different types of alcohol.   _____

11. Drink slowly rather than gulp or chug._____

12. Avoid trying to "keep up" or out-drink others._____

13. Use a designated driver._____

14. Make sure you go home with a friend._____

15. Know where your drink has been at all times._____

Comprehensive Effects of Alcohol

1) What would you expect to happen if you were under the influence of alcohol, and
2) whether you think the effect is good or bad

INSTRUCTIONS

A. Choose from "disagree to agree" depending on whether you expect the effect to happen to you *if you were under the influence of alcohol*. These effects will vary, depending on the amount of alcohol you typically consume. *Circle one answer for the first set of numbers after each statement.*

B. Choose from BAD TO GOOD depending on whether you think the particular effect is bad, neutral, good, etc. We want to know whether you think a particular effect is bad or good, regardless of whether or not you expect it to happen to you. Circle only one answer for the last set of numbers after each statement.

Example: 1. I would be….   1 2 3 4   This effect is   1 2 3 4 5

IF I WERE UNDER THE INFLUENCE FROM DRINKING ALCOHOL:	1 = Disagree 2 = Slightly disagree 3 = Slightly agree 4 = Agree	1 = Bad 2 = Slightly Bad 3 = Neutral 4 = Slightly Good 5 = Good

1. I would be outgoing   1 2 3 4 This effect is 1 2 3 4 5

2. My senses would be dulled   1 2 3 4 This effect is 1 2 3 4 5

3. I would be humorous   1 2 3 4 This effect is 1 2 3 4 5

4. My problems would seem worse   1 2 3 4 This effect is 1 2 3 4 5

5. It would be easier to express my feelings   1 2 3 4 This effect is 1 2 3 4 5

6. My writing would be impaired   1 2 3 4 This effect is 1 2 3 4 5

7. I would feel sexy   1 2 3 4 This effect is 1 2 3 4 5

8. I would have difficulty thinking   1 2 3 4 This effect is 1 2 3 4 5

9. I would neglect my obligations   1 2 3 4 This effect is 1 2 3 4 5

10. I would be dominant   1 2 3 4 This effect is 1 2 3 4 5

11. My head would feel fuzzy   1 2 3 4 This effect is 1 2 3 4 5

12. I would enjoy sex more   1 2 3 4 This effect is 1 2 3 4 5

13. I would feel dizzy   1 2 3 4 This effect is 1 2 3 4 5

14. I would be friendly   1 2 3 4 This effect is 1 2 3 4 5

15. I would be clumsy   1 2 3 4 This effect is 1 2 3 4 5

16. It would be easier to act my fantasies   1 2 3 4 This effect is 1 2 3 4 5

17. I would be loud, boisterous, or noisy   1 2 3 4 This effect is 1 2 3 4 5

18. I would feel peaceful	1	2	3	4 This effect is	1	2	3	4 5		
19. I would be brave and daring	1	2	3	4 This effect is	1	2	3	4 5		
20. I would feel unafraid	1	2	3	4 This effect is	1	2	3	4 5		
21. I would feel creative	1	2	3	4 This effect is	1	2	3	4 5		
22. I would be courageous	1	2	3	4 This effect is	1	2	3	4 5		
23. I would feel shaky or jittery the next day	1	2	3	4 This effect is	1	2	3	4 5		
24. I would feel energetic	1	2	3	4 This effect is	1	2	3	4 5		
25. I would act aggressively	1	2	3	4 This effect is	1	2	3	4 5		
26. My responses would be slow	1	2	3	4 This effect is	1	2	3	4 5		
27. My body would be relaxed	1	2	3	4 This effect is	1	2	3	4 5		
28. I would feel guilty	1	2	3	4 This effect is	1	2	3	4 5		
29. I would feel calm	1	2	3	4 This effect is	1	2	3	4 5		
30. I would feel moody	1	2	3	4 This effect is	1	2	3	4 5		
31. It would be easier to talk to people	1	2	3	4 This effect is	1	2	3	4 5		
32. I would be a better lover	1	2	3	4 This effect is	1	2	3	4 5		
33. I would feel self-critical	1	2	3	4 This effect is	1	2	3	4 5		
34. I would be talkative	1	2	3	4 This effect is	1	2	3	4 5		
35. I would act tough	1	2	3	4 This effect is	1	2	3	4 5		
36. I would take risks	1	2	3	4 This effect is	1	2	3	4 5		
37. I would feel powerful	1	2	3	4 This effect is	1	2	3	4 5		
38. I would act sociable	1	2	3	4 This effect is	1	2	3	4 5		

Appendix N

Alcohol Monitoring Card

Date	Start time	End time	Number of drinks			Total # of drinks	Situation
			Beer	Wine	Liquor		

Vita

Meredith Ashley Terlecki was born and raised near Denver, Colorado. In 2003, she earned her Bachelor of Science degree in behavioral neuroscience and a Bachelor of Arts degree in French from Lafayette College in Easton, Pennsylvania. Since 2005, she has worked under the supervision of Amy L. Copeland, Ph.D., in the Smoking and Substance Use Laboratory at Louisiana State University. Her primary research interests include the prevention and treatment of licit substance use disorders among high-risk populations.