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FEEDBACK-BASED ALCOHOL INTERVENTIONS FOR MANDATED STUDENTS:
A COMPARISON OF INDIVIDUAL, GROUP, AND ELECTRONIC FORMATS

by

JACQUELINE ALFONSO
B.A. Florida International University, 2000
M.S. University of Central Florida, 2005

A dissertation submitted in partial fulfillment of the requirements
for the degree of Doctor of Philosophy
in the Department of Psychology
in the College of Sciences
at the University of Central Florida
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Major Professor: Michael E. Dunn

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ABSTRACT

The present study examined the effectiveness of personalized alcohol feedback interventions in three different delivery formats on alcohol use and related negative consequences in a sample of mandated college students referred for alcohol-related violations. Participants were randomized to one of three conditions: an individually-delivered face-to-face intervention, a group-delivered face-to-face intervention, or a web-based electronically-delivered intervention. Given that the current study sought to modify factors associated with alcohol use, analyses were conducted using only those participants who reported alcohol use at the baseline assessment. The final sample resulted in 173 participants, 18-years-of-age and over, and consisted of 57% males ($n = 98$) who ranged in age from 18 to 25 years, with a mean age of 18.77 ($SD = 1.08$). The sample distributions in the individual, group, and electronic conditions were 53 (35 males), 72 (41 males), and 48 (22 males), respectively. Self-reported participant race was 82% White, 9% "Other", 4% Black, 4% Asian, and 1% American Indian or Alaska Native, with 91% classifying their ethnicity as Non-Latino/a. Participant class standing consisted of 69% freshmen, 21% sophomores, 6% juniors, and 4% seniors. The type of housing participants reported living in was comprised of 51% on-campus residence hall, 24% off-campus without parents, 20% university-affiliated off-campus, 2% off-campus with parents, 2% "other" type of housing, and 1% who reported living in a fraternity/sorority house.

Findings revealed statistically significant reductions in alcohol use for the individually-delivered intervention, and statistically significant reductions in alcohol-related harms for the individually- and electronically-delivered interventions. No statistically significant results were found for the group-delivered intervention. This study is the first randomized clinical trial to compare an empirically supported individually-delivered personalized alcohol feedback intervention with more cost-effective group- and electronically-delivered feedback formats

within a single research design. This examination also sought to add to the extant literature on mandated college students by expanding the range of participant drinking habits reported at baseline to include all drinking levels (excluding those meeting criteria for alcohol dependence), not solely those classified as ‘heavy drinking,’ as is the typical research convention.

Additionally, given the potential demand characteristics to underreport illegal and/or illicit behaviors, this is the first study to provide mandated college students with anonymity pre- and post-intervention. Suggestions for future research, limitations of the current investigation, and implications for the development and improvement of personalized feedback interventions and of interventions aimed at mandated college students are also discussed.

This work is dedicated to my grandparents, Rosa and Telesforo Molina (Mima and Pipo). Their courage, hard work, and determination to provide a life of freedom for their family and generations to come have made it possible for me to live out my dreams. For that, I will be forever grateful. This is just a small token of my appreciation for their unconditional love.

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INTRODUCTION

The Substance Abuse and Mental Health Services Administration (SAMHSA) reports that young adults aged 18 to 25 show the highest prevalence of problem drinking. Among this age group, rates of current, binge (defined as five or more drinks on the same occasion), and heavy (defined as binge drinking five or more times in one month) alcohol use rank highest, as does the likelihood of having met criteria for alcohol abuse and dependence (SAMHSA, 2006). College student alcohol use in particular is linked to a variety of serious consequences, with over 500,000 students injured in alcohol-related incidents, more than 600,000 assaulted by a student peer who had been drinking, and more than 1,600 student deaths each year from injuries related to alcohol use (Hingson, Heeren, Winter, & Wechsler, 2002). In fact, the National Survey on Drug Use and Health reports that college students are more likely than their non-student cohorts to engage in high-risk drinking behavior and to drive while under the influence of alcohol (SAMHSA, 2006). Given this information, college students are not only placing themselves at a greater risk for harmful alcohol consequences, but are elevating the risk for their peers and surrounding community as well.

The high-risk nature of college student drinking has created the need to develop effective alcohol prevention and intervention programs tailored specifically for use with college student populations. A landmark report issued by the National Institute on Alcohol Abuse and Alcoholism (NIAAA, 2002) summarized the state of the research targeting college student alcohol use and classified approaches in four tiers, ranging from strong research evidence of effectiveness with college students (Tier I), to evidence of ineffectiveness (Tier 4). The report was generated by a panel composed of accomplished scientists and college presidents. After an exhaustive review of available data, the expert panel identified only three Tier I strategies: combining cognitive-

behavioral skills with norms clarification and motivational enhancement interventions, offering brief motivational enhancement interventions, and challenging alcohol expectancies.

Cognitive-behavioral skills training aims to alter an individual's irrational beliefs regarding alcohol consumption by using strategies such as daily drink monitoring and changing expectancies about the effects of alcohol. Norms or values clarification assesses individual perceptions about the drinking behavior of other students and uses data to correct misperceptions regarding the amount of alcohol students drink and the number of students who engage in heavy drinking behavior (NIAAA, 2002). Motivational enhancement is based on the theory that individuals are solely responsible for changing their drinking behavior. As such, motivational enhancement seeks to increase the intrinsic desire for behavior change using a non-judgmental, empathic, and directive approach (Miller & Rollnick, 2002). Expectancy challenge interventions combine alcohol information and experiential learning to modify beliefs about the effects of alcohol and demonstrate that increased sociability and sexual attractiveness, for example, are not a direct result of alcohol consumption (see Darkes and Goldman, 1993, 1998).

The Alcohol Skills Training Program (ASTP; Kivlahan, Coppel, Fromme, Miller, & Marlatt, 1990), developed from relapse prevention (RP; Marlatt & Gordon, 1985) strategies, is one of the earliest examples of an alcohol intervention that incorporates cognitive-behavioral skills-based training and motivational enhancement techniques. The ASTP is often cited as the forerunner to a variety of subsequent programs that used aspects of this approach. The original ASTP, delivered in 90-minute sessions over eight consecutive weeks, taught groups of participants the skills necessary to self-manage alcohol consumption within a motivational enhancement framework. The intervention was subsequently shortened for effective application in six sessions, with research documenting the success of the ASTP in reducing the overall risk

associated with heavy drinking in young adults (Baer, et al., 1992; Fromme, Marlatt, Baer, & Kivlahan, 1994; Kivlahan, et al., 1990).

Despite empirical support for the six- to eight-session versions of the ASTP, time and resource constraints generated the need to develop effective brief interventions that address high-risk alcohol use. With reviews of the literature supporting the implementation of brief alcohol interventions (Bien, Miller, & Tonigan, 1993), and specifically for use with college students (Larimer, Cronce, Lee, & Kilmer, 2004; NIAAA, 2002), the empirically supported content of the group-administered ASTP was developed into the brief intervention known as the Brief Alcohol Screening and Intervention for College Students (BASICS; Dimeff, Baer, Kivlahan, & Marlatt, 1999).

The BASICS intervention, designed for individual delivery in two 50-minute sessions, incorporates motivational interviewing and personalized feedback. Content includes topics such as social norms, expectancies, blood alcohol content (BAC), and risk and protective factors, while incorporating skills training to promote lower-risk alcohol consumption (Dimeff et al., 1999). Several studies evaluating BASICS in high-risk college student samples have demonstrated reductions in both alcohol consumption and related negative consequences (Baer, Kivlahan, Blume, McKnight, & Marlatt, 2001; Dimeff et al., 1999; Murphy et al., 2001), with results lasting as long as four years post-intervention (Baer et al., 2001).

Although the BASICS enjoys substantial empirical support (e.g., Baer et al., 2001; Murphy et al., 2001; White et al., 2006), the high cost of providing an individually-delivered alcohol intervention to students spurred the search for a more cost-effective application of brief motivational interventions. To this end, Murphy and colleagues (2004) examined the effectiveness of providing a specific BASICS component, personalized feedback, on the reduction of alcohol use. The study compared the provision of personalized feedback within the

context of a BASICS motivational interview to feedback delivered as a stand-alone intervention. Comparison of feedback provided with and without a one-on-one motivational interview revealed comparable reductions in alcohol consumption, supporting the continued search for more cost-effective interventions that incorporate feedback as an intervention component.

Interventions that utilize feedback have received promising support in the research literature, with several studies having implemented personalized feedback as a stand-alone alcohol intervention effectively (Agostinelli, Brown, & Miller, 1995; Collins, Carey, & Sliwinski, 2002; Walters, 2000). A review by Walters & Neighbors (2005) of feedback interventions in college student samples found feedback to be effective in reducing alcohol consumption whether delivered face-to-face, by mail, or via the Internet. In fact, Kypri and colleagues (2003) report that college students prefer to use electronic methods of receiving alcohol screening and feedback to individually delivered interventions similar in content. Additionally, employing electronic methods has been found to increase the likelihood of intervention utilization, as well as the reporting of undesirable behaviors (McCabe, Boyd, Couper, Crawford, & D'Arcy, 2002; Turner et al., 1998), with research finding no significant differences between data collected electronically versus more traditional paper-and pencil methods (Kypri, Gallagher, & Cashell-Smith, 2004; McCabe et al., 2002; Miller et al., 2002).

A recent intervention called the “electronic Check-Up to Go” (e-CHUG; Walters, Van Sickle, & Moyer, 2004) incorporates several of the aforementioned elements found to be effective in reducing college student alcohol use. This brief, web-based, commercially available assessment and feedback tool uses motivational interviewing strategies to provide detailed normative and risk factor alcohol information personalized to each individual. A self-administered intervention that requires only 15- to 20-minutes to complete, the e-CHUG eliminates the need for face-to-face contact with a provider while disseminating the content

found in the most successful brief personalized feedback interventions. A randomized trial conducted with college freshmen utilized the e-CHUG and demonstrated significant reductions in weekly alcohol consumption at 3-month follow-up (Steiner, Woodall, & Yeagley, 2005).

Although the ASTP, BASICS, and stand-alone feedback interventions such as the e-CHUG have garnered empirical support for use with heavy-drinking college students, relatively few studies have included individuals who have violated campus alcohol policies, a specific subpopulation known as ‘mandated,’ ‘sanctioned,’ or ‘judicially-referred’ students, in their investigations. Research comparing sanctioned versus non-sanctioned students has highlighted the need for heightened concern. A study by Caldwell (2002) comparing the alcohol consumption habits of mandated versus non-mandated students found that individuals who are sanctioned for alcohol violations tend to be heavier drinkers and more frequent alcohol abusers than their non-mandated counterparts. In addition, recent investigations have found that mandated students also experience a greater number of alcohol-related problems than non-mandated students (Barnett et al., 2004), supporting prior research that college students who violate alcohol policies not only engage in riskier alcohol use, but exhibit increased problems related to their use as well (Flynn & Brown, 1991; O'Hare, 1997).

Recent attempts at improving the extant literature of mandated student interventions have focused on the implementation of brief motivational interventions (e.g., Borsari & Carey, 2005; Fromme & Corbin, 2004; White et al., 2006). Though the investigations to date vary in terms of modality (individual versus group, individual versus electronic), quantity of sessions (one versus two), and length of intervention (from less than one hour to four hours), the literature is clearly supportive of interventions that utilize a motivational enhancement approach and incorporate cognitive-behavioral skills training and personalized drinking feedback. In a comprehensive review of the mandated student literature, Barnett and Read (2005) identified specific strategies

future investigations should use to fill key gaps in the knowledge base regarding effective mandated student interventions. Of particular importance were the inclusion of “referred students regardless of risk level,” as well as evaluations comparing the “efficacy of different intervention formats” (p. 156).

Though research supports the provision of interventions such as the BASICS and the ASTP, these face-to-face formats are not optimal for reaching large numbers of students and are costly to deliver. Fortunately, stand-alone feedback interventions also are supported by the research, are cost-effective, and can be disseminated easily to an entire college student population. No study to date has examined the relative effectiveness of all three commonly used intervention formats in a single research design. The current examination addressed this issue by comparing individual, group, and electronic formats, while adding to the literature by including a range of risk levels and drinking habits, from light-drinking through heavy alcohol use—not those solely defined as ‘heavy drinking.’ Additionally, this investigation is the first to provide participants with anonymity at both baseline and 3-month follow-up in an effort to minimize potential demand characteristics associated with adjudication. Building on the existing literature, the present study sought to address some of the current gaps by utilizing a randomized clinical trial (RCT) design to compare individual, group, and electronic feedback-based intervention formats on their effectiveness in reducing alcohol consumption and related negative consequences in a mandated student population.

Hypotheses

- 1) Participants in all three conditions will exhibit comparable reductions in alcohol consumption post intervention as evidenced by decreases in average and peak blood-alcohol content (BAC) levels, the average number of standard alcoholic drinks consumed per week, and the peak number of drinks consumed in one sitting as reported at follow-up.
- 2) Participants in all three conditions will exhibit comparable reductions in negative alcohol-related consequences post intervention as evidenced by a decrease in the total number of consequences reported at follow-up.

METHOD

Participants

A total of 360 participants were recruited for the study and completed the baseline assessment. Of those 360, 78 were dropped from the study for failing to complete the 3-month follow-up assessment within the allotted 2-week timeframe, 11 withdrew voluntarily from the study, and 2 could not be contacted at follow-up. The remaining sample included 269 undergraduate students at a large open-enrollment state university in the southeastern United States. Fifty-nine percent of the participants were male ($n = 159$) and ranged in age from 18 to 25 years, with a mean age of 19.20 ($SD = 1.06$). The sample distributions in the individual, group, and electronic conditions were 89 (57 males), 102 (59 males), and 78 (43 males), respectively. Self-reported participant race was 86% White, 7% “Other”, 3% Black, 2% Asian, 1% American Indian or Alaska Native, and 1% Native Hawaiian or Other Pacific Islander, with 90% classifying their ethnicity as Non-Latino/a. Participant class standing consisted of 30% freshmen, 51% sophomores, 15% juniors, and 4% seniors. The type of housing participants reported living in was comprised of 48% on-campus residence hall, 26% off-campus not with parents, 21% university-affiliated off-campus, 2% off-campus with parents, 2% “other” type of housing, and 1% reported living in a fraternity/sorority house.

Measures

Screening questionnaire

A screening instrument was developed to identify factors related to problematic and high-risk drinking and consisted of the Alcohol Use Disorders Identification Test (AUDIT; Saunders, Aasland, Babor, de la Fuente, & Grant, 1993; see Appendix B), assessing for alcohol dependence as defined by the Diagnostic and Statistical Manual, Fourth Edition, Text Revision (DSM-IV-TR; American Psychological Association, 2000), and inquiring about participation in prior, as well as current substance abuse treatment. The AUDIT is a widely used 10-item screening instrument that assesses hazardous drinking patterns by asking respondents to report drinking quantity and frequency, alcohol harms, and symptoms of alcohol dependence. Total scores range from 0 to 40, and are broken down into four ‘risk’ zones (Babor, Higgins-Biddle, Saunders, & Monteiro, 2001). When used with college students, the AUDIT has demonstrated internal consistency ranging from .77 (Neal & Carey, 2004) to .80 (Fleming, Barry, and McDonald, 1991), with several studies having used the AUDIT with mandated students in particular (Barnett et al., 2004; Borsari & Carey, 2005; O’Hare, 1997). See Appendix A for the screening questionnaire.

Demographics questionnaire

Participants were asked to provide general demographic information such as their age, sex, race, ethnicity, class standing, and type of housing (see Appendix C).

Alcohol Timeline Followback (TLFB)

Alcohol consumption was measured using the alcohol Timeline Followback procedure (TLFB; Sobell & Sobell, 1992). Respondents were provided with the definition of a 'standard alcoholic drink' (see Appendix D for a graphical description) and used assisted recall techniques to indicate the number of drinks consumed during each drinking occasion for the previous 4-week period. The TLFB provides detailed alcohol information such as peak and average blood alcohol content (BAC) levels, peak and average number of standard drinks consumed per week, and typical pattern of drinking (e.g., steady, binge). The TLFB is a well-established measure with good reliability and validity (Sobell, Brown, Leo, & Sobell, 1996; Sobell & Sobell, 1992; see Appendix D for a sample).

Blood alcohol content (BAC)

Blood alcohol content (BAC) was calculated using the same formula employed in a previous study with mandated students (Borsari & Carey, 2005):

$$\text{BAC} = [(\text{consumption} / 2) \times (\text{GC} / \text{weight})] - (0.016 \times \text{hours})$$

where consumption = the number of standard alcohol drinks consumed in one drinking session, hours = the number of hours over which drinks were consumed, weight = weight in pounds, and GC = gender constant (9.0 for women, 7.5 for men).

Negative alcohol-related consequences questionnaire

The 23-item Rutgers Alcohol Problem Index (RAPI; White & Labouvie, 1989) was the primary instrument used to assess alcohol-related harms, as it has demonstrated good internal consistency with adolescents (White & Labouvie, 1989), and with college student populations specifically (Borsari & Carey, 2000; Neal & Carey, 2004). In the standard version, answer

choices range from “never” (0) to “more than 10 times” (4), but because this study sought to obtain more detailed information regarding the harms mandated students may experience as a result of alcohol use, answer choices were modified such that respondents were asked to provide the actual number of times each harm occurred during the previous 30-days.

An additional eight items were included from the Drinker Inventory of Consequences (DrInC; Forcehimes, Tonigan, & Miller, 2007) to represent harms for which mandated students are typically referred for services, but which are not included on the RAPI (see Appendix E for additional items). The total negative alcohol-related consequences score was obtained by adding the number of times each harm was experienced (see Appendix E).

The Motivational Interviewing Treatment Integrity (MITI) Code

The most recent version of the Motivational Interviewing Treatment Integrity Code (MITI v. 3.0; Moyers, Martin, Manuel, Miller, & Ernst, 2007) was used to assess fidelity to motivational interviewing (MI) using a coding system that is comprised of six global scales (Evocation, Collaboration, Autonomy/Support, Direction, Empathy, & MI Spirit). Global scale ratings are derived by having trained raters select from among a five-point Likert scale ranging from “low” (1) to “high” (5) on each dimension, with the exception of the MI Spirit score, which is derived by taking the average of Evocation, Collaboration, and Autonomy/Support ratings.

Intervention conditions

Brief Alcohol Screening and Intervention for College Students (BASICS)

The Brief Alcohol Screening and Intervention for College Students (BASICS; Dimeff et al., 1999) is an individualized alcohol assessment and feedback intervention for college students

that was adapted from the Alcohol Skills Training Program (ASTP; Fromme et al., 1994). BASICS is designed for delivery in two 50-minute sessions that include cognitive-behavioral skills training, motivational enhancement, and harm-reduction principles. In the current study, intervention providers met with participants for an initial session to introduce the BASICS using a motivational enhancement approach (e.g., non-judgmental, empathic, non-confrontational style) and to gather assessment data that served as the personalized feedback information provided to each participant during the subsequent session. Personalized feedback included information about alcohol consumption, perceived drinking norms, alcohol-related problems, alcohol expectancies, and alcohol-related protective factors. Moderation training (e.g., setting limits, monitoring drinking, and managing drinking situations) also was included as part of the intervention.

CHOICES

CHOICES (Parks & Woodford, 2005) is a group alcohol intervention also adapted from the ASTP that, as a result, includes content similar to that found in the BASICS intervention. CHOICES uses a motivational enhancement framework to incorporate cognitive-behavioral skills training, psychoeducation, and harm-reduction principles delivered in the span of 120 minutes. In CHOICES, each participant is provided with a journal that illustrates intervention content to encourage an interactive journaling process meant to increase the level of participant engagement. In addition to the standard CHOICES protocol, this study provided each participant with the identical personalized alcohol feedback information used in the BASICS condition to maximize its similarity to the BASICS intervention content.

Electronic Check-Up to Go (e-CHUG)

The e-CHUG (Walters, Van Sickle, & Moyer, 2004) is an electronically-delivered alcohol intervention that utilizes social norms feedback theory and motivational interviewing techniques to motivate students to reduce their alcohol consumption via brief assessment of alcohol-related behaviors and beliefs such as typical consumption, level of alcohol tolerance, family history of alcohol-related problems, and perceived drinking norms. The e-CHUG provides immediate personalized feedback on an individual's alcohol risk and protective factors using the information obtained during the 15- to 20-minute assessment.

Procedure

Intervention provider training

Prior to the delivery of individual and group alcohol interventions, clinical psychology doctoral students underwent 40 hours of didactic training, as well as an additional 20 hours of experiential training. The principal investigator, who was certified as an intervention trainer, conducted the didactic sessions. The didactic portion of provider training included information about alcohol (e.g., standard drink equivalents, BAC), motivational interviewing (e.g., principles and techniques), the BASICS intervention (e.g., content, structure, drink monitoring cards), the CHOICES intervention (e.g., journal content, group dynamics), personalized feedback (e.g., content, how to deliver feedback), and general office policies and procedures (e.g., schedules, record keeping). Experiential training consisted of providers conducting mock sessions with undergraduate research assistants trained to be 'mandated' students. All sessions were videotaped, and each provider role-played sessions one and two of the BASICS intervention, as

well as facilitated a CHOICES group. The principal investigator reviewed all practice sessions, assessed for competence using the MITI code, and verified intervention content with a structured checklist tailored to each condition. The principal investigator provided individualized feedback based on intervention provider proficiency, and sessions were scheduled with study participants only once proficiency had been met. In an effort to address possible intervention ‘drift,’ weekly supervision sessions were held with providers that included discussions centered on motivational interviewing principles (e.g., techniques providers were using based on their client’s current stage of change), intervention content, and addressing questions that may have surfaced during intervention delivery.

MITI Code v. 3.0 rater training

A total of three independent raters, two senior-level undergraduate psychology research assistants and one first-year clinical psychology doctoral student, were trained by the principal investigator in the use of the MITI protocol. Raters were provided the MITI to study its content and indicated use, and subsequently met one-on-one with the principal investigator to discuss content, rating guidelines, and address any questions. As suggested in the MITI, all raters used two uncoded transcripts of motivational interviews from the Professional Training Series (Miller, Rollnick, & Moyers, 1998), which are made available online for training purposes, to practice global scale rating skills. Practice ratings were compared to coded transcripts by the principal investigator. Given that all three raters met MITI proficiency guidelines, random audiotape rating was initiated.

Study procedures

Participants who were at least 18 years-of-age were recruited for the study from the alcohol-related violation referrals to the Office of Alcohol and Other Drug Prevention Programming (OAODPP) at the University of Central Florida. Participants first completed an initial session with a clinical psychology doctoral student who administered the screening questionnaire. Participants were deemed ineligible to participate if they met criteria for Alcohol Dependence as delineated in the DSM-IV-TR (2000), fell into the highest risk category (Zone 4) on the AUDIT by scoring a 20 or higher, and/or endorsed previous or current substance abuse treatment for alcohol. Screeners reviewed the purpose and procedures of the study with those screened eligible to participate and informed participants that although they were mandated to receive alcohol screening and intervention services, they reserved the right not to respond to the 3-month follow-up survey online.

Participants were informed that there were no foreseeable risks involved with participation, that they maintained the right to withdraw from the study at any time without penalty, and that they would receive full reimbursement of the \$45.00 fee paid initially to receive services upon completion of the 3-month follow-up questionnaire as incentive for participation. In addition, participants in the individual and group conditions were informed that their session would be audiotaped for assessment of intervention integrity. Screeners informed participants that audiotapes would not contain their full name, would be stored in a locked file cabinet separate from study materials, would be accessed by the principal investigator and faculty supervisor of the current study only, and would be used solely for the purpose of rating intervention providers.

After a student agreed in writing to participate in the study by signing the informed consent form, they were assigned randomly to one of the three intervention conditions and asked

to complete the anonymous baseline questionnaire online via a secure web server. All participants completed baseline measures alone in a room dedicated for this purpose in the OAODPP. Surveys were linked from baseline to follow-up using a unique participant-generated code that could not be tied to their identity to ensure anonymity. Anonymity on baseline and follow-up measures was guaranteed in an effort to decrease socially desirable responding by an already vulnerable population. To date, no study has offered mandated students anonymity when completing self-report measures on behaviors related to their alcohol use.

In order to generate the personalized feedback report utilized during the second session of the individual and group interventions, participants assigned to those conditions were asked to complete a confidential paper-and-pencil self-report packet comprised of a different set of measures than those completed online, but which assessed similar behaviors, beliefs, and constructs. The paper-and-pencil packet included the assessment of alcohol-related behaviors and beliefs such as typical weekly consumption, peak 30-day consumption, protective behaviors, expectancies, perceived norms, and readiness to change. After the completion of indicated measures, participants were scheduled to return to the OAODPP for participation in their respective feedback intervention. Following participation in their respective intervention, participants were asked to complete the anonymous online follow-up questionnaire at 3-months post-intervention via an email reminder. Upon completion of the 3-month follow-up questionnaire, participants were debriefed as to the nature of the study in writing, and reimbursed the initial \$45.00 fee.

RESULTS

Power

On average, previous studies that have implemented the BASICS or provided personalized alcohol feedback via mail or electronic methods found medium effect sizes for drinking reduction (Neighbors, Larimer, and Lewis, 2004). Using the electronic power analysis program GPOWER (Erdfelder, Faul, & Buchner, 1996), a total sample size of 252, or 84 participants per condition, would be needed to demonstrate a statistically significant reduction in alcohol consumption given a medium effect size and three treatment conditions.

Outliers

Each of the dependent variables was screened for univariate outliers, defined as scores of greater than three standard deviations above or below the group mean. This procedure resulted in a total of 22 outliers greater than 3 standard deviations above the group mean across all four variables measuring alcohol use (pre-intervention = 11, post-intervention = 11), and 14 outliers above the mean for alcohol-related harms (pre-intervention = 6, post-intervention = 8). A conservative approach to preserve data integrity and information was applied and consisted of replacing outliers with the highest possible value within three standard deviations for each specific variable (i.e., group mean + 3 standard deviations).

Adherence to Motivational Interviewing (MI)

A total of 94 sessions (individual = 67, group = 27) were audiotaped for MI adherence. Of those audiotapes, 9 contained no audio, and 11 were inaudible. The remaining 74 audiotapes were pooled, and a random sample of 33 (45%) were selected for rating. Per the MITI Code v. 3.0 instructions, 20-minute segments were selected at random from each audiotape for coding. All 20-minute segments were transcribed, and each segment was coded twice by independent raters trained in the MITI scoring protocol.

Analyses indicated that all six global scales exceeded ‘beginner’ standards, and met criteria for ‘competence’ as defined by the MITI, with mean scores above 4 on the 5-point Likert scale (see Table 4). Based on previous work (Moyers, Martin, Manuel, Hendrickson, & Miller, 2005), the present study utilized the intra-class correlation coefficient (ICC) to determine inter-rater reliability for global scores on the MITI. The ICC categorization system described by Moyers and colleagues (2005) was used to assess the clinical utility of the present study’s ICCs. Both inter-rater reliability estimates and their respective categorizations are presented in Table 4.

Baseline differences

Given that the current study sought to modify factors associated with alcohol use, a dichotomous variable distinguishing ‘non-drinkers’ (participants who denied drinking at the baseline assessment) from ‘drinkers’ (participants who endorsed consuming alcohol) was computed such that no reported alcohol use at baseline = 0, and any endorsement of alcohol use = 1. A total of 209 participants provided sufficient alcohol use data during the baseline assessment for inclusion in the new ‘baseline drinking status’ variable. Subsequent analyses were conducted using only those participants who reported alcohol use at the baseline assessment.

The 173 participants selected based on pre-intervention drinking endorsement consisted of 57% males ($n = 98$) and ranged in age from 18 to 25 years, with a mean age of 18.77 ($SD = 1.08$). The sample distributions in the individual, group, and electronic conditions were 53 (35 males), 72 (41 males), and 48 (22 males), respectively. Self-reported participant race was 82% White, 9% “Other”, 4% Black, 4% Asian, and 1% American Indian or Alaska Native, with 91% classifying their ethnicity as Non-Latino/a. Participant class standing consisted of 69% freshmen, 21% sophomores, 6% juniors, and 4% seniors. The type of housing participants reported living in was comprised of 51% on-campus residence hall, 24% off-campus without parents, 20% university-affiliated off-campus, 2% off-campus with parents, 2% “other” type of housing, and 1% who reported living in a fraternity/sorority house (see Table 1).

Chi-square analyses were conducted on discrete participant characteristics of sex, race, ethnicity, class standing, and type of residence at baseline across treatment conditions. No significant differences were found. A univariate analysis of variance (ANOVA) was conducted to examine alcohol-related harms, which yielded no significant differences. A multivariate analysis of variance (MANOVA) was used to examine all dependent variables measuring alcohol use (i.e., average and peak BAC, average number of drinks consumed per week, and peak number of drinks consumed in one sitting) and indicated a significant difference among intervention groups at baseline for average BAC [$F(2, 174) = 3.159, p = .045$]. Given this finding, subsequent analyses examining between-group drinking changes for average BAC accounted for this difference as noted below.

Changes in negative alcohol-related consequences

A 3 (individual, group, and electronic intervention) x 2 (pre-intervention, 3-month follow-up) mixed-model ANOVA was conducted on the total number of alcohol-related harms reported in a 4-week period. Results revealed a significant main effect of time [$F(1, 165) = 10.460, p < .001$]. Simple effects tests indicated significant reductions in alcohol-related harms from pre- to post-intervention in the individual [$F(1, 165) = 7.308, p = .008$; within-group (WG) effect size (Cohen's d) = .41] and electronic [$F(1, 165) = 7.214, p = .008$; WG effect size (Cohen's d) = .40] conditions, with participants experiencing an average decrease in harms of 8.92 and 9.04, respectively (see Table 2). No significant condition by time interaction was found. Results were not significant for the group condition (see Figure 1).

Changes in alcohol consumption

Changes in alcohol consumption were measured using 3 (individual, group, and electronic intervention) x 2 (pre-intervention, 3-month follow-up) mixed-model ANOVAs for each drinking variable. Participants who reported no alcohol use during the previous 4-week period at baseline were excluded from analyses measuring drinking changes pre- to post-intervention (see Table 3 for a summary of results).

Average blood alcohol content (BAC) over a 4-week period

Average BAC was calculated using the following formula: Average BAC = (average weekly BAC / # of drinking weeks) where average weekly BAC = the sum of all BACs over one week divided by the number of drinking occasions in that week, and # of drinking weeks = the number of weeks containing at least one drinking occasion. Due to significant baseline

differences across conditions for average BAC, a univariate analysis of covariance (ANCOVA) was performed with baseline average BAC levels as the covariate to examine potential differences at post-intervention across groups. No significant between-group differences were found. A significant main effect of time was noted [$F(1, 166) = 4.129, p = .044$], with further simple effects analyses that indicated trends toward significant reductions in average BAC pre- to post-intervention for the individual [$F(1, 166) = 3.561, p = .061$; WG effect size (Cohen's d) = .29] and group [$F(1, 166) = 3.791, p = .053$; WG effect size (Cohen's d) = .23] conditions (see Figure 2). No significant condition by time interaction was found. Per the power analysis conducted prior to study commencement, it is plausible that statistically significant within-group reductions could have been achieved given a greater number of study participants per condition.

Peak blood alcohol content (BAC) over a 4-week period

Peak BAC was determined by selecting the single highest BAC reached during the 4-week time period. A significant main effect of time was found for peak BAC [$F(1, 166) = 5.098, p = .025$], with reductions pre- to post-intervention in the individual condition [$F(1, 166) = 6.304, p = .013$; WG effect size (Cohen's d) = .45]. Participants in the individual condition experienced an average decrease in peak BAC of 0.03, or the approximate equivalent of consuming one standard alcoholic drink. No significant condition by time interaction was found. It was noted that decreases in the group condition approached significance [$F(1, 166) = 3.770, p = .054$; WG effect size (Cohen's d) = .23]. Results for the electronic condition were not significant (see Figure 3).

Average number of drinks consumed per week over a 4-week period

The average number of drinks consumed per week was calculated using the following formula: Average # of drinks per week = sum of (total # of drinks per drinking occasion) / total # of drinking occasions where sum of (total # of drinks per drinking occasion) = addition of all drinking episode totals, and total # of drinking occasions = the total number of days alcohol was consumed over the 4-week period. Analyses revealed no significant within- or between-subjects effects in the average number of drinks consumed per week (see Figure 4).

Peak number of drinks consumed in one sitting over a 4-week period

Analyses indicated a significant main effect of time for peak number of drinks consumed in one sitting [$F(1, 166) = 4.517, p = .035$], with significant reductions pre- to post-intervention in the individual condition [$F(1, 166) = 7.079, p = .009$; WG effect size (Cohen's d) = .33]. Participants in the individual condition experienced an average decrease of 1.5 standard alcoholic drinks consumed during a single drinking occasion. No significant condition by time interaction was found. Results for the group and electronic conditions were not significant (see Figure 5).

DISCUSSION

The present study sought to contribute meaningful information to the growing body of literature concerning brief alcohol interventions for mandated student populations. This is the first randomized clinical trial to compare an individually-delivered personalized alcohol feedback intervention that is well supported (Dimeff et al., 1999), with more cost-effective group- and electronically-delivered feedback formats within a single research design. Despite the typical convention of including only ‘heavy’ drinking college students in brief intervention studies (i.e., Borsari & Carey, 2005; Fromme & Corbin, 2004), the present investigation expanded the range of drinking habits reported at baseline to include, for example, participants whose average drinks per week fell below one standard drink, to those who averaged 25 drinks per week. Additionally, given the potential demand characteristics to underreport illegal and/or illicit behaviors, this is the first study to my knowledge that provided mandated participants with anonymity.

The first aim of the present study was to examine the effectiveness of each feedback intervention format on the reduction of alcohol use. I hypothesized that all three interventions would significantly decrease alcohol consumption, which was not supported. Participant alcohol use was assessed using several drinking variables in an effort to obtain a more specific understanding of alcohol use patterns. Examination of average and peak BAC, the average number of drinks consumed per week, and the peak number of drinks consumed in one sitting revealed that feedback delivered individually in a face-to-face format is effective in decreasing alcohol use—specifically alcohol consumed in larger amounts. The individual intervention produced significant reductions in the highest number of drinks consumed during a single drinking occasion, as well as peak BAC. These findings are consistent with extant research that supports the use of the BASICS with college students (i.e., Baer et al., 2001; Borsari & Carey,

2005; Murphy et al., 2004), and points to the utility of this intervention in reducing more hazardous drinking habits. Despite what may seem as modest decreases in peak BAC (0.03) and drinks consumed (1 ½ standard alcoholic drinks), such reductions can mean the difference between a driving under the influence (DUI) charge, or moving from a BAC that produces a sense of ‘relaxation’ to one of ‘impaired’ judgment. Although statistical significance was not achieved, there was a trend toward a significant reduction of alcohol use for the individual and group conditions on average BAC, and for the group condition on peak BAC. No significant alcohol use decreases were found for the electronic intervention.

One reason for the differential treatment effects on alcohol reduction may be found in the personalized feedback content of the electronic condition. Both the individual and group conditions were derived from the efficacious Alcohol Skills Training Program (Kivlahan et al., 1990) and contain specific harm reduction drinking strategies aimed at managing alcohol use effectively (e.g., alternating alcoholic drinks with non-alcoholic drinks, pacing and spacing drinks), whereas the electronic condition did not. A recent meta-analytic review examining alcohol interventions in college student populations (Carey, Scott-Sheldon, Carey, & DeMartini, 2007) supports the present findings, citing risk reduction strategies such as those provided in the individual and group conditions, as factors that contribute to students engaging in “less extreme drinking behavior” (p. 2487). Also, because the individual and group interventions were conducted in a face-to-face format, it was possible to confirm that the provision of feedback and discussion of report contents (e.g., BAC, tolerance, comparison of own drinking to others) occurred during every feedback session. The very nature of the remote feedback delivery in the electronic condition precludes the verification that participants reviewed their personalized feedback reports at the time of the intervention.

Due to the greater likelihood of mandated students experiencing harms associated with alcohol use when compared to their non-mandated peers (Caldwell, 2002; LaBrie, Tawalbeh, & Earleywine, 2006), the second aim was to examine the impact of feedback interventions on negative alcohol-related consequences. I hypothesized that all three feedback interventions would reduce alcohol-related harms; however, this hypothesis was not supported. Significant reductions in harms were noted solely in the individual and electronic conditions. The present findings are consistent with previous research (e.g., Baer et al., 2001) that the BASICS intervention reduces both alcohol use and alcohol-related harms—a finding that is not surprising given the wide-spread use and research of the BASICS intervention within college student populations. What is interesting, however, is the positive impact of the electronic intervention on the reduction of alcohol-related harms, given the lack of significant reductions in drinking. A study examining the independent and collective roles of personalized feedback and motivational interviewing found similar results, with students exhibiting reductions in the amount of negative consequences experienced related to alcohol use, without concomitant reductions in drinking (Juarez, Walters, Daugherty, & Radi, 2006).

Further examination of the content included in the electronic feedback intervention may shed light on the decrease in alcohol harms despite the absence of drinking changes. First, although topics concerning drinking (e.g., BAC, tolerance) were present in the e-CHUG feedback report, there were no specific ‘tips’ or strategies focused on reducing alcohol consumption. In fact, the feedback report provided participants personalized information related to alcohol use in an objective, factual, and non-judgmental manner, steering clear of direct attempts to modify drinking behavior. The use of such an approach allows the e-CHUG to remain consistent with MI (Miller & Rollnick, 2002) principles. Second, closer inspection of the e-CHUG feedback report revealed specific references to the number and type of alcohol-related

consequences a participant had experienced, with an additional chart that detailed statistics related to drinking and driving. Moreover, although the e-CHUG did not present participants with harm reduction drinking strategies, it did provide harm reduction drinking and driving strategies by offering specific referral information when a designated driver is needed (e.g., the university-sponsored taxi cab program). It is possible that similar to offering participants drinking strategies, providing them with safer drinking and driving strategies served to decrease the occurrence of those specific types of alcohol-related incidents, which in turn led to the observed significant decreases in harms.

The use of identical feedback reports in the individual and group conditions was implemented to maximize intervention similarity despite differences in delivery format, and yet a discrepancy in negative alcohol-related harms was observed. Although perplexing, moderator analyses conducted in the aforementioned meta-analytic review (Carey et al., 2007) bolster the findings in the present study. The review concluded that interventions which incorporate MI, normative drinking comparisons, feedback on expectancies, a decisional balance exercise (all of which are included in this investigation's feedback report), and are delivered in an individual format, outperform those delivered in a group format on the reduction of harms (Carey et al., 2007). Additionally, a comprehensive review of 'peer contagion' (i.e., influence of peers resulting in null or iatrogenic intervention effects) within adolescent populations highlighted the potential for group interventions conducted with deviant youth to dampen positive intervention outcomes at best, and foster negative effects at worst (Dishion & Dodge, 2005). Mandated students who have been sanctioned, by the university and/or the law, are by virtue of their offense(s) considered 'deviant' from their non-adjudicated peers—a finding that is supported by data that mandated students experience higher rates of harms (Caldwell, 2002; Flynn & Brown, 1991; LaBrie, Tawalbeh, & Earleywine, 2006). Furthermore, the group intervention in the

present study was implemented as a ‘selected prevention strategy,’ or one geared towards high-risk youth in an effort to prevent the worsening of target behaviors. According to Dishion and Dodge (2005), using a group intervention in such a population can be particularly problematic when the group includes adolescents who are “moderately deviant or are still developing deviant behavior patterns” due to peer contagion effects (p. 396). The grouping of youth who have engaged in deviant behavior may serve to normalize the experience, contributing to the absence of positive behavior change. Lastly, it is also possible that expected reductions in problem behaviors were not demonstrated in the group condition because the intervention utilized in this study (see Parks & Woodford, 2005) was originally developed for use as a primary prevention strategy, and not a selected prevention strategy geared towards known at-risk youth.

Given that the face-to-face interventions in the current investigation incorporated MI principles, fidelity to MI was assessed using a standardized protocol (MITI; Moyers et al. 2007) and trained independent raters. Findings suggest that face-to-face interventions were successful in keeping with global MI principles such as empathy, autonomy and support, and the overarching MI spirit (Miller & Rollnick, 2002). Variability in inter-rater reliability for global scales was noted, however, which merits discussion. In an attempt to accomplish precise and thorough ratings, the principal investigator had session excerpts transcribed. Following transcription, trained raters were instructed to follow along visually using the transcription while they listened to the corresponding audiotape of the session. Although these steps were taken in an effort to maximize rating accuracy, it is possible that modifying the MITI protocol, which instructs raters to listen to the excerpt in its entirety to obtain an overall impression (‘gestalt’) of the session, resulted in rating differences. The modification in method from solely auditory to a mixed visual and auditory format may have influenced some raters to attend to different aspects of the intervention. For example, while one rater may have focused more so on the actual words

on the page, shifting (and perhaps missing) the intended message of the session, another may have attended to the tone, delivery, and exchange of the provider and participant. Research on learning styles and memory has demonstrated that information presented in a person's preferred learning style enhances both learning and recall of the information (Korenman & Peynircioglu, 2007). Also, despite the initial training and assessment of raters for competence in the MITI rating protocol prior to its use, regular checks for continued competence were not conducted. Differential rater 'drift' could have occurred during the course of the study, which also may have contributed to variable inter-rater reliability estimates.

The present study offers valuable new information to the existing literature regarding alcohol interventions that target mandated college student populations. The very use of underutilized methodological techniques that add to this study's strengths, however, also contribute to some of its limitations. First, the decision to employ a randomized clinical trial (RCT) of three active interventions allowed for the comparison of varying delivery formats on the effectiveness of personalized alcohol feedback within one research design. The comparison of three active treatments, however, cannot rule out the effect of time or the sanction itself on the modification of behavior—though the use of a no-treatment control or wait-list condition would have introduced ethical problems given the high-risk nature of this particular population. Second, although anonymity may have lessened the degree to which demand characteristics influenced outcomes, it also precluded our ability to examine other potentially helpful information, such as rates of academic retention and recidivism. In addition, anonymity allowed participants to complete baseline measures in the Office of Alcohol and Other Drug Prevention Programming alone in a private office, but follow-up measures were completed remotely via an online connection at the participant's convenience. The possibility exists that despite the guarantee of anonymity, participants were still influenced by the location of the initial assessment, and

reported with increased accuracy during the follow-up assessment in the absence of a university presence. Following the same line of thought, participants who questioned the maintenance of their anonymity may have reported inaccurate information on the confidential paper-and-pencil measures, which provided the content for their personalized alcohol feedback report. Given this possibility, personalized information may not have contained the level of relevance necessary to influence positive behavior change. Third, the use of a 3-month follow-up assessment limits the ability to determine the long-term impact of these interventions. Per the recent college student meta-analysis, time of follow-up changes the result of outcome data depending on the behavior being measured, with some behaviors faring better at a short-time follow-up, and others during longer assessment periods (Carey et al., 2007). Lastly, though initial recruitment efforts met the guidelines set forth by the *a priori* power analysis to detect intervention effects, the loss of participants at follow-up, coupled with participants failing to endorse any alcohol use during the baseline assessment, resulted in a sample size smaller than suggested. The ability of the present study to detect changes in drinking and harms despite these limitations, however, speaks to the encouraging findings this examination provides.

Future investigations focused on improving services for mandated college students would benefit from replicating the findings of this study using an anonymous data collection design, while increasing the recruitment of students who report drinking behavior following the incident. Extending the follow-up period of these interventions with mandated students would also contribute to our understanding of the longer-term effects these interventions may have. Given the high cost of delivering face-to-face services, a cost-effectiveness analysis (see Kaplan & Frosch, 2005, for a review) would inform institutions of higher education looking to maximize clinical gains. Research findings continue to suggest that it is the personalized feedback itself, and not MI, which influences problematic behaviors (i.e., Juarez et al., 2006; Murphy et al.,

2004), but dismantling studies to date have not included mandated students. Therefore, incorporating personalized feedback and mandated students in future dismantling studies would assist with determining whether mandated students derive similar benefits as compared to their non-mandated counterparts. Lastly, the reduction in higher drinking levels (i.e., peak BAC) within intervention conditions that incorporated harm reduction drinking strategies points to the utility of measuring these behaviors in future investigations. Although a recent study by Larimer and colleagues (2007) using feedback with embedded drinking strategies found a mediating effect of protective drinking behaviors on alcohol use, the study was not conducted on mandated students. The one study to date that has examined the mediational relationship of protective behaviors on drinking in mandated students (Barnett, Murphy, Colby, & Monti, 2007), did not incorporate a control group with which to compare their findings. In sum, although the present study contributes to the mandated student literature, there is still much work that can be accomplished.

Table 1. Participant Demographics by Intervention Condition

	Individual Intervention		Group Intervention		Electronic Intervention	
	% / \bar{X} (SD)	<i>n</i>	% / \bar{X} (SD)	<i>n</i>	% / \bar{X} (SD)	<i>n</i>
Age	18.79 (1.12)	53	18.79 (1.23)	72	18.71 (0.74)	48
Sex						
Male	66	35	57	41	46	22
Female	34	18	43	31	54	26
Race						
Non-Hispanic/ Latino(a)	94	50	90	65	92	44
Hispanic/Latino(a)	6	3	10	7	8	4
Ethnicity						
American Indian/ Alaska Native	0	0	0	0	4	2
Asian	4	2	3	2	4	2
Black	6	3	1	1	7	3
White	83	44	86	62	75	36
Other/Prefer Not to Respond	7	4	10	7	10	5
Class Standing						
Freshman	72	38	65	47	71	34
Sophomore	13	7	24	17	25	12
Junior	7.5	4	7	5	4	2
Senior	7.5	4	4	3	0	0
Type of Residence						
On-Campus Residence Hall	51	27	47	34	58	28
Fraternity/ Sorority House	0	0	3	2	0	0
University- Affiliated	19	10	22	16	17	8
Off-Campus Off-Campus Without Parents	24.5	13	25	18	23	11
Off-Campus With Parents	3.5	2	1.5	1	0	0
Other	2	1	1.5	1	2	1

Table 2. Means and Standard Deviations for Measure of Negative Alcohol-Related Consequences at Baseline and 3-Month Follow-Up

	Individual Intervention (n = 53)		Group Intervention (n = 72)		Electronic Intervention (n = 48)	
	Baseline	Follow-up	Baseline	Follow-up	Baseline	Follow-up
Negative Alcohol-Related Consequences	21.26 (23.19)	12.33 (20.11)**	17.87 (22.30)	18.00 (27.01)	19.00 (23.85)	9.18 (17.44)**

Note: ** = $p < 0.01$

Table 3. Means and Standard Deviations for Measures of Alcohol Use at Baseline and 3-Month Follow-Up

Measure of Alcohol Use	Individual Intervention (n = 53)		Group Intervention (n = 72)		Electronic Intervention (n = 48)	
	Baseline	Follow-up	Baseline	Follow-up	Baseline	Follow-up
Average BAC	.061 (.047)	.048 (.041)	.073 (.051)	.062 (.050)	.050 (.044)	.050 (.051)
Peak BAC	.112 (.093)	.082 (.070)*	.125 (.088)	.105 (.083)	.092 (.094)	.096 (.099)
Average Number of Drinks Per Week	5.99 (6.68)	5.04 (6.20)	7.04 (6.42)	7.82 (8.33)	4.22 (4.28)	6.64 (7.99)
Peak Number of Drinks Consumed in One Sitting	7.02 (5.00)	5.49 (4.23)**	7.46 (4.53)	6.73 (4.88)	6.38 (4.03)	6.55 (5.41)

Note: * = $p < 0.05$, ** = $p < 0.01$

Table 4. Means, Standard Deviations, and Reliability Estimates for the MITI Code v. 3.0

Global Scale	\bar{x} (n = 33)	(SD)	ICC	Category
Evocation	4.26	.66	.680	Good
Collaboration	4.53	.56	.543	Fair
Autonomy/Support	4.47	.56	.289	Poor
Direction	4.68	.50	.151	Poor
Empathy	4.48	.50	.451	Fair

Negative Alcohol-Related Consequences by Time and Condition

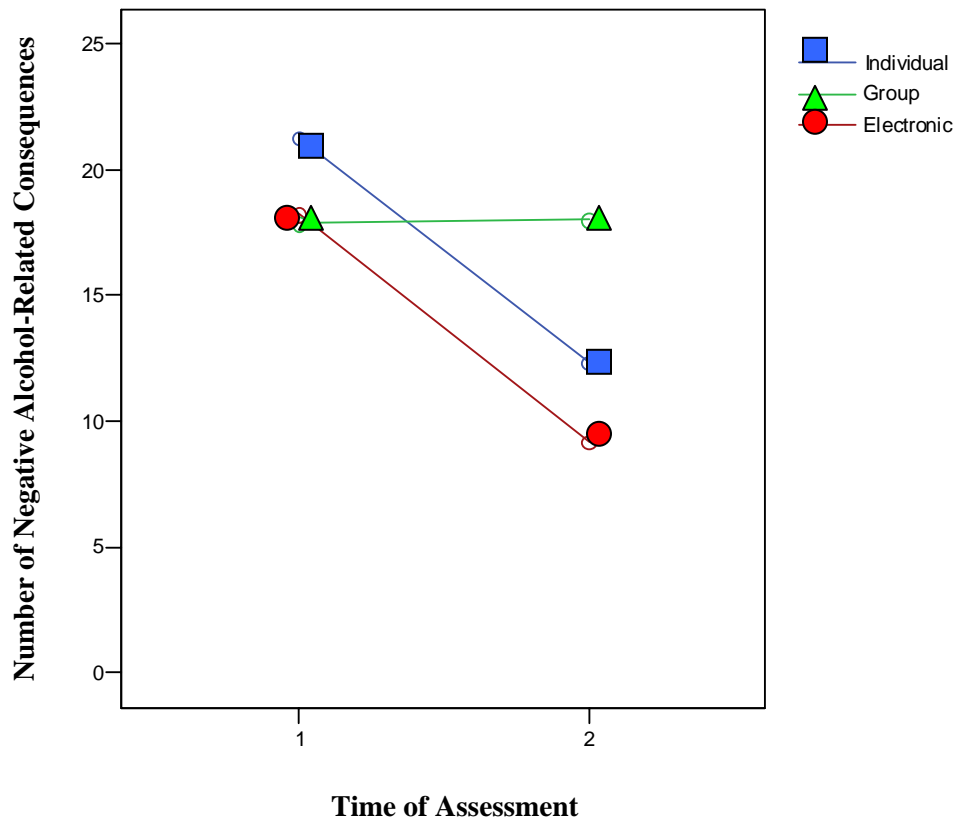


Figure 1. Number of negative alcohol-related consequences at (1) baseline and (2) 3-month follow-up

**Average Blood Alcohol Content (BAC)
by Time and Condition**

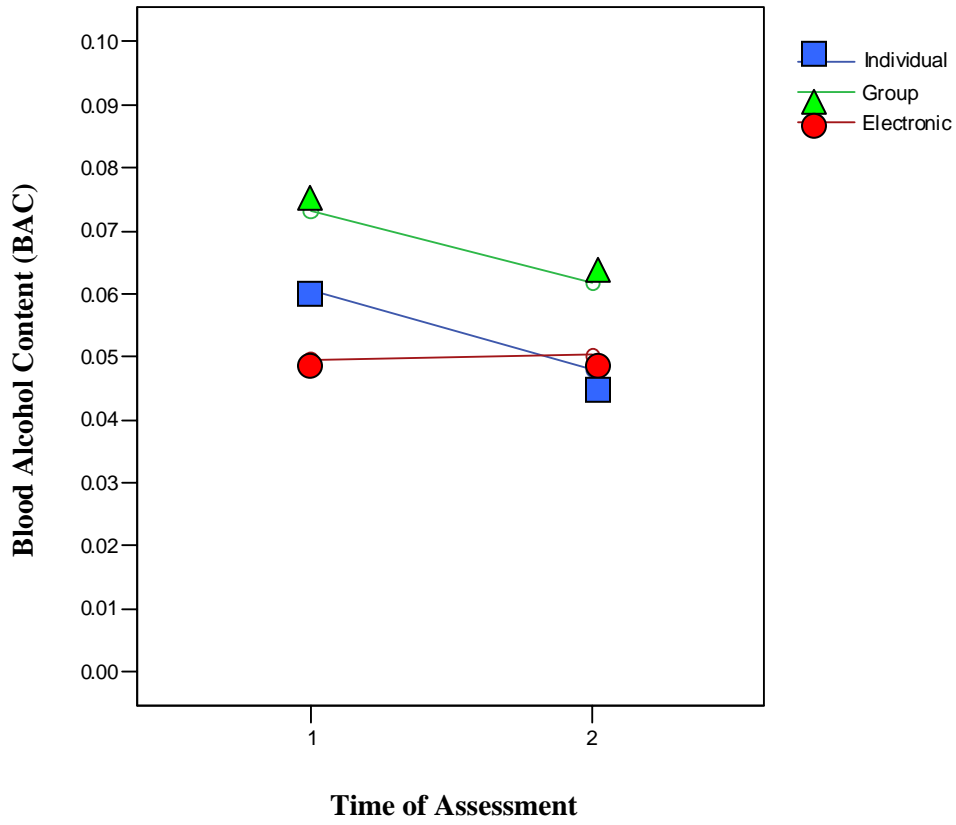


Figure 2. Average blood alcohol content (BAC) at (1) baseline and (2) 3-month follow-up

Peak Blood Alcohol Content (BAC) by Time and Condition

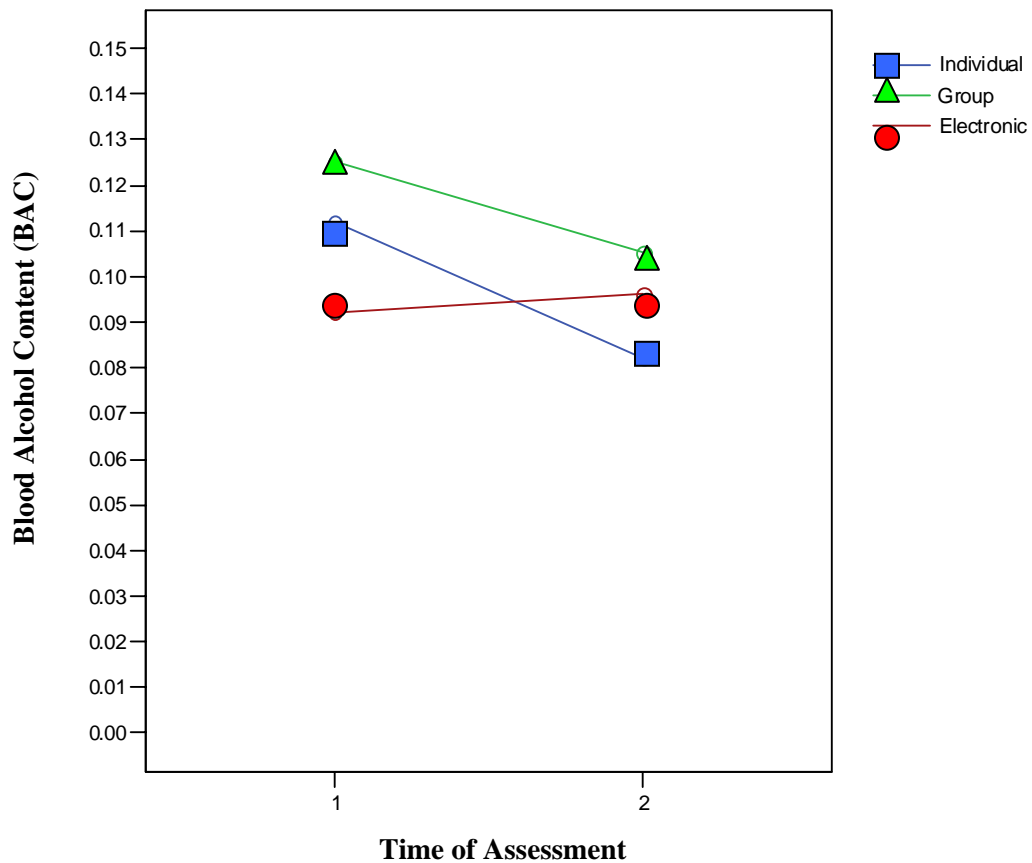


Figure 3. Peak blood alcohol content (BAC) at (1) baseline and (2) 3-month follow-up

**Average Number of Drinks Consumed Per Week
by Time and Condition**

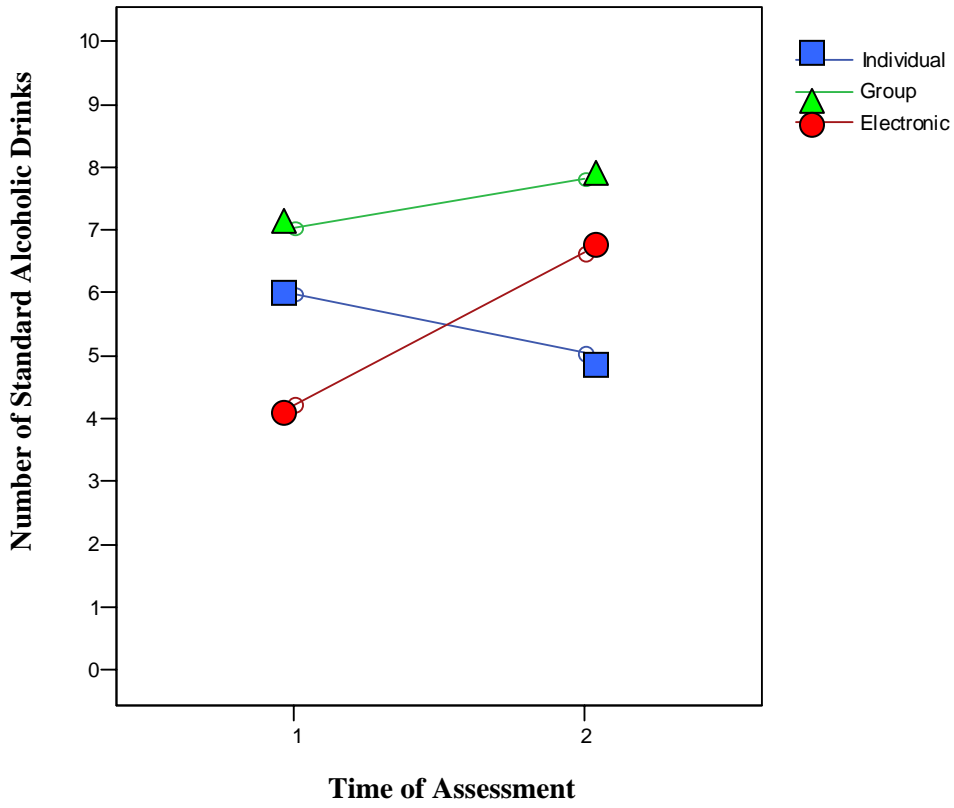


Figure 4. Average number of drinks consumed per week at (1) baseline and (2) 3-month follow-up

**Peak Number of Drinks Consumed in One Sitting
by Time and Condition**

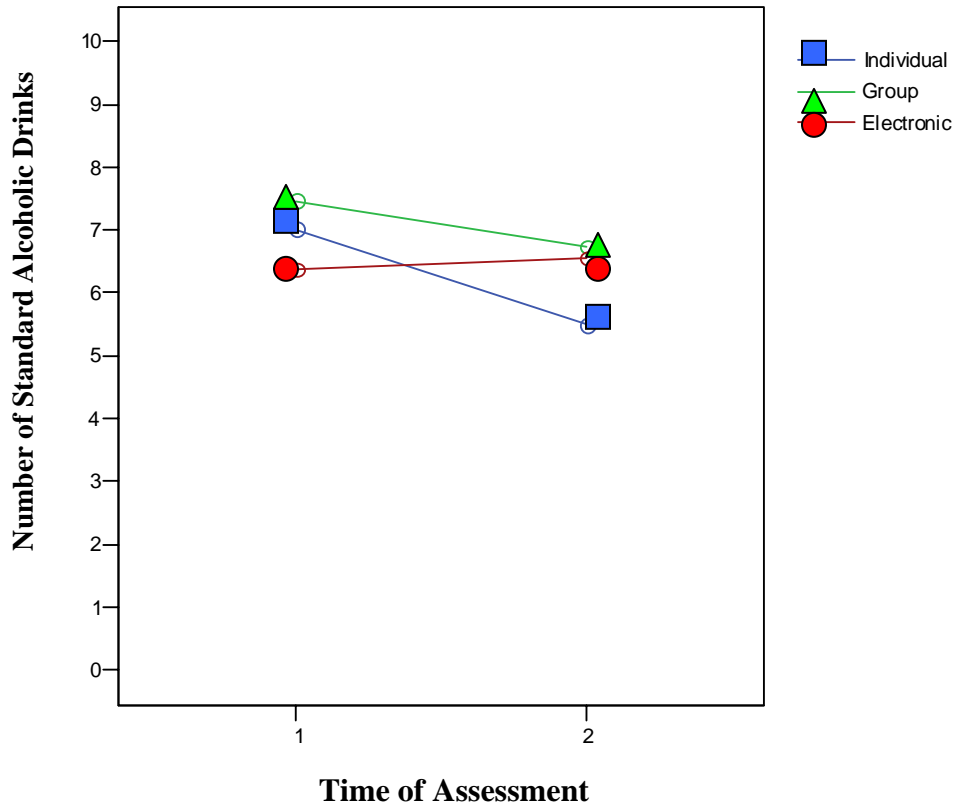


Figure 5. Peak number of drinks consumed in one sitting at (1) baseline and (2) 3-month follow-up

APPENDIX A: SCREENING INSTRUMENT

For Office Use Only:
Name of screening administrator:

For Office Use Only:
Level of violation:
1 2 3 4

For Office Use Only:
Specific violation(s):

Demographics

A.1. Name:	A.2. Date:	A.3. How old are you? _____
------------	------------	-----------------------------

<p>A.4. Your mailing address:</p> <p>A.5. Your phone number (where we can call you for reminders): () -</p> <p>Can we leave messages for you at this number? <input type="checkbox"/> YES <input type="checkbox"/> NO</p>	<p>A.6. Your email address (used for reminders): _____</p> <p>Can we use your email address to send reminder messages? <input type="checkbox"/> YES <input type="checkbox"/> NO</p>
---	--

1. Are you drinking alcohol daily, nearly daily, or several times a day? YES NO
 - a. If NO, have you done so in the last 12 months? YES NO
2. Do you spend a great deal of your time thinking about alcohol, acquiring it, preparing to drink, and drinking alcohol? YES NO
 - a. If NO, have you done so in the last 12 months? YES NO
3. Have you continued to drink alcohol despite any legal, social, school, work, or health problems that drinking alcohol has cost you? YES NO
 - a. If NO, have you done so in the last 12 months? YES NO
4. Have you reduced or given up other activities or relationships with friends or family because of your alcohol use? YES NO
 - a. If NO, have you done so in the last 12 months? YES NO

5. Have you found that over time you have needed to drink more alcohol than you used to in order to get drunk or that the same amount of alcohol affects you less? YES NO
- a. If NO, have you done so in the last 12 months? YES NO
6. Have you ever tried to cut down or quit drinking alcohol without success? YES NO
- a. If NO, have you done so in the last 12 months? YES NO
7. Have you ever drank alcohol when you were trying to avoid any negative effects of trying to cut down or quit use altogether? YES NO
- a. If NO, have you done so in the last 12 months? YES NO

For Office Use Only TOTAL: _____ / 7

8. Have you ever participated in substance use treatment? YES NO
If yes, please describe:

9. Have you ever thought of hurting yourself, or hurt yourself intentionally in any way? YES NO
- a. If YES, please describe:

10. Have you ever thought of seriously injuring or killing someone else? YES NO
- a. If YES, please describe:

APPENDIX B: ALCOHOL USE DISORDERS IDENTIFICATION TEST (AUDIT)

Questions	0	1	2	3	4	
1. How often do you have a drink containing alcohol?	Never	Monthly or less	2-4 times a month	2-3 times a week	4 or more times a week	
2. How many drinks containing alcohol do you have on a typical day when you are drinking?	1 or 2	3 or 4	5 or 6	7 to 9	10 or more	
3. How often do you have six or more drinks on one occasion?	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 had started?	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 of you because of drinking?	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?	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?	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 of your drinking?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily	
9. Have you or someone else been injured because of your drinking?	No		Yes, but not in the last year		Yes, during the last year	
10. Has a relative, friend, doctor, or other health care worker been concerned about your drinking or suggested you cut down?	No		Yes, but not in the last year		Yes, during the last year	
					Total	

APPENDIX C: DEMOGRAPHICS

A.1. Gender

- a. Male
- b. Female
- c. Trans gendered

A.2. Living Arrangement (mark best answer):

- a. Residence Hall
- b. Fraternity or sorority
- c. Off-campus house/apartment (no parents)
- d. Off-campus house/apartment (w/parents)
- e. University-affiliated housing
- f. Other: _____

A.3. Ethnicity:

- a. Hispanic/Latino(a)
- b. Non-Hispanic/Latino(a)

A. 4. Race:

- a. American Indian/Alaska Native
- b. Asian
- c. Black/African American
- d. Native Hawaiian/Other Pacific Islander
- e. White/Caucasian
- f. Other: _____

A. 5. Classification

- a. Freshman
- b. Sophomore
- c. Junior
- d. Senior
- e. Post-Bac/Grad Student

A.6. Height: _____ A.7. Weight: _____(estimate in pounds)

A.8. How fair do you feel your sanction is on a scale of 1 to 6?

1	2	3	4	5	6
Completely Unfair	Mostly Unfair	Slightly Unfair	Slightly Fair	Mostly Fair	Completely Fair

A.9. How personally responsible do you feel for the violation?








1	2	3	4	5	6
Completely NOT Responsible	Mostly NOT Responsible	Slightly NOT Responsible	Slightly Responsible	Mostly Responsible	Completely Responsible

APPENDIX D: ALCOHOL TIMELINE FOLLOWBACK

	A	B	C	D	E	F	G	H
1	ID	A892MI						
2	Factor	9						
3	Weight	125						
4								
5	Day	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
6	Date	06/15/08	06/16/08	06/17/08	06/18/08	06/19/08	06/20/08	06/21/08
7	Drink (1=yes; no leave blank)					1	1	1
8	# drinks					4	8	2
9	over __ hrs					2	4	2
10	BAC:	0.0000	0.0000	0.0000	0.0000	0.1100	0.2200	0.0380
11								
12	Day	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
13	Date	06/22/08	06/23/08	06/24/08	06/25/08	06/26/08	06/27/08	06/28/08
14	Drink (1=yes; no leave blank)	1						
15	# drinks	3						
16	over __ hrs	2						
17	BAC:	0.0740	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
18								
19	Day	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
20	Date	6/29/2008	6/30/2008	7/1/2008	7/2/2008	7/3/2008	7/4/2008	7/5/2008
21	Drink (1=yes; no leave blank)						1	
22	# drinks						5	
23	over __ hrs						2	
24	BAC:	0.0000	0.0000	0.0000	0.0000	0.0000	0.1460	0.0000
25								
26	Day	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
27	Date	7/6/2008	7/7/2008	7/8/2008	7/9/2008	7/10/2008	7/11/2008	7/12/2008
28	Drink (1=yes; no leave blank)					1		
29	# drinks					4		
30	over __ hrs					4		
31	BAC:	0.0000	0.0000	0.0000	0.0000	0.0760	0.0000	0.0000

What's a Standard Drink?

A standard drink in the United States is any drink that contains about 14 grams of pure alcohol (about 0.6 fluid ounces or 1.2 tablespoons). Below are U.S. standard drink equivalents. These are approximate, since different brands and types of beverages vary in their actual alcohol content.

<p>12 oz. of beer or cooler</p>  <p>~5% alcohol</p>	<p>8–9 oz. of malt liquor 8.5 oz. shown in a 12-oz. glass that, if full, would hold about 1.5 standard drinks of malt liquor</p>  <p>~7% alcohol</p>	<p>5 oz. of table wine</p>  <p>~12% alcohol</p>	<p>3–4 oz. of fortified wine (such as sherry or port) 3.5 oz. shown</p>  <p>~17% alcohol</p>	<p>2–3 oz. of cordial, liqueur, or aperitif 2.5 oz. shown</p>  <p>~24% alcohol</p>	<p>1.5 oz. of brandy (a single jigger)</p>  <p>~40% alcohol</p>	<p>1.5 oz. of spirits (a single jigger of 80-proof gin, vodka, whiskey, etc.) Shown straight and in a highball glass with ice to show the level before adding a mixer*</p>  <p>~40% alcohol</p>
<p>12 oz.</p>	<p>8.5 oz.</p>	<p>5 oz.</p>	<p>3.5 oz.</p>	<p>2.5 oz.</p>	<p>1.5 oz.</p>	<p>1.5 oz.</p>

APPENDIX E: NEGATIVE ALCOHOL-RELATED CONSEQUENCES QUESTIONNAIRE

R.A.P.I.

Different things happen to people when 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 3 years while you were drinking alcohol or as the result of your alcohol use. When marking your answers, use the following code:

0 = never

1 = 1-2 times

2 = 3-5 times

3 = 6-10 times

4 = more than 10 times

How many times did the following things happen to you while you were drinking alcohol or because of your alcohol use during the last 3 years?

- | | | | | | |
|---|---|---|---|---|--|
| 0 | 1 | 2 | 3 | 4 | Not able to do your homework or study for a test |
| 0 | 1 | 2 | 3 | 4 | Got into fights, acted bad, or did mean things |
| 0 | 1 | 2 | 3 | 4 | Missed out in other things because you spent too much money on alcohol |
| 0 | 1 | 2 | 3 | 4 | Went to work or school high or drunk |
| 0 | 1 | 2 | 3 | 4 | Caused Shame or embarrassment to someone |
| 0 | 1 | 2 | 3 | 4 | Neglected your responsibilities |
| 0 | 1 | 2 | 3 | 4 | Relatives avoided you |
| 0 | 1 | 2 | 3 | 4 | Felt that you needed more alcohol than you used to use in order to get the same effect |
| 0 | 1 | 2 | 3 | 4 | Tried to control your drinking by trying to drink only at certain times of day or certain places |
| 0 | 1 | 2 | 3 | 4 | Had withdrawal symptoms, that is, felt sick because you stopped or cut down on drinking |
| 0 | 1 | 2 | 3 | 4 | Noticed a change in your personality |
| 0 | 1 | 2 | 3 | 4 | Felt that you had a problem with school |
| 0 | 1 | 2 | 3 | 4 | Missed a day (or part of a day) of school or work |
| 0 | 1 | 2 | 3 | 4 | Tried to cut down on drinking |
| 0 | 1 | 2 | 3 | 4 | Suddenly found yourself in a place that you could not remember getting to |
| 0 | 1 | 2 | 3 | 4 | Passed out or fainted suddenly |
| 0 | 1 | 2 | 3 | 4 | Had a fight, argument, or bad feelings with a friend |
| 0 | 1 | 2 | 3 | 4 | Had a fight, argument or bad feelings with a family member |
| 0 | 1 | 2 | 3 | 4 | Kept drinking when you promised yourself not to |
| 0 | 1 | 2 | 3 | 4 | Felt you were going crazy |
| 0 | 1 | 2 | 3 | 4 | Had a bad time |
| 0 | 1 | 2 | 3 | 4 | Felt physically or physiologically dependent on alcohol |
| 0 | 1 | 2 | 3 | 4 | Was told by a friend or neighbor to stop or cut down drinking |

Supplementary Questions Selected from the Drinker Inventory of Consequences (DrInC)

1. I have driven a motor vehicle after having three or more drinks.
2. I have ridden in a motor vehicle with a driver who had three or more drinks.
3. I have been arrested for driving under the influence of alcohol.
4. I have had trouble with the law (other than driving while intoxicated) because of my drinking.
5. I have taken foolish risks when I have been drinking.
6. When drinking, I have done impulsive things that I regretted later.
7. While drinking or intoxicated, I have been physically hurt, injured, or burned.
8. While drinking or intoxicated, I have injured someone else.

APPENDIX F: IRB APPROVAL DOCUMENTS



February 16, 2006

Jacqueline Alphonso
University of Central Florida
Department of Psychology
PH 302
Orlando, FL 32816-1390

Dear Ms. Alphonso:

With reference to your protocol #06-3216 entitled, "**Alcohol Screening and Intervention with Mandated Students: A Program Evaluation,**" I am enclosing for your records the approved, expedited document of the UCF IRB Form you had submitted to our office. **This study was approved on 2/13/06. The expiration date will be 2/12/07.** Should there be a need to extend this study, a Continuing Review form must be submitted to the IRB Office for review by the Chairman or full IRB at least one month prior to the expiration date. This is the responsibility of the investigator. **Please notify the IRB office when you have completed this research study.**

Please be advised that this approval is given for one year. Should there be any addendums or administrative changes to the already approved protocol, they must also be submitted to the Board through use of the Addendum/Modification Request form. Changes should not be initiated until written IRB approval is received. Adverse events and unanticipated problems should be reported to the IRB as they occur.

Should you have any questions, please do not hesitate to call me at 407-823-2901.

Please accept our best wishes for the success of your endeavors.

Cordially,

Barbara Ward

Barbara Ward, CIM
UCF IRB Coordinator
(FWA00000351 Exp. 5/13/07, IRB00001138)

Copies: IRB File
Michael Dunn, Ph.D.
Tom Hall, MSW, LCSW

BW:jm



Office of Research & Commercialization

January 18, 2007

Jacqueline Alfonso
University of Central
Department of Psychology
PH 302
Orlando, FL 32816-1390

Dear Ms. Alfonso:

With reference to your protocol #07-4119 entitled, "Alcohol Screening and Intervention with Mandated Students: A Program Evaluation," I am enclosing for your records the approved, expedited document of the UCFIRB Form you had submitted to our office. **This study was approved on 01/18/2007. The expiration date for this study will be 01/17/2008.** Should there be a need to extend this study, a Continuing Review form must be submitted to the IRB Office for review by the Chairman or full IRB at least one month prior to the expiration date. This is the responsibility of the investigator.

Please be advised that this approval is given for one year. Should there be any addendums or administrative changes to the already approved protocol, they must also be submitted to the Board through use of the Addendum/Modification Request form. Changes should not be initiated until written IRB approval is received. Adverse events should be reported to the IRB as they occur.

Should you have any questions, please do not hesitate to call me at 407-823-2901.

Please accept our best wishes for the success of your endeavors.

Cordially,

A handwritten signature in cursive script that reads 'Joanne Muratori'.

Joanne Muratori
(FWA00000351 Exp. 5/13/07, IRB00001138)

Copies: IRB File
Michael Dunn, Ph.D.
Tom Hall, MSW

JM:jm

REFERENCES

- Agostinelli, G., Brown, J. M., & Miller, W. R. (1996). Effects of normative feedback on consumption among heavy drinking college students. *Journal of Drug Education, 25*(1), 31-40.
- American Psychiatric Association. (1994). *Diagnostic and statistical manual of psychiatric diagnoses (4th ed.)*. Washington, DC: Author.
- Babor, Higgins-Biddle, Saunders, & Monteiro (2001). The Alcohol Use Disorders Identification Test: Guidelines for use in primary care. Retrieved, 2007, from:
http://whqlibdoc.who.int/hq/2001/WHO_MSD_MSB_01.6a.pdf
- 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*(8), 1310-1316.
- Baer, J. S., Marlatt, G. A., & Kivlahan, D. R. (1992). An experimental test of three methods of alcohol risk reduction with young adults. *Journal of Consulting and Clinical Psychology, 60*(6), 974-979.
- Barnett, N. P., Murphy, J. G., Colby, S. M., & Monti, P. M. (2007). Efficacy of counselor vs. computer-delivered intervention with mandated college students. *Addictive Behaviors, Vol 32*(11), 2529-2548.
- Barnett, N. P. & Read, J. P. (2005). Mandatory alcohol intervention for alcohol-abusing college students: A systematic review. *Journal of Substance Abuse Treatment, 29*(2), 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*(6), 966-975.

- Bien, T. H., Miller, W. R., & Tonigan, J. S. (1993). Brief interventions for alcohol problems: A review. *Addiction*, 88(3), 315-335.
- Borsari, B. & Carey, K. B. (2000). Effects of a brief motivational intervention with college student drinkers. *Journal of Consulting and Clinical Psychology*, 68(4), 728-733.
- Borsari, B., & Carey, K. (2005). Two brief alcohol interventions for mandated students. *Psychology of Addictive Behaviors*, 19(3), 296-302.
- Caldwell, P. E. (2002). Drinking levels, related problems and readiness to change in a college sample. *Alcoholism Treatment Quarterly*, 20(2), 1-15.
- Carey, K. B., Scott-Sheldon, L. A. J., Carey, M. P., & DeMartini, K. S. (2007). Individual-level interventions to reduce college student drinking: A meta-analytic review. *Addictive Behaviors*, 32(11), 2469-2494.
- Collins, S. E., Carey, K. B., & Sliwinski, M. J. (2002). Mailed personalized feedback as a brief intervention for at-risk college drinkers. *Journal of Studies on Alcohol*, 63, 559-576.
- Darkes, J. & Goldman, M. S. (1993). Expectancy challenge and drinking reduction: Experimental evidence for a mediational process. *Journal of Consulting and Clinical Psychology*, 61(2), 344-353.
- Darkes, J. & Goldman, M. S. (1998). Expectancy challenge and drinking reduction: Process and structure in the alcohol expectancy network. *Experimental and Clinical Psychopharmacology*, 6(1), 64-76.
- Dimeff, L. A., Baer, J. S., Kivlahan, D. R., & Marlatt, G. A. (1999). *Brief Alcohol Screening and Intervention for College Students (BASICS): A harm reduction approach*. New York: Guilford Press.

- Dishion, T. J. & Dodge, K. A. (2005). Peer contagion in interventions for children and adolescents: Moving towards an understanding of the ecology and dynamics of change. *Journal of Abnormal Child Psychology*, 33(3), 395-400.
- Erdfelder, E., Faul, F., & Buchner, A. (1996) GPOWER: A general power analysis program. *Behavior Research Methods, Instruments & Computers*, 28(1), 1-11.
- Fleming, M. F., Barry, K. L., & MacDonald, R. (1991). The Alcohol Use Disorders Identification Test (AUDIT) in a college sample. *International Journal of the Addictions*, v26(11), 1173-1185.
- Flynn, C. A. & Brown, W. E. (1991). The effects of a mandatory alcohol education program on college student problem drinkers. *Journal of Alcohol and Drug Education*, 37(1), 15-24.
- Forcehimes, A. A., Tonigan, J. S., & Miller, W. R. (2007). Psychometrics of the Drinker Inventory of Consequences (DrInC). *Addictive Behaviors*, 32(8), 1699-1704.
- 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(6), 1038-1049.
- Fromme, K., Marlatt, G. A., Baer, J. S., & Kivlahan, D. R. (1994). The Alcohol Skills Training Program: A group intervention for young adult drinkers. *Journal of Substance Abuse Treatment*, 11(2), 143-154.
- Hingson, R. W., Heeren, T., & Zakocs, R. C. (2002). Magnitude of alcohol-related mortality and morbidity among U.S. college students ages 18-24. *Journal of Studies on Alcohol*, 63(2), 136-144.
- Juarez, P., Walters, S. T., Daugherty, M. & Radi, C. (2006). A randomized trial of motivational interviewing and feedback with heavy drinking college students. *Journal of Drug Education*, 36(3), 233-246.

- Kaplan, R. M., & Frosch, D. L. (2005). Decision making in medicine and health care. *Annual Review of Clinical Psychology, 1*(1), 525-556.
- Kivlahan, D. R., Marlatt, G. A., Fromme, K. (1990). Secondary prevention with college drinkers: Evaluation of an alcohol skills training program. *Journal of Consulting and Clinical Psychology, 58*(6), 805-810.
- Korenman, L. M. & Peynircioglu, Z. F. (2007). Individual differences in learning and remembering music: Auditory versus visual presentation. *Journal of Research in Music Education, 55*(1), 48-64.
- Kypri, K., Gallagher, S. J, & Cashell-Smith, M. L. (2004). An Internet-based survey method for college student drinking research. *Drug and Alcohol Dependence, 76*(1), 45-53.
- Kypri, K., Saunders, J. B., & Gallagher, S. J. (2003). Acceptability of various brief intervention approaches for hazardous drinking among university students. *Alcohol and Alcoholism, 38*(6), 626-628.
- LaBrie, J. W., Tawalbeh, S., & Earleywine, M. (2006). Differentiating adjudicated from nonadjudicated freshmen men: The role of alcohol expectancies, tension, and concern about health. *Journal of College Student Development, 47*(5), 521.
- Larimer, M. E., Cronce, J. M., Lee, C. M., & Kilmer, J. R. (2004). Screening and brief intervention part II--A focus on specific settings [Special issue]. *Alcohol Research and Health, 28*(2), 94-104.
- Larimer, M. E., Lee, C. M., Kilmer, J. R., Fabiano, P., Stark, C. & Geisner, I. et al., (2007). Personalized mailed feedback for college drinking prevention: A randomized clinical trial. *Journal of Consulting and Clinical Psychology 75*(2), 285–293.
- Marlatt, G. A. & Gordon, J. R. (Eds.) (1985). Relapse prevention: Maintenance strategies in the treatment of addictive behaviors. New York: Guilford Press.

- McCabe, S. E., Boyd, C. J., Couper, M. P., & D'Arcy, H. (2002). Mode effects for collecting alcohol and other drug use data: Web and U.S. mail. *Journal of Studies on Alcohol*, *63*(6), 755-761.
- Miller, E. T., Neal, D. J., Roberts, L. J., Baer, J. S., Cressler, S. O., & Metrik, J. (2002). Test-retest reliability of alcohol measures: Is there a difference between internet-based assessment and traditional methods? *Psychology of Addictive Behaviors*, *16*, 56-63.
- Miller, W. R. & Rollnick, S. (2002). *Motivational interviewing: Preparing people to change addictive behavior* (2nd ed.). New York: Guilford Press.
- Miller, W. R., Rollnick, S. & Moyers, T. B. (1998). *Motivational Interviewing: Professional training videotape series* (2 transcripts of 6-part series). Retrieved, 2006, from: <http://casaa.unm.edu/mimanuals.html>.
- Moyers, T. B., Martin, T., Manuel, J. K., Miller, W. R. & Ernst, D. (2007). *Revised global scales: Motivational Interviewing Treatment Integrity (MITI) v. 3.0*. Retrieved, 2007, from <http://casaa.unm.edu/codinginst.html>
- Moyers, T. B., Martin, T., Manuel, J. K., Hendrickson, S. M. L., & Miller, W. R. (2005). Assessing competence in the use of motivational interviewing. *Journal of Substance Abuse Treatment*, *28*(1), 19-26.
- Murphy, J. G., Benson, T. A., Vuchinich, R. E., Deskins, M. M., Eakin, D., 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 of Alcohol*, *65*(2), 200-203.
- Murphy, J. G., Duchnick, J. J., Vuchinich, R. E., Davison, J. W., Karg, R. S., Olson, A. M., Smith, A. F., & Coffey, T. T. (2001). Relative efficacy of a brief motivational

- intervention for college student drinkers [Special issue]. *Psychology of Addictive Behaviors*, 15(4), 373-379.
- National Institute on Alcohol Abuse and Alcoholism. (2002). *A call to action: Changing the culture of drinking in U.S. colleges*. NIH Pub. No. 02-5010. Bethesda, MD: NIAAA.
- Neal, D. J. & Carey, K.B. (2004). Developing discrepancy within self-regulation theory: Use of personalized normative feedback and personal strivings with heavy-drinking college students. *Addictive Behaviors*, 29(2), 281-297.
- 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(3), 434-447.
- O'Hare, T. (1997). Measuring problem drinking in first time offenders: Development and validation of the College Alcohol Problem Scale (CAPS). *Journal of Substance Abuse Treatment*, 14(4), 383-387.
- Parks, G.A. & Woodford, M.S. (2005). CHOICES about alcohol: A brief alcohol abuse prevention and harm reduction program for college students. In G. R. Walz & R. K. Yep (Eds.), *Compelling Perspectives on Counseling*. Alexandria: American Counseling Association
- 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: II. *Addiction*, 88(6), 791-804.
- Sobell, L. C., Brown, J., Leo, G. I., & Sobell, M. B. (1996). The reliability of the Alcohol Timeline Followback when administered by telephone and by computer. *Drug and Alcohol Dependence*, 42(1), 49-54.

- Sobell, L. C., & Sobell, M. B. (1992). Timeline follow-back: A technique for assessing self-report alcohol consumption. In R. Z. Litten, & J. P. Allen (Eds.), *Measuring alcohol consumption: Psychology and biochemical methods*. Totowa NJ: Humana Press.
- Steiner, J., W. Woodall, W. G., & Yeagley, J. A. (2005). *The e-Chug: A randomized, controlled study of a web-based binge drinking intervention with college freshmen*. Poster session presented at the annual convention of the Society for Prevention Research, Washington, D.C.
- Substance Abuse and Mental Health Services Administration. (2006). *Results from the 2005 National Survey on Drug Use and Health: National Findings* (Office of Applied Studies, NSDUH Series H-30, DHHS Publication No. SMA 06-4194). Rockville, MD.
- Turner, C. F., Ku, L., Rogers, S. M., Lindberg, L. D., Pleck, J. H. (1998). Adolescent sexual behavior, drug use, and violence: Increased reporting with computer survey technology. *Science*, 280(5365), 867-873.
- Walters, S. T. (2000). In praise of feedback: An effective intervention for college students who are heavy drinkers. *Journal of American College Health*, 48, 235-238.
- Walters, S. T. & Neighbors, C. (2005). Feedback interventions for college alcohol misuse: What, why, and for whom? *Addictive Behaviors*, 30(6), 1168-1182.
- Walters, S. T., Van Sickle, D., & Moyer, R. (2004). *The electronic Check-Up to Go (e-CHUG)*. Developed at San Diego State University. San Diego, California.
- White, H. R. & Labouvie, E. W. (1989). Towards the assessment of adolescent problem drinking. *Journal of Studies on Alcohol*, 50(1), 30-37.
- White, H. R., Morgan, T. J., Pugh, L. A., Celinska, K., Labouvie, E. W., & Pandina, R. J. (2006). Evaluating two brief substance-use interventions for mandated students. *Journal of Studies on Alcohol*, 67(2), 309-317.