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A RANDOMIZED CONTROLLED TRIAL OF A BEHAVIORAL ECONOMIC
INTERVENTION FOR SUBSTANCE ABUSE IN A DIVERSE COLLEGE SAMPLE

by

Ali M. Yurasek

A Dissertation

Submitted in Partial Fulfillment of the

Requirements for the Degree of

Doctor of Philosophy

Major: Psychology

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Abstract

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Heavy drinking and drug use among college students has become a major public health concern. Approximately 45% of college students engage in heavy episodic drinking and 28% of young adults report concurrent alcohol and illegal drug use. This pattern of substance use increases risk for experiencing a variety of substance-related consequences. Brief motivational interventions (BMIs) have been found to be effective in reducing alcohol consumption among college students, yet they yield relatively small effect sizes ($d = .11-.4$). Only about two thirds of students show a treatment response with 5-29% continuing to drink at risky levels. Hence, there is a need to enhance the efficacy of BMI's for alcohol and drug use. Based on research indicating that low-level of substance-free reinforcement is a risk factor for poor BMI response, a recent pilot study demonstrated that one effective way of enhancing the efficacy of BMI's is the introduction of a supplemental session that directly targets the behavioral economic mechanisms of substance-free reinforcement and delayed reward discounting (Substance Free Activity Session: SFAS). The purpose of the current study was to conduct a randomized controlled trial intended to replicate and extend the aforementioned study by adapting the typical motivational interviewing and substance-free activity sessions to address the risk factors of an ethnically diverse college sample and by focusing on both drug and alcohol misuse. In addition to encouraging engagement in constructive alternatives to substance-use and reducing delayed reward discounting, the sessions addressed variables that might confer unique risk for substance misuse among minority

students, such as racism. Participants were 97 college students (58.8% women; 59.8% white/Caucasian; M age = 20.01, SD = 2.23) who reported at least one heavy drinking episode in the past month. After completing a baseline assessment and an individual alcohol-focused BMI, participants were randomized to either the SFAS session or an education control session. A series of mixed model analyses revealed that participants in the BMI + SFAS group reported less overall substance use and fewer days using marijuana at the 6 month follow-up. These results suggest that traditional alcohol and drug BMI's can be enhanced by the addition of a session that focuses on increasing alternatives to substance use.

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A Randomized Controlled Trial of a Behavioral Economic Intervention for Substance Abuse in a Diverse College Sample

Approximately half of the young adult population in the US currently attends college, and 60.3% of these students are current drinkers, with 40.1% engaging in heavy episodic drinking (defined as 5 or more drinks in one occasion for males and 4 or more for females; SAMSHA, 2012; US Department of Education, 2012). These students are at risk of experiencing a variety of alcohol-related problems, ranging from mild (headache or nausea) to more severe consequences (sexual assault, motor vehicle accidents and death; National Institute on Alcohol Abuse & Alcoholism, 2002). Approximately 1,825 college students die each year as a result of alcohol misuse (Hingson, Zha, & Weitzman, 2009). Heavy drinkers enter college with lower academic aptitude, are less engaged in academics, and finish with lower grades compared to other students (Ham & Hope, 2003). Results from the College Alcohol study, an ongoing survey of over 15,000 students at 140 US colleges, indicate that heavy drinking has a significant impact on college students' social relationships and health (Wechsler & Nelson, 2008).

Rates of illicit drug use similarly peak in adolescence and young adulthood, with college students being a particularly high risk group (NHSDA, 2010). Approximately 32% of students report using marijuana in the past year and around 14% of students report using a drug other than marijuana during this time (CORE, 2010; Johnston, O'Malley, Bachman, & Schulenberg, 2012). Among current users of marijuana, 7.2% of students reported using the drug 3 or more times per week and 4.7% reported using at least 20 days in the past month. The most commonly used drugs after marijuana are non-medical use of prescription drugs and amphetamines (CORE, 2010; Johnston et al.,

2012). Overall, roughly 1 in 5 college students' use drugs each month, and approximately 5% of students report near daily drug use. These patterns of heavy drinking and drug use put students at risk for a number of substance-related consequences (Hingson et al., 2009, NHSDA, 2010). Similar to alcohol consumption, a large number of students begin using drugs within the first two years of college and many of these drug users will experience significant consequences including academic difficulties (skipping class, lower GPA, college attrition), the development of drug use disorders, tolerance, and giving up social, occupational, or recreational activities (Budney, 2007; Hingson & White, 2010).

There is a high rate of simultaneous use of drugs and alcohol, with college students often drinking and using drugs during parties and other social events (Murphy, Barnett, & Colby, 2006; Stinson et al., 2005). Combining alcohol with drugs such as sedatives, anti-depressants, and opioids can result in acute health risks including drowsiness, dizziness, difficulty breathing, memory problems and increased risk for overdose (Julien, 2011). Combined use of alcohol and drugs places students at increased risk for experiencing substance-related consequences (McCabe, Cranford, Morales, & Young, 2006; Rhodes, Peters, Perrino, & Bryant, 2008; Shillington & Clapp, 2001). For example, in an African American sample, Rhodes and colleagues (2008) found that students who combined alcohol and marijuana experienced significantly more substance related problems than students who used alcohol alone. They reported more health-related consequences (hangovers, vomiting), violence-related consequences (arguments, fights), dependence symptoms (unsuccessfully tried to stop drinking), and poor decisions (sexual experience that was later regretted). This is similar to what was found in a

predominantly Caucasian sample of students who combined marijuana and alcohol (Shillington & Clapp, 2001). McCabe and colleagues (2006) investigated prescription medication use with *simultaneous* alcohol consumption (at the same time) and *concurrent* alcohol consumption (within the same time period). Individuals who used simultaneously were more likely to report doing poorly on a test, missing class because of drinking, driving after drinking, vomiting, having a drink in the morning, having unplanned sex, and experiencing more blackouts than individuals who used concurrently. Not surprisingly, these individuals also experienced more drug related problems, such as problems with family, feeling guilty about their drug use, and experiencing blackouts because of drug use.

Substance Use in Ethnic Minority College Students

Although heavy drinking and drug use is common among all college students, epidemiological studies suggest that there are ethnic differences in the drinking and drug use patterns of students (Cranford, McCabe, & Boyd, 2006; O'Malley & Johnson, 2002, Paschall, Bersamin, & Flewelling, 2005; Wechsler & Nelson, 2008; White & Jackson, 2005). European-American college students begin drinking at an earlier age and have the highest rate of heavy drinking compared to other ethnic groups (Cranford et al., 2006; O'Malley & Johnston, 2002; Weschler et al., 2002). However, African Americans tend to increase their alcohol consumption during their twenties (Cooper et al., 2008; Flory et al., 2006). African American college students drink and binge drink less than European American students, irrespective of their attendance at a predominately European American or African American university (Meilman, Crace, Presley, & Lysterla, 1995; Presley, Meilman, & Lysterla, 1994). Similarly, 60% of European American students

reported attending parties where the majority of students were under the influence with 36% reporting being intoxicated themselves, compared to 33% of African American students attending these parties with only 5% reporting intoxication (Globetti, Globetti, & Brown, 1996). Cranford and colleagues (2006) reported similar rates of heavy drinking episodes in European and Hispanic American college students (61%), which was significantly higher than Asian Americans (33.2%) and African American students (26.1%).

There may also be important ethnic difference in alcohol-related consequences. Although not limited to college students, Mulia, Ye, Greenfield, and Zemore (2009) found that African American and Hispanic adult drinkers are more likely to report alcohol dependence symptoms and social consequences compared to Caucasian drinkers. In college students, Perkins (2002) reported that Native American and European American students experience the most severe alcohol related consequences, endorsing numerous problems such as academic impairment, blackouts, unprotected sex, property damage and legal costs. Hispanic students were next in terms of rates of consequences experienced, followed by African American and Asian students. Walker, Treno, Grube, and Light (2003) investigated ethnic differences in rates of drinking and driving and riding in a car with a driver who had consumed alcohol in a young adult population. After controlling for alcohol consumption and driving practices, Hispanic Americans demonstrated greater risk for driving after drinking compared to European Americans. Similarly, Hispanic Americans were more likely to report riding in a car with a driver who had been drinking compared to European Americans.

Similar to alcohol consumption, there are also ethnic differences in drug use prevalence (SAMHSA, 2012). Among full-time college students between the ages of 18-22, the rate of illicit drug use was similar for Caucasians (22.7%) and African Americans (25.6%). However prevalence rates among other ethnicities such as multiracial individuals and American Indian or Alaskan Native appears to be higher (30.9% and 30.5% respectively). Rates among Hispanic or Latino (20.6%) and Asian (13.2%) young adults tend to be slightly lower (SAMHSA, 2012). Although college enrollment does not appear to have an association with Caucasian students and illicit drug use, it is positively associated with use in Hispanic students. Similarly, Hausman (2002) found that students attending a historically African American University were more likely to use marijuana every day, and another study found that a larger percentage of African American women use marijuana compared to European American college women (Madison-Colmore, Ford, Cooke, & Ellis, 2003). Hence, although European American students generally report higher rates of substance use, ethnic minority students are also at risk for illicit drug use during college.

Factors Influencing Substance Abuse in Ethnic Minority Students

The differences in substance abuse patterns observed among ethnic minority students may be explained by various risk factors. For example, college students who experience higher levels of stress are more inclined to increase their alcohol consumption (Colder & Chassin, 1993; McCreary & Sadava, 2000; Perkins, 1999). Ethnic minority students may be more susceptible to increases in alcohol and drug use during the college years than Caucasian students due to difficulty handling elevated academic stress, discrimination and racism, new peer relationships, and the absence of a supportive

familial environment (Hingson et al., 2002). Racial discrimination is a predictor for alcohol use and misuse among college students (Broman, 2007), with racism related to frequency and quantity of alcohol intake, and alcohol-related problems. African American students are more likely to report incidents of racial discrimination, which could in turn contribute to heavy drinking (Broman, 2007).

African American women who reported stronger ethnic identification or endorsement of traditional cultural characteristics reported lower levels of marijuana use (Nasim, Corona, Belgrave, Utsey, & Fallah, 2007), suggesting cultural identification as a potential protective factor against drug use. Although it appears ethnic minority groups use fewer substances than Caucasians, variables such as discrimination, racism, stress and poor coping skills could place some ethnic minorities at risk and warrant further investigation.

Brief Motivational Interventions for Alcohol Use in College Students

In light of the increasingly well-documented knowledge of the social, health, and academic problems associated with drinking and drug use, the prevention and intervention of college student substance abuse has become a public health priority (Caldeira, Arria, O'Grady, Vincent, & Wish, 2008). To date, the most promising approach for reducing risky drinking in college students is brief motivational interventions (BMIs; Cronic & Larimer, 2011). BMIs are typically delivered in one or two sessions and focus on changing problematic behavior by enhancing motivation and commitment. BMIs usually include personalized feedback about the student's drinking, blood alcohol content (BAC), and alcohol-related consequences, as well as advice for moderate use (Dimeff, Baer, Kivlahan, & Marlatt, 1999; Larimer, Cronic, Lee, &

Kilmer, 2004/2005). The feedback and advice are delivered in a supportive and nonjudgmental counseling approach that focuses on increasing motivation to reduce drinking and related problems (Miller & Rollnick, 2013).

Efficacy of BMIs for Alcohol Use in College Students

A meta-analysis of 15 studies investigating the effectiveness of MI for reduced alcohol consumption concluded that MI was an effective treatment for alcohol use across populations, with this effect being strengthened in younger, college-aged adults who were heavy, but low-dependent drinkers (Vasilaki, Hosier, & Cox, 2006). Three of the studies included in the review focused specifically on the effectiveness of BMIs in the college population and found that BMIs were more effective than an assessment-only control group for alcohol consumption reduction (Baer, Kivlahan, Blume, McKnight, & Marlatt, 2001; Marlatt et al., 1998; Murphy et al., 2001). Murphy and colleagues (2001) found that for heavier drinkers, the BMI showed greater reductions in weekly alcohol consumption and binge drinking episodes compared to both assessment-only and education control groups. Other studies have found similar results with decreased alcohol consumption and risk reduction within the college student population (Carey, Carey, Maisto, & Henson, 2006; Carey, Henson, Carey, & Maisto, 2007; Miller & Sanchez, 1994).

In a recent review of 17 BMI studies with college drinkers, Crouse and Larimer (2011) found support for skills based approaches and motivational interventions that included personalized feedback, noting that 13 studies found reductions in alcohol consumption and alcohol-related problems. Two studies (Borsari & Carey, 2005; LaChance, 2004) noted improvements on at least one outcome in the BMI condition

compared to a multi-component skills intervention. Despite the fact that BMIs are consistently associated with significant reductions in drinking relative to control conditions, only about two thirds of students show a treatment response, with 5-29% of students continuing to drink at a risky level (Roberts, Neal, Kivlahan, Baer, & Marlatt, 2000). Additionally, BMIs typically only yield small to moderate effect sizes ($d = .11-.4$; Carey et al., 2007; Larimer & Crounse, 2007). Hence, there is a need to improve BMIs while keeping them relatively brief. Furthermore, very little research has examined substance use interventions among ethnic minority students, despite the fact that they constitute an increasingly large percentage of the US college population (U.S. Department of Education, 2009). Similarly, with the differences in substance use and substance related problems experienced between different ethnicities, it is important to incorporate a diverse sample when testing interventions to see if ethnic differences are factors in response to treatment.

Enhancing BMIs for College Student Drinking

Studies have demonstrated that adding more of the same material to BMIs, such as increased session length and booster sessions does not enhance efficacy (Barnett, Murphy, Colby, & Monti., 2007; Kulesza, Apperson, Larimer, & Copeland, 2010). However, BMIs that are enhanced with additional components may be superior to standard BMIs. For example, motivational interviewing combined with personalized feedback is superior to either component alone (Walters, Vader, Harris, & Craig, 2009). Additionally, alcohol BMIs combined with coping skills training (Hansson et al., 2007) led to long-term intervention gains (12-month and 24-month follow-up) compared to either the alcohol intervention or coping skills intervention alone. Similarly, BMIs

enhanced with parental coaching was found to be effective in reducing college freshmen drinking (Turrisi et al., 2009; Wood, Englander-Golden, & Pillai, 2010). Hence, motivational interviews have consistently demonstrated efficacy in reducing alcohol consumption and alcohol-related problems with recent evidence suggesting additional novel sessions or components appear to enhance traditional BMIs.

Efficacy of BMIs for College Student Drug Use

Although motivational interviews have been shown to be efficacious with reducing alcohol use in college students (Cronce & Larimer, 2011), few studies have examined this approach with drug use outcomes. Using a motivational interviewing framework focusing on reducing alcohol consumption, cigarette smoking and illicit drug use young drug users (16-20 years old), McCambridge and Strang (2004) found a reduction in marijuana use at a 3-month follow-up, but no significant changes in other illicit drug use. Similarly, White and colleagues (2006) found a reduction in marijuana use in college students at a 3-month follow-up using an in person alcohol and drug focused motivational interview with personalized feedback and feedback alone.

Although both studies found a reduction in marijuana use, the McCambridge and Strang study did not use college students, incorporate personalized feedback or compare to an active control group and the effect size reduction in the White et al. study was small ($d = .13$). Lee and colleagues (2013) conducted a randomized controlled trial investigating a brief motivational intervention solely targeting marijuana use. In comparison to an assessment only control group, participants in the intervention group reported significantly fewer joints smoked per week at 3-month follow-up; however, differences were no longer significant at the 6-month follow-up. Finally, using a computer delivered

session, one study found that students with a family history of drug problems and higher motivation to change reduced their drug use at 3-month follow-up (Lee, Neighbors, Kilmer, & Larimer, 2010). These findings suggest face-to-face brief motivational interviews might increase motivation to change drug use and reduce drug use.

Improving BMIs with a Behavioral Economic Supplement

Behavioral economic theory posits that drug use is influenced by constraints on access to drugs and the availability and value of alternative substance-free source of reinforcement (Vuchinich & Tucker, 1988). Generally, the value a person places on a substance is a function of the benefit/cost ratio of using that substance in relation to the benefit/cost ratio of other available activities. In both laboratory and natural settings, research has demonstrated that substance use is responsive to changes in response cost or increases in drug prices (Hursh & Winger, 1995; Murphy & MacKillop, 2006). Other research in this area has found that high rates of substance use typically occurs in contexts where there is an absence of sources of substance-free reinforcers and use decreases in response to an increase in alternative reinforcers (Bickel, Jarmolowicz, MacKillop, Epstein, Carr et al., 2012; Bickel, Johnson, Koffarnus, MacKillop, & Murphy, 2014; Correia, Benson, & Carey, 2005; Heinz, Lilje, Kassel, & de Wit, 2012; Higgins, Heil, & Plebani-Lussier, 2004).

Although substance use will typically decrease as alternative activities increase, young adult heavy drinkers may under-engage in substance-free activities because the benefits of these activities are often delayed. Whereas alcohol consumption offers immediate rewards (e.g., social facilitation, anxiety reduction, euphoria), many substance-free related activities (e.g., attending class, volunteering) are associated with

delayed benefits (e.g., graduation, career success), and are not as enjoyable in the moment (Murphy et al., 2006). Although the value of all rewards decreases as the delay of their receipt increases, there are individual differences in the degree to which delayed rewards are “discounted” or devalued. This phenomenon, known as delayed reward discounting, may be a central feature of substance abuse (Madden & Bickel, 2010; Vuchinich & Simpson, 1998). In fact, a recent meta-analysis indicated greater delayed reward discounting in individuals displaying addictive behaviors, especially in those with an addictive disorder (MacKillop et al., 2011). Delay discounting is typically measured using a behavioral task in which participants choose between a series of immediate and delayed rewards. It can be assessed via questionnaires (Kirby & Petry, 2004; Kirby, Petry, & Bickel, 1999), computerized tasks involving hypothetical rewards (Baker, Johnson, & Bickel, 2003; Johnson & Bickel, 2002), and experiential tasks utilizing real monetary rewards (Reynolds & Fields, 2012). Behavioral economic research suggests that increasing the salience of these delayed rewards (longer, later rewards) can reduce impulsive response patterns (smaller, sooner rewards) and potentially decrease substance use, by suggesting or requiring substance abusers to think of their decisions or behaviors (smoke, drink) as a series of “bundles” or patterns (Hofmeyr, Ainslie, Charlton, & Ross, 2011). For example, manipulating students’ perception of how salient a current choice or behavior is to similar, but more delayed choices/behaviors. Hence, BMIs that incorporate a discussion of behaviors as a series of aggregated choice patterns may help substance abusers make more future oriented choices illustrated by a decrease in risky drinking and drug use behaviors (Bickel et al., 2014).

In addition to delayed discounting, the incentive value of alcohol may be another target for intervention. The proportion of resource allocation and enjoyment associated with substances compared to substance-free reinforcers has been used to quantify the availability and reinforcing efficacy of substances relative to other reinforcers in the individual's environment, and might reflect an index of alcohol problem severity (Correia & Carey, 1999; Tucker, Vuchinich, & Rippins, 2002; Vuchinich & Tucker, 1996). Murphy et al. (2005) examined the behavioral economic hypothesis that substance use is partially a function of the value placed on substances in relation to other available reinforcers by predicting drinking outcomes following an alcohol BMI. They found that heavy drinking females who at baseline derived less reinforcement from substance use relative to substance-free activities reported less alcohol consumption 6 months following a BMI. Both males and females who reduced their drinking at follow-up showed an increase in reinforcement from substance-free activities. Hence, individuals with few rewarding alternatives to drinking are less likely to respond to traditional BMIs, however, those who reduce their drinking following a BMI are likely to increase their engagement in substance free activities.

Based on the above findings, a recent study by Murphy, Dennhardt, Skidmore, Borsari, Barnett et al. (2012a) combined a 50-60 minute standard alcohol BMI and a 50-60 minute behavioral economic Substance-Free Activity Session (SFAS). The SFAS used motivational interviewing and personalized feedback to facilitate drinking reductions by increasing student's participation in academic, community and recreational activities; hence targeting the behavioral economic mechanisms of substance-free reinforcement and delayed reward discounting. Investigators developed this treatment

based on feedback from consultants in college drinking and behavioral economics, six focus groups with heavy drinking college students and an open pilot trial ($N = 14$; Murphy et al., 2012b) that demonstrated reductions in drinking.

Participants in the Murphy study (2012a) were 82 heavy drinking college students (two or more heavy drinking episodes). In comparison to an alcohol BMI plus a relaxation training active control session, the alcohol BMI + SFAS condition was associated with significantly greater reductions in alcohol related problems at both 1-month and 6-month follow-up assessments. The BMI + SFAS showed large effect size reductions in alcohol problems at 1-month ($d_w = .98$) and largely maintained that reduction at the 6-month follow-up ($d_w = .71$), whereas the BMI + Relaxation condition showed no change in problems at 1-month and a small effect size change at 6-months ($d_w = .26$).

This effect was partially mediated by an increase in protective behavioral strategies, such as using a designated driver, avoiding drinking games and leaving bar/party at a predetermined time. Additionally, students in the BMI plus SFAS condition who reported lower levels of substance-free reinforcement or symptoms of depression at baseline reported greater reductions in heavy drinking. These findings suggest that incorporating a single session focused on increasing engagement in alternative activities can enhance the effects of standard BMIs. The supplemental session included in the current study attempted to increase positive academic, leisure, and community activities that might substitute for alcohol and drug use.

The current study intended to replicate and extend the Murphy et al. (2012a) study by adapting the typical motivational interviewing and substance-free activity sessions to

address the risk factors of an ethnically diverse college sample. Additionally, this study focuses on both drug *and* alcohol misuse. Because the requirement for two one-hour sessions in the original BMI + SFAS protocol (Murphy et al., 2012a) might be a barrier to dissemination at many colleges and universities, the current study also extended the Murphy et al. (2012a) study by evaluating an abbreviated version of the BMI + SFAS intervention that was only one hour combined (30 minutes for BMI and 30 minutes for SFAS) rather than two hours. In addition to encouraging engagement in constructive alternatives to substance-use and reducing delayed reward discounting, the sessions addressed variables that might confer unique risk for substance misuse among minority students, such as racism.

Dissertation Study

The goal of this study was to extend the research on brief motivational interviews for college students by addressing several key limitations to the existing literature. With the exception of Ingersoll and colleagues (2005) who conducted a randomized controlled trial investigating alcohol-exposed pregnancy in a sample of college females that was 17% African American, and Murphy, Dennhardt, Skidmore, Martens, & McDevitt-Murphy (2010) who conducted two similar randomized controlled trials examining BMI with computerized programs in a sample of college students with 23% being African American, the majority of studies have included very small numbers of minority students. In light of the ethnic group differences in alcohol and drug use and related consequences, more research is needed to determine whether BMIs are effective for ethnic minority students. For example, the Murphy et al. (2010) study found that African American college students responded better to in-person brief motivational discussions compared to

computer delivered interventions (Murphy et al., 2010). The current study intended to address this gap by including an ethnically diverse college student sample. Additionally, this study attempted to enhance the efficacy of standard BMIs by including a supplemental session that included behavioral economic intervention elements. Finally, the intervention addressed drug use components and evaluated drug use outcomes.

The purpose of this study was to determine if an alcohol BMI with the addition of the novel content described above (session focused on behavioral economic and mood-related variables) will improve upon standard motivational sessions for drug and alcohol use compared to an alcohol BMI combined with an engaged control condition. For this study the control group was a drug and alcohol education session. Although credible, educational components have not been found to be efficacious in reducing alcohol and drug use (Hingson et al. 1997; Wells-Parker, 1995) yet will control for therapist time and contact. This ensured that any differences found between the two groups were because of intervention components. The purpose and corresponding hypotheses for this dissertation are as follows:

1. To examine whether heavy drinking college students who received a behavioral economic supplemental session significantly reduced the number of standard drinks per week, heavy drinking episodes, and alcohol-related consequences compared to a control group at 1-month and 6-months post-intervention.

H1: Participants who received the behavioral economic supplemental session will significantly decrease their drinking and alcohol-related problems compared to control participants.

2. To examine whether heavy drinking college students who also reported drug use and received the additional behavioral economic supplemental session have significantly reduced the number of days in the past month using drugs, reduced the number of days using drugs and alcohol simultaneously, and reduced their drug-related consequences compared to a control group at 6 months post-intervention.

H2: Participants who reported drug use and received the behavioral economic supplemental session will significantly reduce their drug use and drug-related problems compared to control participants.

3. To evaluate potential interactions between ethnicity and treatment outcomes.

H3: Ethnic minority students who received the SFAS session will significantly reduce their alcohol and drug use compared to control participants.

Method

Participants

Participants were 97 undergraduate students (58.8% women; 41.2% men) from a large public university in the southern United States. Students were eligible to participate if they were at least 18 years old and reported one or more heavy drinking episodes (5/4 drinks on one occasion for a man/woman) in the past month. The sample was ethnically diverse; 59.8% identified as European American, 30.9% as African American, 5.2% as Mixed Race, 2.1% as Hispanic/Latino, 1% as Asian, and 1% as Hawaiian/Pacific Islander. The mean age was 20.01 ($SD = 2.23$), with the majority of the students being freshmen (54.2%; $n = 52$). Baseline sample characteristics are presented in Table 3.

Procedure

Recruitment. Approximately 500 undergraduate students were recruited from the University of Memphis psychology subject pool ($N = 73$), other undergraduate courses ($N = 10$), and on-campus organizations ($N = 14$). To ensure the inclusion of a diverse sample, representatives of minority student organizations, such as African Student Association, Empowered Men of Color, and Black Student Association, were contacted to see if they would be willing to ask members to complete a brief (3-5 minute) confidential screening survey that would determine their eligibility (see Appendix B). The researchers attended the group meetings of the amenable organizations to explain the purpose of the study and disperse the screening questionnaire. Students recruited from undergraduate courses were given extra-course credit in exchange for completing the screening survey and students recruited from organizations received a small food incentive (e.g., granola bar).

If the participant met eligibility criteria, the researcher contacted the participant by phone or email (Appendix C), explained the project procedures and confidentiality (Appendix A), and invited the participant to participate in further phases of the study. See Figure 1 to see an illustration of the recruitment, intervention and follow-up assessment. During the baseline assessment, the researcher explained project procedures, potential risks and benefits of participation and aspects of confidentiality. All study participants provided informed consent if they chose to proceed with participation. In order to maintain confidentiality eligible students who consented to participate were assigned an identification number (Appendix D).

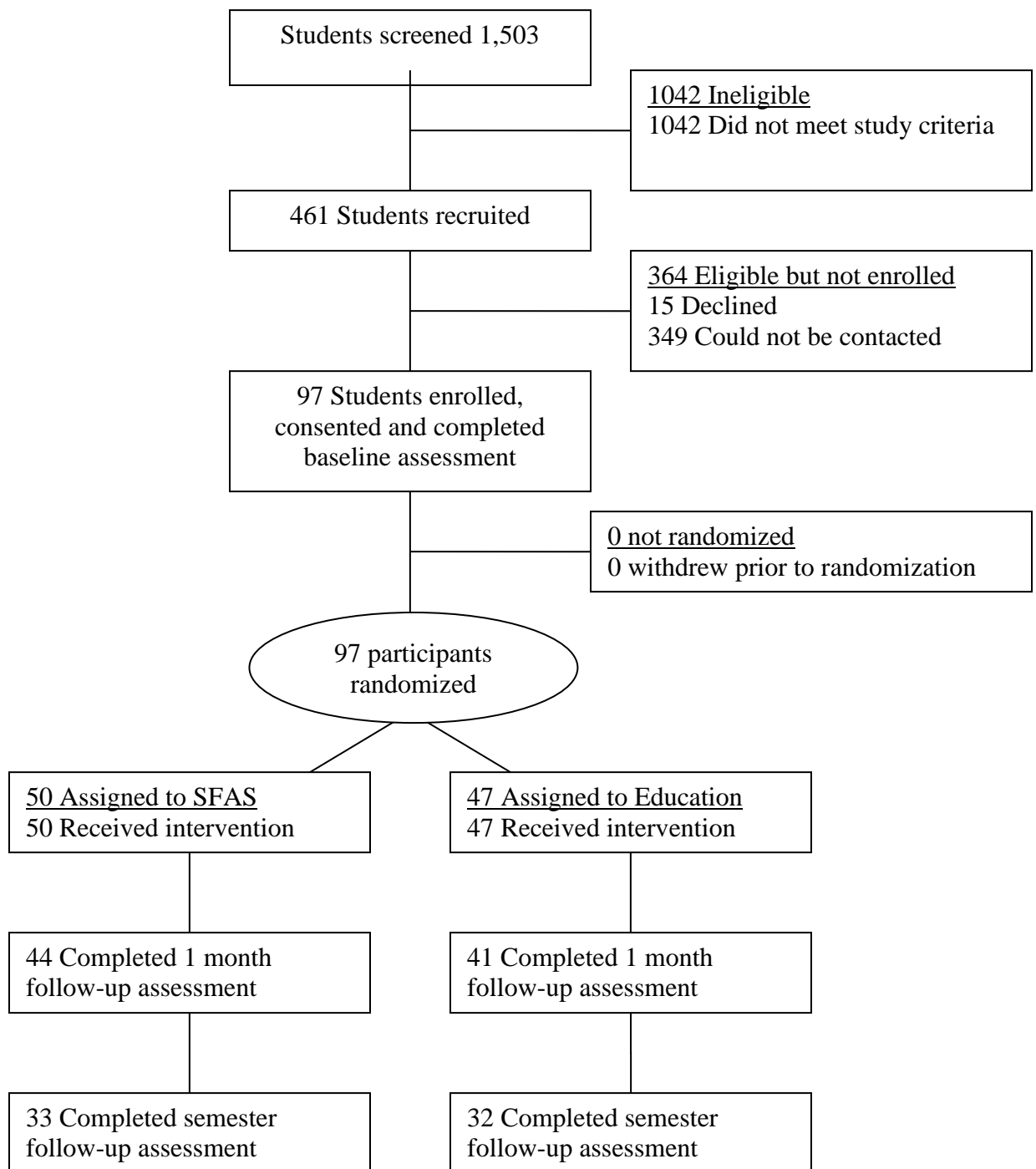


Figure 1. Flow of participants through each stage of study

Participants who met eligibility criteria and were recruited to participate in the clinical trial completed a baseline assessment session in our laboratory. The assessment session began with the informed consent procedure. During the informed consent process, a member of the research team explained to participants the nature of the sessions and the follow-up assessments. Confidentiality and its limits were explained. Following consent, the research assistant administered all assessment measures. After completing the baseline measures, all participants completed an alcohol and drug-focused brief motivational interview. Participants were then randomized to an education session (which provided further information about drugs and alcohol) or the SFAS session designed to increase engagement in substance free activities. An education session was chosen because it is a credible intervention, but not shown to be effective in reducing drinking or drug use (Hingson et al. 1997; Wells-Parker, 1995) and was designed to act as an inert control for nonspecific factors (e.g., contact time and therapist attention). Because several studies have found differential BMI response as a function of gender (Carey et al., 2007) and because we wanted to ensure representativeness of different ethnicities across conditions, we used a random number generator and stratified by gender and ethnicity. To ensure uniform delivery of the alcohol and drug focused BMI across conditions, clinicians were unaware of the condition assignment until after the completion of the first session. These sessions occurred immediately after the baseline assessment session. Follow-up assessments occurred at 1-month following the interventions to assess relatively short-term changes in the outcome variables, and again at 6-months to evaluate any long-term changes. These assessment time points are commonly used in the alcohol intervention literature (Borsari & Carey, 2005; Cimini et

al., 2009; Schaus, Sole, McCoy, Mullett, & O'Brien, 2009). Follow-up assessments took place in the lab. For participants who were unable to attend the follow-up sessions, data was collected via a web survey from the secure site www.qualtrics.com. Studies examining web-based surveys versus paper and pencil surveys have demonstrated no differences in responses suggesting the legitimacy of merging both modes of data collection (De Beuckelaer & Lievens, 2009). In the current study, there were no significant differences in responses on the main outcome variables for participants who took the questionnaires online and those who completed a paper and pencil version at 1 month (online: N = 29; paper: N = 56) or at 6 month (online: N = 6; paper: N = 56).

Measures

Participants completed a battery of measures at baseline, one, and six months post-intervention. Baseline measures assessed demographic information (i.e., age, gender, ethnicity, year in school, socioeconomic status, and residency information; see Appendix E), self-reported alcohol and drug use, alcohol and drug related problems, and attitudes regarding alcohol and drug use. Additionally, mood and racism were assessed for discussion in the SFAS session. The validity of self-report data on alcohol consumption has been investigated in natural settings revealing young adults to accurately report their recent consumption levels, especially when consuming less than 8 drinks (Northcote & Livingston, 2011). Similarly, a meta-analysis revealed self-report data on drug use and alcohol consumption are strongly associated with screening tests (Large et al., 2012) and another meta-analysis revealed consistency between self-report and collateral reports of alcohol consumption in college students (Borsari & Muellerleile, 2009).

Alcohol Consumption. The Daily Drinking Questionnaire (DDQ) was used to assess the total number of standard drinks a student consumes on each day during a typical week in the past month (Collins, Parks, & Marlatt, 1985). Specifically, participants were asked to report on how many standard drinks they consume during each day of a typical week, and over how many hours those drinks were consumed. This measure has demonstrated good internal consistency reliability and is highly correlated with self-monitored drinking reports (Kivlahan et al., 1990) and test retest reliability in college samples ($r = .93$; Miller et al., 1998). In addition, participants were asked to report on their number of heavy drinking episodes in the past month.

Drug Use. Drug use was assessed by asking participants whether or not they used marijuana, cocaine, designer drugs, hallucinogens, heroin and /or methamphetamine in the past month (Murphy, Correia, Colby, & Vuchinich, 2005). If students answered “yes” to drug use, they were asked to report the number of days they used the drug in the past month, the amount of the drug used, and whether they used the drug while consuming alcohol. In addition, participants were asked whether they used prescription drugs (sleeping medications, sedative/anxiety medications, stimulant medications, and/or pain medications) in the past month. If students answered “yes” to prescription drug use, they were asked to report the number of days used in the past month, amount of medication used, and whether they used while consuming alcohol. In addition to number of days using individual drugs, a combined number of days using any drug variable was created. Hence, all days in which a participant reported using any drug was summed and used for analyses.

Alcohol Problems. The Young Adult Alcohol Consequences Questionnaire (YAACQ) is a 48-item scale that has excellent distributional properties and has been shown to

accurately map the continuum of alcohol problem severity among college students (Read, Merrill, Kahler, & Strong, 2007). Participants indicated (yes/no) which items on a list of 49 potential problems they have experienced as a result of their drinking in the past month. The students were asked to indicate whether or not they experienced any of the 49 consequences as a result of their drinking. Examples of items are as follows: “While drinking I have said or done embarrassing things.” “I have felt very sick to my stomach or have thrown up after drinking.” “I have gotten into trouble at work or school because of drinking.” The YAACQ provides an overall summed total score, with higher scores indicative of more alcohol related problems, and eight subscale scores: social–interpersonal, impaired control, self-perception, self-care, risk behaviors, academic/occupational, physical dependence, and blackout drinking. The YAACQ has demonstrated good reliability and validity with college students (Read et al., 2007) and was used for analyses of intervention effects on alcohol-related problems as well as in the context of the BMI to promote self-awareness about the specific costs associated with alcohol consumption. Internal consistency for the YAACQ in this study was .91.

Drug Consequences. Drug-related consequences were assessed by asking participants to indicate the severity of various problems often experienced due to drug use. The measure consists of 19 items inquiring about consequences experienced due to marijuana or other drug use (i.e., problems between you and your partner, to lose your job, to miss days at work or miss classes). Participants are then asked to list what drug(s) caused most or all of these problems. Response items ranged from 0 (*no problem*) to 2 (*serious problem*). Answers on this item were used to provide personalized feedback during the BMI session on consequences experienced due to drug use, as well as in a secondary analysis to investigate

intervention effects on drug-related problems. Internal consistency for the drug use consequences measure was .86.

Negative Affect. The Depression, Anxiety, and Stress Scales (DASS) is a set of three self-report scales designed to measure the negative emotional states of depression, anxiety and stress (Lovibond & Lovibond, 1995). Each of the three DASS scales contains 7 items. Subjects were asked to use 4-point severity/frequency scales to rate the extent to which they have experienced each state over the past week. Scores for Depression, Anxiety and Stress are calculated by summing the scores for the relevant items. Students were given feedback on each item they endorsed with regard to their mood. In this study, internal consistency for the DASS was .93.

Other academic and student engagement measures. Participants reported any school or community activities that they have been involved with in the past or would like to participate in during college (Kuh, 2001). In addition, they were asked to report on the number of hours they spent engaging in several activity categories during a typical week in the past month: studying, attending class, exercising, drinking/drug use, and extracurricular activities. This was used to generate feedback on time allocation for the SFAS as well as to prepare a personalized list of available activities that were consistent with the student's interests. This measure has been used for similar purposes in a previous trial (Murphy et al., 2012a).

Experiences of Racism. The Racism and Life Experiences Scale-Brief version (RaLES-B) was used to measure the level of racism that individuals have experienced and the impact it has had on their life (Harrell, 1997). The RaLES-B assessed the impact of racism on psychological status and health outcomes on ethnic minority populations. This is a

9 item measure in which participants were asked to indicate, using a 4-point Likert scale (0 = *not at all* to 4 = *extremely*), the extent to which the statement reflects their experience.

Scores range from 0 to 36, with higher numbers indicating more experiences of racism and more stress and psychological distress associated with their experience (Harrell, 1997). The RaLES-B has been found to be a reliable and valid measure of the behavioral, psychological and health related outcomes related to perceptions of racism and has been found to be highly correlated with other measures of racism (Utsey, 1998). Responses from this measure were used to provide personalized feedback to ethnic minority students during the SFAS session. Internal consistency for the RaLES-B was .61.

Interventions. Motivational interviewing sessions were conducted by five graduate students in psychology who had completed extensive training and supervision in motivational interviewing and in all three intervention protocols. Treatment manuals were developed for all three interventions to assist with internal validity and treatment integrity. Training included readings, training DVD's, small group training, individual feedback, and completing at least one complete session role-play for each condition. Due to the inclusion of a diverse sample and the cultural relevance of the sessions, interventionists were also trained in cultural awareness. Clinicians were provided with readings and cases were discussed during supervision. All sessions were audio-taped and weekly group supervision was provided by the faculty advisor who is a licensed clinical psychologist with extensive experience training and supervising brief motivational interventions for substance misuse. In addition, integrity coding was conducted to ensure consistency with protocol in terms of content and motivational interviewing style.

Alcohol and Drug-Focused Brief Motivational Intervention. Following the baseline assessment, participants completed a culturally relevant BMI. Although the original study (Murphy et al., 2012a) conducted 50-minute alcohol sessions, this study limited all sessions to 25-30 minutes. See Table 1 for segments included and/or eliminated from the Murphy et al. (2012a) study. Prior research has indicated that providing longer BMI sessions (e.g., 10 vs. 50 min; Kulesza et al., 2010) or booster sessions (Barnett et al., 2007) does not appear to improve outcomes. In addition, the current study wanted to provide two interventions in 60 minutes, which tested whether an intervention approach that reduces therapist and participant time burden is effective. This 25-30 minute intervention included information intended to encourage students to reduce their use of alcohol and other drugs and was explicitly developed for college students with mild to moderate levels of alcohol and or drug use problems. This intervention session has been used before in other research studies and has been well-received by students (Murphy et al., 2001).

The goals of this session were to raise concern about drinking and its negative consequences for the student, understand the student's feelings about drug use, including pros and cons, provide feedback to student via personal information from the assessment and general information about drinking and its effects (both short-term and long-term), assist student in strategizing means for avoiding future alcohol-related problems, provide guidance to student in setting goals for reducing drinking and alcohol-related problems, elicit self-motivational statements, and increase self-efficacy for change (Miller & Rollnick, 2013).

The session began by encouraging the student to talk about their use of alcohol and drugs, how their patterns of use has changed over time, and to engage the student in a

decisional balance exercise, in which they discussed what they like and dislike about alcohol. Students then received personalized feedback on how their drinking and drug use compares to that of other students of their ethnicity and gender, and consequences of their risky alcohol and drug use (Appendix F). Previous work on providing personalized normative feedback is mixed. Perceived norms have been found to vary depending on the race/ethnicity of the reference group (Larimer et al., 2011) and perceived norms for same-ethnicity students are positively related to alcohol consumption (Neighbors, LaBrie et al., 2010). Additionally, generic norms were found to be predictive of Caucasian student drinking, but not for Asian students. However, LaBrie and colleagues (2013) found that providing specific gender and ethnic norms was not indicative of reduced drinking following an intervention. This study only included Caucasian and Asian students; further research is warranted to investigate the impact of gender and race specific feedback regarding both alcohol and drug use as well. This section attempted to provide the student with a non-judgmental assessment of their personal alcohol use, including relevant risks. The interventionist discussed the feedback with the student and, consistent with the student's level of motivation, provided advice on reducing or eliminating alcohol and drug use. The session concluded with a summary of the discussion and feedback. If the student indicated a desire to change their drinking, the clinician assisted the student in establishing goals and developing a plan. In addition, various harm reduction strategies were discussed with the student.

Table 1

Comparison of Segments Included in the Alcohol and Drug BMI between the Murphy et al. (2012a) Study and the Current Study¹

	Murphy et al (2012)	Current Study
BMI		
Decisional Balance	X	X
Feedback	X	X
Alcohol Normative Data		
Gender Specific	X	X
Ethnic Specific		X
National data	X	
U of M		X
BAC	X	X
Alcohol Related Risks		
Binge Drinking	X	X
Specific Consequences	X	X
Risky Sex	X	
Alcohol Dependence	X	
Important Info for Women	X	X
Drug Use		
Marijuana Normative Feedback	X	X
Other Illicit Drug Normative Feedback		X
Drug Related Consequences (generally)	X	

Table 1 (Continued)

	Murphy et al (2012)	Current Study
BMI		
Drug Related Consequences (specific)		X
Risks Associated with Drug Use	X	X
Simultaneous Alcohol and Drug Use		X
DUI	X	X
Money Spent	X	
Calories	X	
Goal Setting	X	X
Strategies	X	X
Summary	X	X

¹ *Note.* All modules included in the current study were briefer in comparison to the Murphy et al. (2012a) study

Substance Free Activity Session (SFAS). This 25-30 minute session directly targeted the behavioral economic mechanisms of substance-free reinforcement and delayed reward discounting by encouraging the development of and commitment to academic and career goals, and by highlighting the impact of day-to-day patterns of heavy drinking and academic engagement on these goals. See Table 2 for a comparison of segments included and eliminated between the current study and the Murphy et al. (2012a) study. The goal was to enhance the efficacy of traditional BMIs by increasing the salience of academic and career goals, highlighting the relations between substance use and both college and life goals (specifically developing discrepancy between heavy drinking and the student's ability to acquire the grades and experiences necessary to accomplish his/her goals), encouraging the

student to alter his/her general lifestyle such that there is a greater density of substance-free reinforcement, less unstructured leisure time, and greater engagement in positive aspects of college life. The intervention consisted of several sections, paralleling information contained on a personalized feedback form in the alcohol BMI session. The intervention was personalized, based on the ethnicity and assessment information provided by each student. Similarly the feedback was tailored to the student's interest and career goals. To ensure all elements were addressed in the allotted amount of time, attention and detail to each area was often brief and dependent on the level of interest and relevance to each student.

The students were encouraged to discuss their college, career, and personal goals. This initial segment featured open-ended questions designed to facilitate discussion. Students were asked about why they decided to attend college, and about their intended major and career goals. After a discussion of the relations between alcohol use and these goals, the student received information on the financial benefits of graduating college and earning good grades, feedback on the requirements for his/her intended career (e.g., minimum GPA, internships, etc.), and discussed their plans for accomplishing these goals. If they were unsure or desired additional information about issues such as requirements for completing their chosen degree, clinicians provided them with this information.

Students were also provided with personalized information regarding the activities that he/she could engage in to further his/her career goals (Appendix G). For minority students, we provided information on ethnic specific organizations such as Black Scholars and the Minority Association for Premedical Students. Additionally, the student was given a personalized time allocation feedback, which specified how much time the student spends each week in a variety of activities. The student's participation in substance-free activities

were also discussed, along with alternate substance-free activities that are available on campus and in the surrounding community. Moreover, students who reported depressive symptoms were provided information on coping skills for enhancing mood and dealing with stress.

Similarly, ethnic minority students who reported experiencing racism on the RaLES-B were asked how (if at all) their experiences with discrimination or racism contributed to their stress and/or related to their drinking/drug use. They were provided feedback and information on adequately coping with discrimination and sources available to them on campus and in the community. For example, students were provided with the appropriate procedures for reporting acts of racism or discrimination experienced on campus, ways to raise awareness on campus and in the community, how to seek support and advice, as well as a link to available support groups in the community, and tips for reducing negative affect associated with racism and discrimination, and the contact information for the student counseling center. Although this element of the SFAS session differed for Caucasian students, motivational interviewing is intended to be flexible in which all sessions are tailored to the unique needs, preferences, and risk factors of individual students (Miller & Rollnick, 2013). Finally, the student and the interventionist formulated goals to help the student re-allocate his or her time and optimize progress towards academic and career related goals, as well as more personal life goals (e.g, weight loss or running a 5k).

Table 2

Comparison of Segments Included in the SFAS Sessions between the Murphy et al. (2012a) Study and the Current Study

	Murphy et al (2012)	Current Study
SFAS		
College/Career Goal Discussion	X	X
Relationship between alcohol/drug use and college/career goals	X	X
Feedback		
Discussion of Graduation Rates	X	X
Benefits of Doing Well in College	X	X
Career Requirements	X	X
Personalized Career Related Activities	X	X
Time Allocation	X	X
Time Spent in Relation to GPA	X	X
Coping with Stress		
Anxiety	X	X
Depression	X	X
Discrimination		X
Substance Free Recreational Activities	X	X
Summary and Goal Setting	X	X

Note. All modules included in the current study were briefer in comparison to the Murphy et al. (2012a) study

Education Component. Students randomized to the 25-30 minute education component were given additional information about alcohol and drugs. This session was conducted by the same clinician who led the previous BMI session. The topics discussed during

the session were not explicitly linked to personal use, and any questions the students had were answered factually. Personal goals to reduce alcohol were not developed. Specifically, the counselor provided detailed information to the student about how alcohol and other drugs affect the brain and nervous system, memory, sexual performance, and other areas of the body.

The information provided during this session is similar to traditional alcohol education programs commonly found on college campuses, which provide information about the risks of alcohol and drug use via individual sessions, lectures and multisession groups (Monti, Tevyaw, & Borsari, 2005). However, these approaches have not resulted in substance use reductions in either nonstudent or student populations so is an appropriate control for therapist time (Hingson et al. 1997; Wells-Parker et al. 1995). First, the session provided students with information in regard to how alcohol enters the body and how it affects the body and brain. A 5-minute interactive computerized component (Alcohol-101) discussed alcohol's effects on specific brain areas including, the cerebellum, limbic system, frontal and temporal lobes, medulla and brain stem. After the computerized component, clinicians discussed how alcohol affects the heart, lungs, kidneys, liver, reproduction system and stomach and intestines. Similarly, common drugs of abuse including marijuana, opioids, stimulants, and depressants, and their effects on the brain and body were discussed.

Evaluation of Internal Validity (treatment integrity)

Approximately 20% of the BMI sessions ($n = 19$), SFAS ($n = 10$), and education sessions ($n = 9$) were randomly selected and reviewed by one of two doctoral level students who were trained in motivational interviewing but were not involved in the project. At least one session by each clinician was reviewed using a brief intervention adherence protocol commonly used in intervention trials (Barnett et al., 2007; Murphy et al., 2010/2012a). Each

component on the protocol was rated as a 0 (*Didn't do it, N/A*), 1 (*Did it poorly or didn't do it but should have*), 2 (*Meets Expectations*), or 3 (*Above Expectations*). A score of 2 or higher indicated that the intervention component was delivered in a way that is consistent with the protocols in terms of content and motivational interviewing style. A rating of 3 indicated an especially skillful handling of a session component (e.g., handling resistance nondefensively, asking open ended questions or reflections that were especially thoughtful and lead to increased discrepancy or problem recognition, and using advance MI skills such as complex reflections). For the 21 main components of the Alcohol MI intervention protocol the average rating was 2.58 ($SD = .25$, $Mdn = 2.57$), with 100% of the components rated as meeting or exceeding expectations. Competence on 10 specific MI skills (developing discrepancy, rolling with resistance, expressing empathy, etc.; Barnett et al., 2007) was also rated using the same scale described above. The average rating across the MI competence items was 2.84 ($SD = .25$, $Mdn = 3.00$), with 100% of these items being rated as a 2 or 3. These ratings indicate that the clinicians in the study consistently administered the intervention components and adhered to an MI style. For the 21 main components of the ACE protocol the average rating was 2.66 ($SD = .22$, $Mdn = 2.67$), with 100% of the components rated as meeting or exceeding expectations. Competence on 10 specific MI skills (developing discrepancy, rolling with resistance, expressing empathy, etc.; Barnett et al., 2007) was also rated using the same scale described above. The average rating across the MI competence items was 2.62 ($SD = .46$, $Mdn = 2.85$), with 90% of these items being rated as a 2 or 3. These ratings indicate that the clinicians in the study consistently administered the intervention components and adhered to an MI style. For the 10 main components of the Education intervention protocol the average rating was 2.79 ($SD = .27$, $Mdn = 3$), with 100%

of the components rates as meeting or exceeding expectations.

Data Analysis Plan

To minimize the impact of outliers values greater than 3.29 SDs above the mean on a given variable were changed to one unit greater than the greatest nonoutlier value (Tabachnick & Fidell, 2001). Additionally, variables that were skewed or kurtotic were transformed using square root and/or log log transformation. A variable was considered skewed or kurtotic if the skewness or kurtosis statistic divided by the standard deviation of the statistic was greater than 2.4. All transformations used in the final analyses resulted in normal distributions.

Baseline descriptive characteristics of the overall sample were conducted, including demographic information (gender, age, ethnicity, class, experiences of racism) as well as the means and standard deviations for the primary outcome variables (drinks per week, binge drinking episodes, alcohol-related problems, number of days using marijuana, drug related problems, and combined substance use). Additionally, t-tests and chi square analyses were performed to determine whether or not the BMI+SFAS group and the control group were significantly different at baseline on any demographic or alcohol and drug related variables (see Table 3). The relations between sample characteristics and the primary outcome variables were also explored using Pearson correlation statistics (see Table 4).

The primary study analyses examined whether or not there was a statistically significant difference between treatment groups on self-reported alcohol and drug use. A series of mixed-model repeated measures analyses were conducted to compare the MI + Education group and the MI + SFAS group on each of the primary outcome variables at 1 month and 6 month follow-ups. Mixed-effect models (also known as hierarchical linear

models or multilevel models; Gueorguieva & Krystal, 2004) provide a flexible framework for repeated measures analyses. Compared to traditional repeated measures analysis of variance (ANOVA), mixed-effect models utilize all available data for each participant to better accommodate for missing data (Gueorguieva & Krystal, 2004). For each model tested, one of the primary outcome variables served as the dependent variable with gender and ethnicity included as covariates.

Results

Baseline Characteristics

Overall, participants reported consuming an average of 13.49 ($SD = 9.60$) drinks in a typical week and experiencing 4.01 binge episodes ($SD = 3.84$) in the past month. Students endorsed a total of 11.32 ($SD = 8.23$) alcohol-related problems over the past month. Students who reported baseline drug use (illicit and prescription medication) in the past month ($n = 67$, 69.1% of the sample) were using on average 14.22 ($SD = 13.60$) days in the past month and reported 4.16 ($SD = 3.89$) problems related to drug use in the past month. Marijuana was the most commonly used drug with 61.9% of participants reporting use at least 1 day in the past month at baseline, followed by stimulant medication with 15% reporting past month use. On average, minority participants reported a mean score of 14.95 ($SD = 5.37$) on the RaLES-B. After examining baseline levels of the outcomes variables were across conditions, there was a significant baseline treatment group difference in typical weekly drinking and binge drinking episodes; students assigned to BMI+SFAS drank significantly more than students assigned to BMI + ED. There were no differences in alcohol problems, number of drug days, or drug-related problems. Table 3 displays means for demographic and the baseline primary

outcome variables for the entire sample and by treatment condition. Twelve participants did not complete the one-month follow-up ($N = 85$, 88% follow-up rate) and 32 participants did not complete the six-month follow-up ($N = 65$, 67% follow-up rate). Follow-up rates did not differ by condition and there were no demographic or baseline drinking differences between completers and non-completers.

Table 3

Baseline Sample Demographics

	Total Sample	SFAS	Education	<i>t</i> -statistic (<i>df</i>)	χ^2
N	97	50	47		
Age - <i>M</i> (SD)	20.10 (2.23)	20.14 (2.32)	20.06 (2.16)	<i>t</i> (95) = 0.17	
Gender – (%)					.487
Male	40 (41.2)	21 (42.0)	19 (40.4)		
Female	57 (58.8)	29 (58.0)	28 (59.6)		
Race/Ethnicity - (%)					2.18
White or Caucasian	58 (59.8)	30 (60.0)	28 (59.6)		
Black or African American	30 (30.9)	15 (30.0)	15 (31.9)		
Other	2 (9.3)	5 (10.0)	4 (8.5)		
Class - (%)					5.75
Freshman	52 (54.2)	28 (57.1)	24 (51.1)		
Sophomore	16 (16.7)	6 (12.2)	10 (21.3)		
Junior	14 (14.6)	5 (10.2)	9 (19.1)		
Senior	12 (12.5)	8 (16.3)	4 (8.5)		

Table 3 (Continued)

	Total Sample	SFAS	Education	<i>t</i> -statistic (<i>df</i>)
Other ¹	2 (2.1)	2 (4.1)	0 (0)	
Drinks Per Week	13.49 (9.60)	15.34 (9.90)	11.53 (8.97)	<i>t</i> (95) = 2.28*
Past month Binge Drinking Episodes	4.01 (3.84)	4.74 (4.17)	3.23 (3.32)	<i>t</i> (95) = 2.32*
Alcohol Related Problems	11.32 (8.23)	11.72 (8.60)	10.89 (7.89)	<i>t</i> (95) = .492
Past month Drug Use Days	14.22 (13.60)	14.00 (13.68)	14.48 (13.72)	<i>t</i> (65) = -.034
Past month Marijuana Use Days	12.22 (10.67)	12.45 (10.74)	11.97 (10.77)	<i>t</i> (58) = .661
Drug Related Problems	4.16 (3.89)	3.10 (3.73)	2.70 (3.85)	<i>t</i> (65) = .410

* $p < .05$. ** $p < .01$.

Note. ¹Participants categorized as “other” were students who were either in between years (i.e., third semester junior) or those who declined to answer.

Correlations between demographic variables and baseline alcohol and drug use variables are shown in Table 4. Consistent with prior research, being male was related to higher levels of drinks per week and alcohol-related problems. Gender was not related to binge drinking, drug use or drug related problems. Minority students were more likely to be female, consume fewer drinks per week, engage in less binge drinking episodes, and use marijuana fewer days a month. Age and year in school were not significantly associated with any alcohol or drug use variables. Higher number of drinks per week was related to all alcohol and drug use variables, except drug related problems, whereas binge drinking was not associated with any drug use variables. Levels of alcohol and drug problems were significantly correlated. All drug related variable were positively correlated with one another.

Table 4

Correlations between Demographic, Drinking and Drug Related Variables

	1	2	3	4	5	6	7	8	9	10
1. Gender	-	-	-	-	-	-	-	-	-	-
2. Ethnicity	-.217*	-	-	-	-	-	-	-	-	-
3. Age	-.048	-.010	-	-	-	-	-	-	-	-
4. Class	-.157	.021	.665**	-	-	-	-	-	-	-
5. Drinks Per Week	.423**	-.432**	.017	-.081	-	-	-	-	-	-
6. Binge Episodes	-.091	-.208*	-.078	-.091	.554**	-	-	-	-	-
7. Alcohol Problems	.341**	-.086	-.107	-.142	.480**	.364**	-	-	-	-
8. Drug Use Days	.152	-.240	.102	-.028	.327**	.174	.043	-	-	-
9. Marijuana Use Days	.112	-.309*	.208	.044	.334**	.124	-.144	.929**	-	-
10. Drug Problems	.112	.030	-.089	-.160	.136	-.016	.306*	.464**	.458**	-

ns ranged from 96-97 for demographic variables; 97 for alcohol variables; 59-67 for drug use variables

* $p \leq .05$. ** $p \leq .01$.

Analysis of Drinking and Drug Use Outcomes

Alcohol Consumption and Problems. A 2 (group) X 3 (time) mixed-model repeated measures analysis was conducted to compare participants who received BMI+SFAS to those who received BMI+EDUC on number of drinks consumed per week, binge drinking episodes and alcohol-related problems. After controlling for gender and ethnicity, analyses showed a significant main effect for time on weekly drinking, [$F(2, 71.56) = 11.83, p = .000$], binge episodes, [$F(2, 69.92) = 19.54, p = .000$], and alcohol related problems, [$F(2, 71.28) = 6.82, p = .002$; see figures 2-4]. Contrary to our hypothesis, analyses did not find a significant treatment condition X time interaction for the alcohol related outcome variables. Despite the lack of significant interactions, the BMI + SFAS demonstrated larger effect size reductions in drinks per week than participants in the BMI + EDUC condition at both 1-month ($d_{ws} = 1.04$ and $.74$, respectively) and the 6-month follow-up ($d_{ws} = .78$ and $.46$, respectively), and in binge drinking episodes at 1-month ($d_{ws} = .71$ and $.47$, respectively), but not at the 6-month follow-up ($d_{ws} = .43$ and $.38$, respectively). Effect size reductions in alcohol-related problems were relatively equal across the BMI + SFAS and BMI + EDUC conditions at the 1-month follow-up ($d_{ws} = .92$ and $.95$, respectively), with the BMI + EDUC condition demonstrating a slight advantage over the BMI + SFAS condition at the 6-month follow up ($d_{ws} = .85$ and $.64$, respectively).

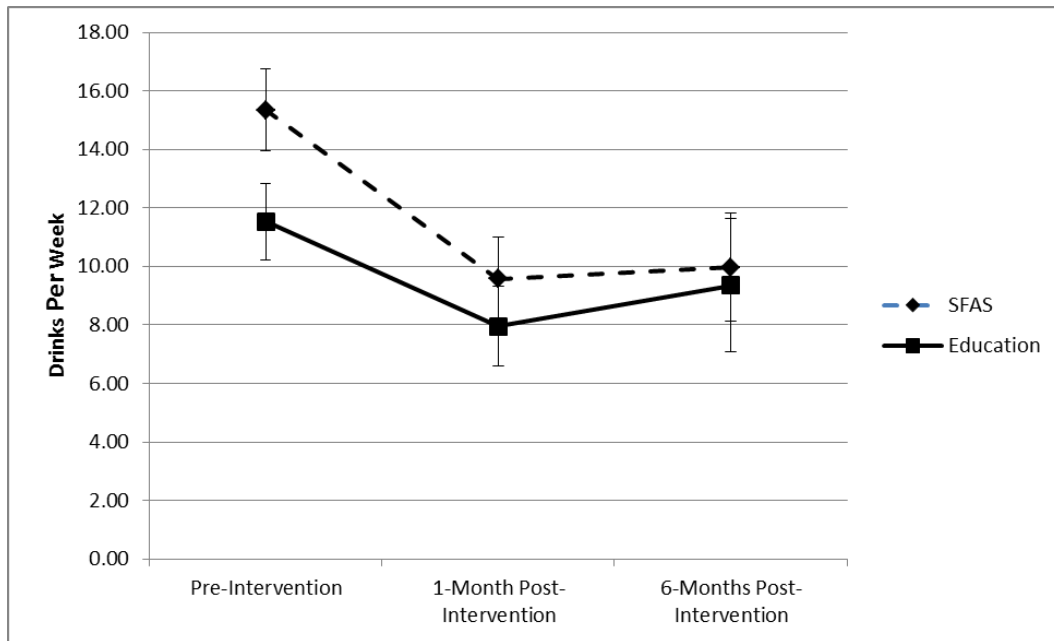


Figure 2. Changes in drinks per week by condition

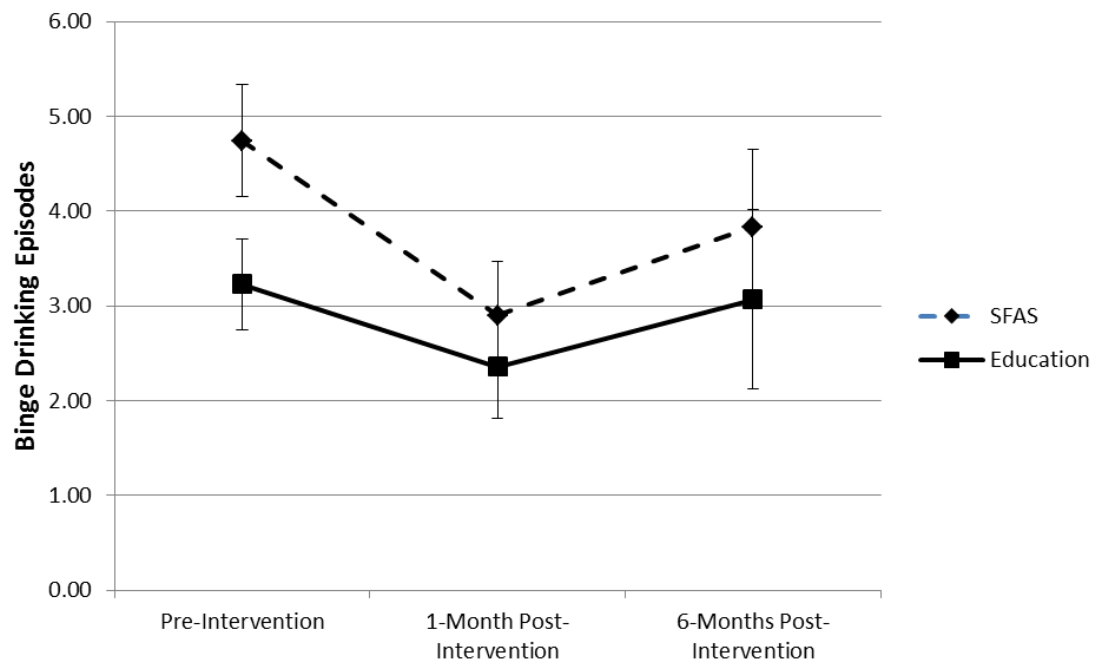


Figure 3. Changes in binge drinking episodes by condition

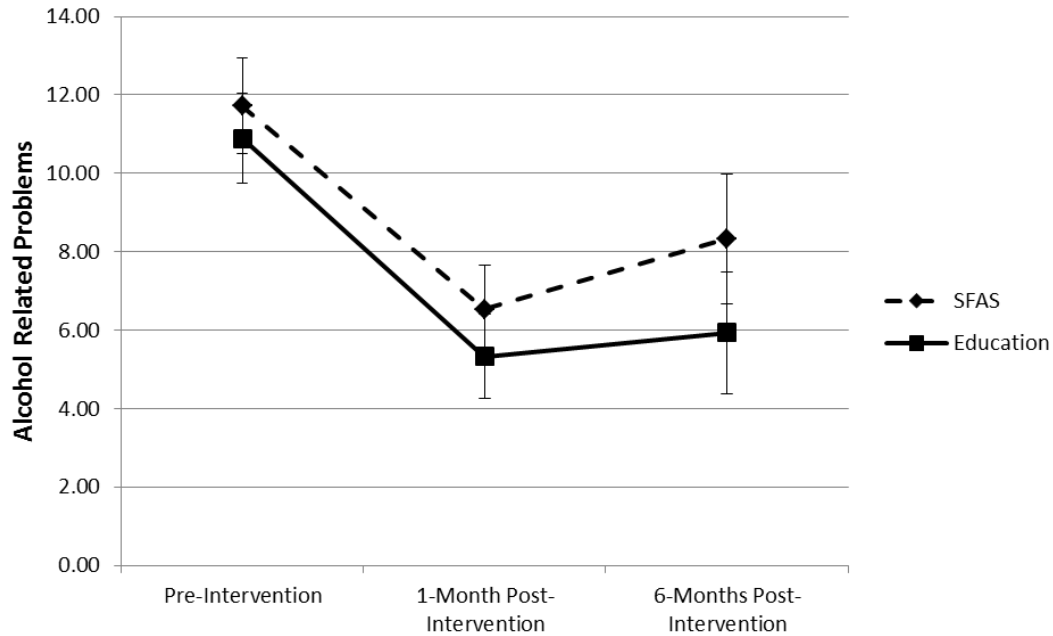


Figure 4. Changes in alcohol related problems by condition

Drug use and problems. A series of 2 (group) X 3 (time) mixed-model repeated measures analyses were conducted to compare treatment conditions on number of days using any drug, number of days using marijuana, and drug related problems. After controlling for gender and ethnicity there was a significant main effect for time on number of days using any drug, [$F(2, 50.51) = 3.70, p = .032$], days using marijuana, [$F(2, 44.73) = 6.85, p = .003$], and drug related problems, [$F(2, 53.65) = 5.26, p = .008$]. Additionally, there was a significant interaction between condition and time on number of days using marijuana; participants in the BMI+SFAS condition used marijuana on significantly fewer days at the 6 month follow-up ($M = 6.46$) compared to those in the BMI+Education condition ($M = 11.38$), [$F(2, 45.10) = 4.10, p = .023$; see figures 5-7]. Despite the lack of a significant interaction between the two groups and number of days using drugs and drug related problems, some effect size discrepancies did emerge. The treatment groups were fairly similar in effect size reductions in drug use days at the 1-month follow-up ($d_{ws} = .83$ and $.70$, for the SFAS and EDUC respectively) with a slight

advantage for the BMI+SFAS over the BMI+EDUC at the 6-month follow-up ($d_{ws} = .75$ and $.35$, respectively). Effect size reductions in drug-related problems were similar for BMI+SFAS and BMI+EDUC at both the 1-month follow-up ($d_{ws} = .57$ and $.45$, respectively) and the 6-month follow-up ($d_{ws} = .47$ and $.33$, respectively). However, the BMI + SFAS seemed especially potent in number of days using marijuana demonstrating larger effect size reductions compared to those in the BMI + EDUC at the 1-month follow-up ($d_{ws} = 1.11$ and $.65$, respectively) and at the 6-month follow-up ($d_{ws} = 1.03$ and $.29$, respectively).

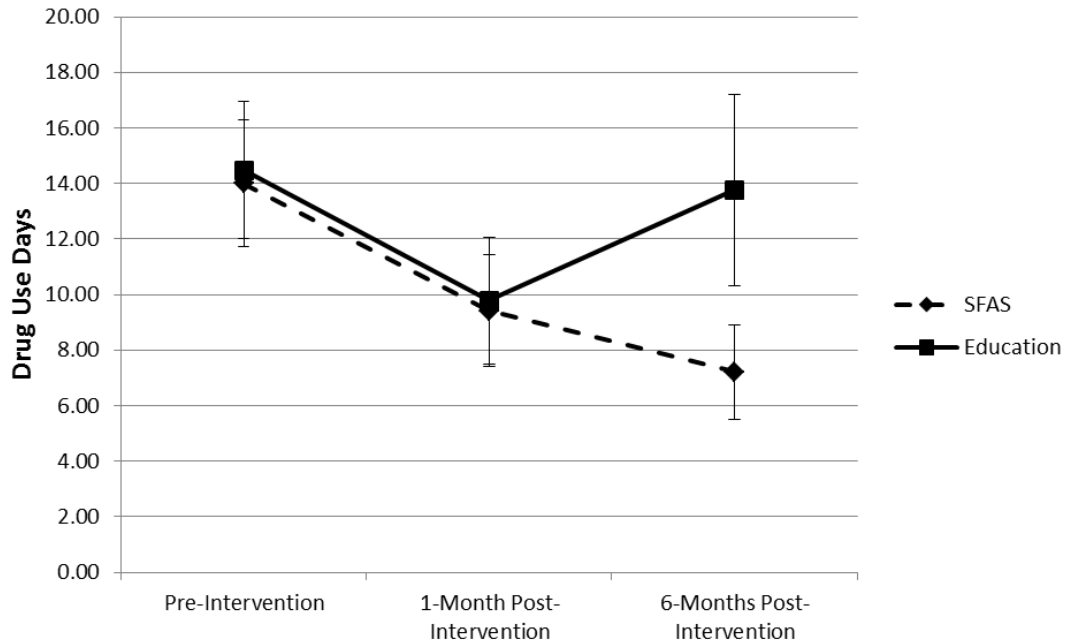


Figure 5. Changes in past month number of days using any illicit drug by condition

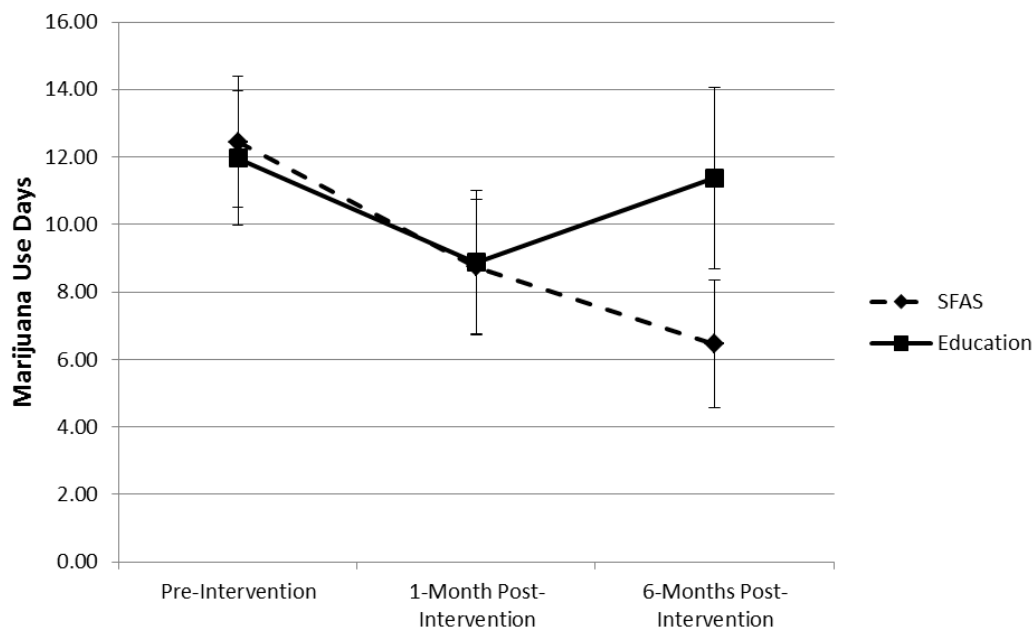


Figure 6. Changes in number of days using marijuana by condition

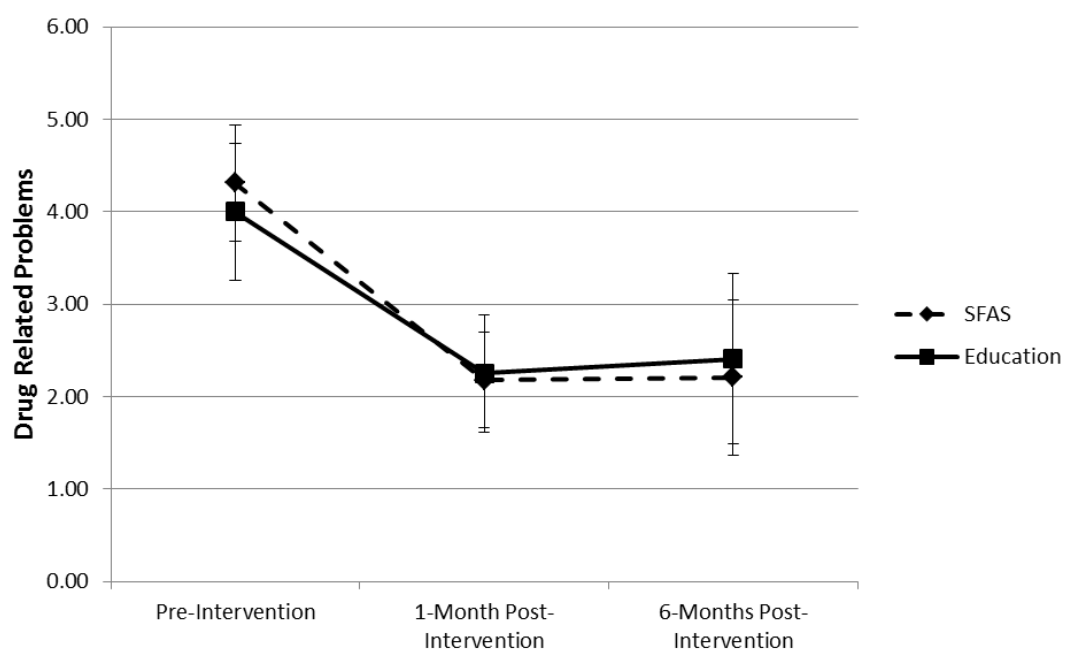


Figure 7. Changes in drug related problems by condition

Table 5

Pre-Post Means (SD) and Effect Sizes for Drinking and Drug Use Outcomes

<i>DV</i>	Baseline	1-Month	6-Month	Within Subjects Effect Size (d_{ws})	
Group Status	<i>M</i> (SD)	<i>M</i> (SD)	<i>M</i> (SD)	1-Month	6-Month
<i>Drinks Per Week</i>					
SFAS	15.34 (9.90)	9.58 (9.35)	9.97 (10.59)	1.04	.78
Education	11.53 (8.97)	7.95 (8.59)	9.36 (12.77)	.74	.46
<i>Binge Episodes</i>					
SFAS	4.74 (4.17)	2.90 (3.75)	3.833 (4.74)	.71	.43
Education	3.23 (3.32)	2.36 (3.42)	3.07 (5.12)	.47	.38
<i>Alcohol Related Problems</i>					
SFAS	11.72 (8.60)	6.53 (7.48)	8.33 (9.46)	.92	.64
Education	10.89 (7.89)	5.33 (6.85)	5.94 (8.78)	.95	.85
<i>All Drug Use Days</i>					
SFAS	14.00 (13.72)	9.41 (11.37)	7.21 (8.72)	.83	.75
Education	14.48 (13.72)	9.78 (11.86)	13.77 (16.19)	.70	.35
<i>Marijuana Use Days</i>					
SFAS	12.45 (10.74)	8.74 (10.43)	6.46 (9.12)	1.11	1.03
Education	11.97 (10.77)	8.88 (10.60)	11.38 (12.28)	.65	.29
<i>Drug Related Problems</i>					
SFAS	4.31 (3.76)	2.18 (2.96)	2.21 (4.28)	.57	.47
Education	4.00 (4.10)	2.25 (3.35)	2.41 (4.31)	.45	.33

Outcomes by Ethnicity. Additional mixed model repeated measures analyses were conducted to investigate potential interactions between ethnicity and treatment group on all outcome variables. Although no significant three-way interactions emerged

between ethnicity, time and condition on the drinking variables, there were significant interactions on two of the drug use variables. Specifically, Caucasian students in the BMI+SFAS condition reduced their number of days using any drug [$F(2, 49.54) = 5.52, p = .006$] and number of days using marijuana [$F(2, 44.01) = 4.87, p = .012$] significantly more than Caucasian students in the BMI + EDUC group. Treatment condition did not appear to impact drug use for minority students. See Figures 8-11 for mean differences in drug use variables across ethnicity and condition at the 6-month follow-up.

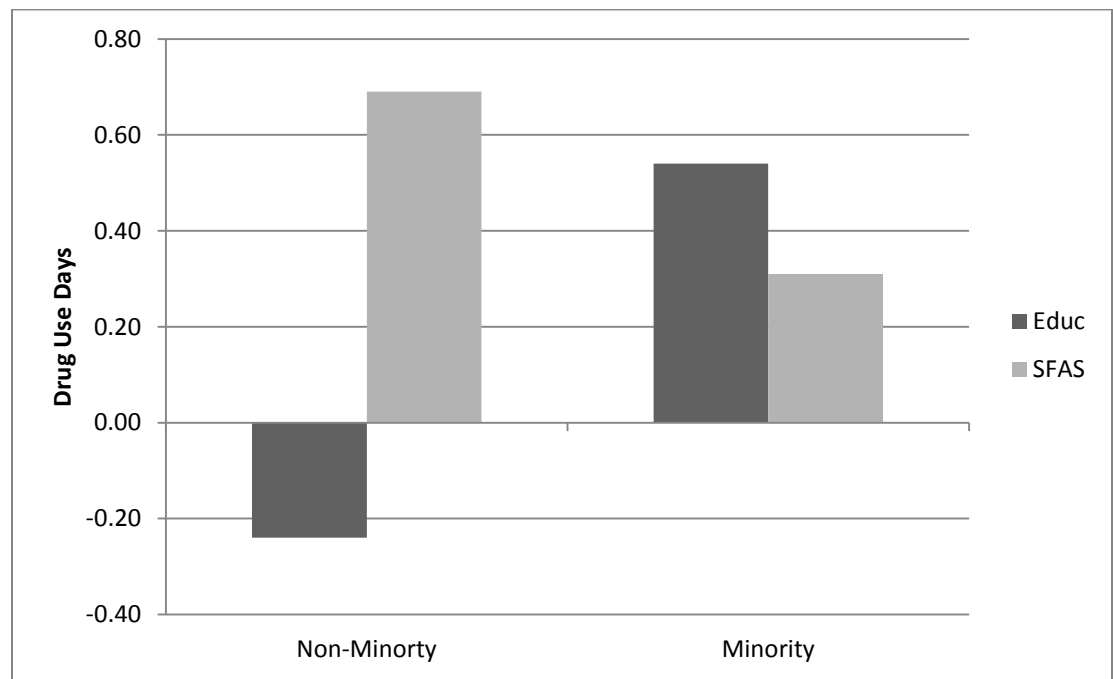


Figure 8. Changes in number of days using illicit drugs for non-minority and minority students by intervention condition at the 6-month follow-up

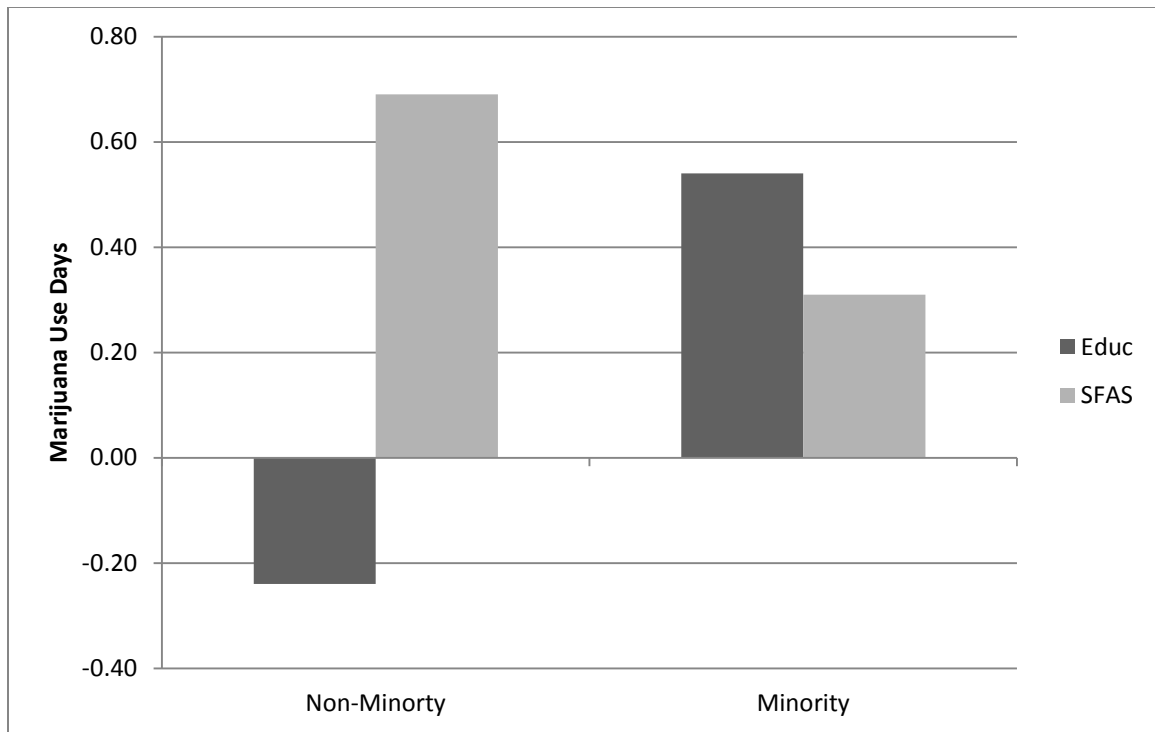


Figure 9. Changes in number of days using marijuana for non-minority and minority students by intervention condition at the 6-month follow-up

Discussion

The goal of the current study was to conduct a randomized controlled trial that examined the efficacy of an adapted motivational interviewing and behavioral economic substance-free activity session in an ethnically diverse college sample. The interventions focused on reducing both drug and alcohol misuse. Consistent with study hypotheses, the BMI+SFAS session was associated with greater reductions in overall substance use and monthly marijuana use in comparison to the BMI+Education condition that was equal in length and modality. Surprisingly, despite significant overall reductions, there was no treatment group differences for number of drinks per week, binge drinking episodes, combined illicit drug use or alcohol/drug related problems. Specific findings are discussed below in conjunction with study limitations.

Alcohol Consumption and Problems

Consistent with previous research demonstrating the efficacy of BMIs for alcohol misuse (Cronce & Larimer, 2011), across both conditions, participants reported decreases in drinks per week, binge episodes and alcohol related problems at 1 and 6 month follow-ups. Despite the lack of a significant treatment effect by conditions, participants in the BMI+SFAS condition demonstrated larger effect size reductions in drinks per week at both follow-ups and binge drinking episodes at the 1-month follow-up. Effect size reductions of alcohol-related problems were relatively equal across treatment conditions. The SFAS condition demonstrated comparable effect size alcohol reductions to the Murphy et al. (2012) study, especially with drinks per week. Although effect size reductions in binge drinking were slightly larger for the SFAS condition compared to the education session in the current study, effect sizes were larger in the Murphy et al study. The lack of advantage for the SFAS condition on alcohol related problems is inconsistent with the findings by Murphy and colleagues in which a BMI plus a similar supplemental intervention was related to fewer alcohol problems compared to a BMI + relaxation session control. Instead of relaxation, the current study utilized an education control group which is typically associated with poor outcomes (Hingson et al. 1997; Wells-Parker, 1995). However, to the authors' knowledge, education has never been delivered *after* a motivational intervention as it was done in this study (Barnett et al., 2004). For BMI alone, effect sizes range from .11-.40 (Carey et al., 2007; Larimer & Cronce, 2007). In the current study, the combination of BMI + EDUC demonstrated effect sizes ranges of .38-.95 illustrating the impact of our control group compared to standard BMI sessions. For alcohol related problems, the effect size reductions in the BMI+EDUC session were larger at both the 1-month ($d_{ws} = .95$) and the 6-month follow-up ($d_{ws} = .85$)

than the effect size reductions in the Murphy et al control group ($d_{ws} = .05, .26$). Perhaps the inconsistent findings between the current study and the Murphy et al study can be attributed to the combination of a BMI and educational components.

Another reason for the inconsistent findings between the current study and the Murphy et al. (2012a) study may be the inclusion of more minority students. Research has consistently demonstrated that minority students tend to drink less than Caucasian students, yet experience more alcohol-related problems (Zapolski, Pedersen, McCarthy, & Smith, 2014). Hence, even though participants reduced their drinking at follow-up, due to the diversity of our sample, participants may be less likely to experience fewer alcohol-related problems. Future research and interventions should focus on the consequences minorities experience due to alcohol consumption and the difficulty they have reducing problems despite reducing their drinking. Another possibility for the discrepancy between the two studies is the brevity of the current intervention, which was 25-30 minutes in length.

Drug Use and Problems

Participants in both conditions reported a decrease in number of days using illicit drugs at the 1-month follow-up, but at the 6-month follow-up, participants in the control group increased their use days at the 6-month follow-up whereas students in the SFAS group continued to decrease the number of days used. However, this difference was not significant and effect size reductions were similar across conditions. This is consistent with previous drug use literature demonstrating small but insignificant reductions in illicit drug use following BMI (McCambridge & Strang, 2004). Although both groups reduced the number of days using marijuana at the 1-month follow-up, those in the SFAS condition made larger effect size reductions that continued at the 6-month follow-up.

Students in the SFAS group made significant reductions in the number of days using marijuana at 6-months compared to those in the control group whose use days returned to baseline levels. These findings improve upon the reductions noted in previous studies in that the significant reduction in number of days using marijuana at the 1-month follow-up was maintained at the 6-month follow-up and demonstrated much larger effect size reductions ($d_{ws} = 1.03$) than BMI alone ($d_{ws} = .13$; White et al., 2006). Both groups decreased their drug related problems at 1-month which gradually plateaued at the 6-month follow-up, with similar effect size reductions.

The SFAS appears to be especially beneficial in reducing the number of days using marijuana as evidenced by the large effect size reductions in comparison to the education group. Both groups received personalized feedback on their drug use during the BMI session; hence the reduction in marijuana use may be attributed to the various components in the SFAS session. For example, the focus on academic and career related goals may have been effective in reducing use at least in part, as many students would lose their scholarship if they were caught with drugs. Drug violations are also problematic for licensure in many professions and this information was provided to students interested in those professions. Besides academic and career related goals, the SFAS' emphasis on developing alternative leisure activities or coping with stress and negative affect may also played a role in the decrease in number of days using marijuana. In contrast, providing generic information about drug effects and risks may not lead to reductions in use.

Ethnicity and Alcohol and Drug Outcomes

Because of the differences in substance use and abuse among different ethnicities, as well as differences in response to treatment, we adapted the alcohol BMI and SFAS

sessions to better accommodate a diverse population. We did this by tailoring alcohol and drug normative data to specific ethnicities in the alcohol BMI, as well as the inclusion of minority clubs/organizations and the impact of racism and discrimination in the SFAS. Hence, we were interested in the impact of ethnicity on treatment outcomes. Our results indicated that there was no interaction between ethnicity and treatment condition on alcohol related variables, but that Caucasian students who were in the BMI + SFAS condition reduced their illicit drug use and marijuana use significantly more than Caucasian students in the BMI + EDUC group. Effect size reductions were fairly similar across treatment group for the aforementioned variables for Caucasian students at the 1-month follow-up, but larger effect size reductions were found for Caucasian students in the BMI+SFAS for any illicit drug use days and number of days using marijuana at the 6-month follow-up ($d_{ws} = .69, .67$, respectively) compared to Caucasian students who were in the BMI+EDUC control group ($d_{ws} = -.24, -.18$, respectively). Although the SFAS does not appear to be uniquely effective for minority students, it does appear to be more beneficial for Caucasian students who were predominantly heavier drinking and drug using college students. The significant difference in drinks per week and heavy drinking episodes between the SFAS and education session at baseline might be playing a role in this finding. Additionally, the small sample size hinders our ability to meaningfully detect and interpret conditions by ethnicity interactions. Future research should examine ethnicity and treatment outcomes with a larger sample.

Implications and Future Directions

These results suggest that the SFAS may enhance the effects of a traditional BMI for combined substance use. The SFAS appears to be especially beneficial in reducing marijuana use as evidenced by the large effect size reductions. Both groups received

personalized feedback on their drug use during the BMI session, hence the reduction in days used may be attributed to the content of the SFAS session. This included a focus on academic and career related behaviors as well as coping with negative mood. Although there was no unique advantage for the SFAS over the education control group in regard to alcohol related variables, the effect size reductions ranged from moderate to large which is an improvement from the typically small to moderate effect sizes evident in BMI's alone (Carey et al., 2007; Larimer & Crounse, 2007). Additionally, this particular sample included lighter drinkers in comparison to the Murphy et al. (2012a) which included more stringent enrollment criteria. These findings are consistent with behavioral economic theory and suggest that heavy drinking and drug using students benefit from a brief intervention that focuses on the academic, career and financial outcomes associated with behavior allocated to substance use versus substance free activities (Bickel et al., 2012; Bickel et al., 2013; Correia et al., 2005; Heinz et al., 2012; Higgins, Heil, & Plebani-Lussier, 2004). In addition to the brevity and the potential cost effectiveness of the BMI+SFAS intervention, its focus on academic engagement is consistent with the goals and values of colleges and universities. Future research should examine the impact of the SFAS supplemental session on retention rates. Although this study did not evaluate participant's reaction or satisfaction with the intervention, future research should investigate the acceptability of this intervention with students. It would also be informative to examine the SFAS intervention with other populations such as student veterans.

It is especially promising that the BMI plus SFAS session was associated with reductions in marijuana use days as the literature on interventions for college student drug use is limited (Dennhardt & Murphy, 2013). Available evidence suggests that

BMIs may be effective for drug use, but effect sizes are relatively small and tend to diminish at later follow-ups (Fischer et al., 2013, Lee et al., 2013; Lee et al., 2010). The results of the present study suggest that a standard MI plus a supplemental intervention targeting mood and substance-free activities may be especially efficacious for college students who use alcohol and illicit drugs. The fact that drug users in particular may benefit from this type of intervention is consistent with a study by Conrod and colleagues (2011) in which a two-session coping skills intervention that aimed to target relevant personality and mood factors that may contribute to substance use, was found efficacious for adolescent drug users. However, our sample was limited in that it was not selected on the basis of drug use and included some students who were not using drugs.

Past research typically illustrates more immediate effects of brief interventions that are not maintained at later follow-up assessments (Barnett et al., 2004; McCambridge & Strang, 2004), yet the advantage for SFAS was seen at 6-month follow-up and not at 1-month. This may in part be due to the fact that previous research assessed outcomes at a 3 month follow-up compared to the 1 month follow-up period in the current study. This suggests that changes in drug use may not be immediate. Additionally, our study compared two active interventions where prior studies used assessment only controls. However, reductions found in prior studies were not maintained at the 6-month follow-up, whereas the participants in our study demonstrated large effect size reductions that continued at 6 months. This may also be explained by the nature of the intervention. The primary goals of the SFAS were to encourage students to become more engaged in academic and other substance-free activities and to learn coping skills to deal with negative affect. Although we are unable to evaluate the specific mechanisms of change in this study, prior research suggests that increased involvement in extracurricular

activities and improved coping/mood result in increases in substance-free reinforcement which in turn reduced the reinforcing value of substance use (Bickel et al., 2012; Bickel et al., 2013; Correia et al., 2005; Higgins et al., 2004). It is possible that becoming more involved in extracurricular or volunteering opportunities, and successfully utilizing coping skills may take a substantial amount of time to implement and therefore would be less likely to impact drinking or drug use until more than 1 month after an intervention. Furthermore, these types of changes may be more likely to lead to sustained changes, compared to changes spurred by the motivational feedback that primarily highlight the risks to drug use. With the current study and the Murphy et al. study (2012a) only assessing out to 6-months, future research with the SFAS is needed that incorporates long-term follow-up assessments.

Limitations

One limitation of this study is the relatively small sample size, which likely reduced our ability to identify significant differences between groups on drinking related variables. Similarly, attrition, especially at the six month follow-up may have made it more difficult to detect effects. Another limitation is that participants did not complete baseline and subsequent follow-up measures during the same time in the semester. College students tend to have periods of heavier (spring break, summer break) and lighter drinking (midterm exams, finals; Del Boca, Darkes, Greenbaum & Goldman, 2004), and we were unable account for this in assessing outcomes. This may have led to changes in substance use that are not attributable to the interventions, although it would not account for group differences. Similarly, this study did not include a no-intervention control condition and this makes it difficult to interpret across-condition changes in substance use. All students received a BMI and although the efficacy of these interventions is well

established for alcohol use, there is far less evidence on the effects on drug use (Dennhardt & Murphy, 2013 in press; Grossbard et al., 2010; White et al., 2006). It would have been valuable to examine the effects of the interventions compared to no-intervention control. It would also have been interesting to compare the effects to a condition that included a longer standard BMI to examine whether the content of the supplement interventions is important or if the additional time with an interventionist is the component that is valuable. For example, the Murphy et al. (2012a) study conducted a 50 minute BMI followed by a 50 minute SFAS session that was completed one week after the BMI. Perhaps this delay in interventions allowed for the significant reduction in heavy drinking and alcohol related problems that were not evident in the current study. Despite the clinical implications of the delayed intervention, it may be difficult to have students come back for two sessions in a real world setting, and it would require more clinician resources. Similarly, the amount of topics covered in both sessions may have been too much for a relatively brief intervention. Another limitation of this study was the relatively short follow-up period. It is possible that results would be different after a longer period of time after the intervention. Changes in coping with stress and engagement in substance free activities may particularly be more likely to have an effect on substance use at a later time due to the time and effort it may take to enact changes in these areas. In regard to measurement, this study did not assess student's self-efficacy to make desired changes which would be interesting to examine in future studies as a potential mechanism of change. Additionally, the current study did not measure participants reaction and/or satisfaction with the intervention. Finally, ethnicity was confounded with drinking and drug use level making it difficult to analyze and interpret ethnic differences.

A potential reason for the discrepancy between the current study and the Murphy et al. (2012a) study may be the brevity of the current intervention. Both the BMI and SFAS intervention in this study were approximately 25-30 minutes. BMIs for college student drinking or drug use have varied in length but are generally around 45 minutes to 1 hour. The Murphy and colleagues study (2012a) which found favorable effects for the supplemental intervention targeting substance-free activities, consisted of a 40-60 minute BMI followed by a 40-60 minute supplemental session or a 30-40 minute relaxation control that occurred approximately one week later (Murphy et al., 2012a). In this study, a BMI plus SFAS session or education session control were conducted consecutively in a total of 60 minutes in order to evaluate what would be a more feasible, briefer, total intervention package. It is possible that this is too brief for the SFAS session to have an impact on behavioral economic factors or that there is some benefit to having a week between the BMI and the supplemental session. However, the effect sizes across the two trials for drinks per week were similar and the Murphy et al. (2012a) study did not examine drug use outcomes. Perhaps with a longer follow-up, those in the SFAS session would demonstrate a continued decrease in drinking and drug use in comparison to the education control group.

Despite the possible disadvantages of this shorter version of the BMI + SFAS intervention, there are many logistical and financial advantages. Requiring students to schedule and consistently appear for two appointments can be logistically difficult for both the university and the student. Shorter interventions may be especially useful for colleges with limited resources or a large number of students who require intervention. Additionally, this shorter intervention demonstrated larger effect size reductions in drinks per week than other BMI's and appears to be efficacious in reducing drug use; therefore

may be particularly indicated with students abusing drugs. Studies have demonstrated that stepped care, different levels of care according to treatment response, may be a promising model for college student substance use and that not all students require intensive intervention (Borsari et al., 2012). The results of the current study and Murphy and colleagues (2012a) findings suggest that mood and behavioral economic factors may also be useful to consider when deciding on appropriate intervention strategies for college student substance users and should be considered for inclusion in BMI's for alcohol and drug use.

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Appendix A

CONSENT FORM: Phase 1 Screening Survey

1. Purpose of the Project

You are being asked to take part in a University of Memphis research project. The purpose of this study is to collect information on college lifestyle and health-related behaviors among University of Memphis Students.

2. Explanation of Procedures

You will be asked to complete several questions concerning health related behavior including alcohol and drug use. Some participants will be contacted and invited to participate in phase 2 of this research study.

3. Risks or Discomforts

The risks in this study are considered minimal. These questions are commonly used in research.

4. Benefits

There are no clear benefits to participating in this study. You may find it helpful to report on your health-related behaviors.

5. Confidentiality

Participation in this study and information gathered from this study will be kept confidential to the extent of the law. The findings of the study may be published and individual students will not be identified. By law, there are a few limits to confidentiality. These limits were developed in part to insure the safety of research participants. The researchers are required by law to take some action if there is suspicion that you may harm yourself or somebody else or there is suspicion that a child may be in danger. If any of these situations should occur, we would attempt to contact you prior to taking any action.

6. Decision to participate and right to quit at any time

Participation is voluntary and you may quit at any time. A decision to quit the study will not affect your relationship with the University of Memphis. You also may skip or not answer any question(s) you do not want to answer.

Questions about the study should be directed to Ali Yurasek (myurasek@memphis.edu) or Ashley Dennhardt (apedersn@memphis.edu). You may also contact the faculty supervisor on this project, Dr. James Murphy (jgmurphy@memphis.edu; phone, 678-2630). For questions regarding your rights as a research participant contact the Chair of the Institutional Review Board for the Protection of Human Subjects at 678-2533. The University of Memphis does not have any funds budgeted for compensation for injury, damages, or other expenses.

CONSENT TO PARTICIPATE

I HAVE READ THE CONSENT FORM AND FULLY UNDERSTAND IT. ALL MY QUESTIONS HAVE BEEN ANSWERED. I AGREE TO TAKE PART IN THE STUDY, AND I WILL RECEIVE A COPY OF THIS COMPLETED FORM.

Signature of student

Date

Appendix B
Health Related Behavior Questionnaire

1. Gender: 1) Male 2) Female

2. Age: ____ ____ years

3. What term(s) below best describes your race/ethnicity?
{Choose all that apply}
☐ White or Caucasian
☐ Hispanic or Latino
☐ Asian
☐ Black or African American
☐ American Indian or Alaska Native
☐ Other: _____

4. Year in school as of the Fall 2011 semester:
 1) Freshman 3) Junior
 2) Sophomore 4) Senior 5) Graduate Student

5. Student status for current semester?

 Full time student ____ part time student ____ will not be enrolled in school ____

6. In the past month, on how many days did you smoke 1 or more cigarettes?
 a. 0 days
 b. 1-3 days per week
 c. every day or almost every day

7. (Question for Males Only) In the past month, on how many days did you have 5 or more drinks in a row (Note: a drink is defined as 12 oz. of beer, 4 oz. of wine, or 1.5 oz. of hard liquor)?
 a. 0 days
 b. 1 day
 c. 2-3 days
 d. 4 or more days

8. (Question for Females Only) In the past month, on how many days did you have 4 or more drinks in a row? (Note: a drink is defined as 12 oz. of beer, 4 oz. of wine, or 1.5 oz. of hard liquor)?
 a. 0 days
 b. 1 day
 c. 2-3 days
 d. 4 or more days

6. In the past month, on how many days did you use illicit drugs? (include prescription drugs if used without a prescription)
 a. 0 – 3 days (less than once a week)
 b. 4 - 8 days (1 -2 times per week)

c. 9 or more days (2 or more times per week)

Appendix C

Telephone Scripts for Students Invited to Participate in the Clinical Trial

Hello, this is (name) from the University of Memphis Psychology Department. I am calling to invite you to participate in an additional part of the research project that you participated in (during class/online) last week. If you choose to participate you could receive \$55 total. Do you have a minute so that I can tell you a bit about the study? The study involves coming in for a 2-hour session within the next week. This session will involve filling out questionnaires asking about your lifestyle, your use of alcohol or drugs, and your perception of others' alcohol consumption and then having a discussion about this information. Students will then complete a brief discussion about adjustment to college and the college lifestyle or be given additional information about alcohol and drugs. We randomly assign you to one of these conditions. At the end of the session you would receive \$25. All information collected about you will remain confidential. You will also be eligible to complete 2 additional sessions over the next year where you would come in complete some surveys. You would receive \$10 for completing each of these survey sessions and could earn an additional \$10 if you complete both of these sessions within a week of the scheduled appointment. How does this sound? Would you like to participate? You are not obligated to participate, and you may choose to withdraw participation at any time.

Appendix D

CONSENT FORM: Phase 2

1. Purpose of the Project

You are being asked to take part in a University of Memphis research project. The purpose of this study is to evaluate the effects of two approaches for improving college adjustment and reducing risky alcohol consumption and drug use.

2. Explanation of Procedures

You will be asked to complete several questionnaires related to your college adjustment, your mood, drinking and things that happen when you drink or use drugs, and your attitudes regarding drinking and other activities. You will then complete a one-on-one conversation about your drinking and drug use including receiving individualized feedback about your risks of your use. This session should take approximately 30- 40 minutes. Then, you will be assigned to one of two additional 30-40 minute sessions that will take place immediately after the first session. In one condition you would have a conversation about your college experience and strategies for coping with stress, and in the other condition you would receive additional information about alcohol and drug use and the effects of these substances on the body. We do not know whether one of these approaches is more helpful than the other. The group you are assigned to is a matter of chance. A procedure similar to a flip of a coin (called randomization) will be used to figure out which approach you receive.

Follow-up assessments will be held 1 and 6 months from now. During these sessions, you will complete the same questionnaires related to your college adjustment, drinking and things that happen when you drink, drug use, and your attitudes regarding drinking and other activities. You will receive \$10 or 1 hour of research credit towards your psychology course for each of the 2 sessions that you complete. If you attend each of these appointments within two weeks of the scheduled date, you will earn an additional \$15.

In order for this project to have scientific value, we need to know whether our intervention was helpful. Therefore, we will make every effort to contact you for these follow-up interviews. As part of your participation in this project, we will ask your permission to contact another person who knows you well enough to know how to contact you over the next six months. We will not inform any individual about the nature of research study or speak with them about any of the confidential material you have given us as part of this study.

Audiotapes may be made of the sessions so that we can check to make sure the project procedures are being implemented as planned. Audiotapes will be identified only by an identification number and will be stored separately from all other information. Audiotapes will be destroyed at the end of the study.

3. Risks or Discomforts

The risks in this study are considered minimal. These questionnaires are commonly used in research. You may experience some emotional discomfort in discussing your experiences with drinking and drug use.

4. Benefits

We cannot guarantee that you will receive any benefits from this study. A possible benefit is that you may learn more about your alcohol and drug use.

5. Alternative Sources of Alcohol or Drug Information.

If you choose not to participate in this study, we can provide you with information on other resources for obtaining information on alcohol and drug use.

6. Confidentiality

Participation in this study and information gathered from this study will be kept confidential to the extent of the law. The findings of the study may be published and individual students will not be identified. By law, there are a few limits to confidentiality. These limits were developed in part to insure the safety of research participants. The researchers are required by law to take some action if there is suspicion that you may harm yourself or somebody else or there is suspicion that a child may be in danger. If any of these situations should occur, we would attempt to contact you prior to taking any action.

6. Decision to participate and right to quit at any time

Participation is voluntary and you may quit at any time. A decision to quit the study will not affect your relationship with the University of Memphis. You also may skip or not answer any question(s) you do not want to answer.

Questions about the study should be directed to Ali Yurasek (myurasek@memphis.edu) or Ashley Dennhardt (apedersn@memphis.edu). You may also contact the faculty supervisor on this project, Dr. James Murphy (jgmurphy@memphis.edu; phone, 678-2630). For questions regarding your rights as a research participant contact the Chair of the Institutional Review Board for the Protection of Human Subjects at 678-2533. The University of Memphis does not have any funds budgeted for compensation for injury, damages, or other expenses.

CONSENT TO PARTICIPATE

I HAVE READ THE CONSENT FORM AND FULLY UNDERSTAND IT. ALL MY QUESTIONS HAVE BEEN ANSWERED. I AGREE TO TAKE PART IN THE STUDY, AND I WILL RECEIVE A COPY OF THIS COMPLETED FORM.

Signature of student

Date

Appendix E

DEMOGRAPHICS

Participant # _____

1. Gender: 1) Male 2) Female
2. Age: ____ years
3. What term(s) below best describes your race/ethnicity? (Choose all that apply)
 - ☐ White or Caucasian
 - ☐ Hispanic or Latino
 - ☐ Asian
 - ☐ Black or African American
 - ☐ Native Hawaiian or Other Pacific Islander
 - ☐ American Indian or Alaska Native
 - ☐ Other: _____
(please specify)
4. Where are you living? (Circle all that apply)
 - 1) Residence hall or other university housing
 - 2) Fraternity or sorority
 - 3) House or apartment with one or both parents, or other adult relatives
 - 4) House or apartment with roommate or friends
5. Do you belong to a fraternity or sorority?
 - 0) No
 - 1) Yes
6. How many course credits are you registered for this semester? _____
7. What was your high school GPA? _____ What was the GPA scale range (e.g., 0 – 4.0, 0 – 100, etc.). _____
8. What is your overall college GPA _____ N/A; this is my 1st semester _____
9. What was your GPA in the previous semester? _____ N/A; this is my 1st semester _____
10. What was your Verbal SAT score _____ 11) What was your Math SAT score _____
12. What was your ACT score _____
13. What was your high school class rank?
 - a) bottom 50% b) top 50 % c) top 25% d) top 10% e) I don't know

What's a
Standard Drink?



One 12 oz.
can, bottle,
or glass of
beer



One 5 oz.
glass of
wine



One mixed
drink
containing
one shot of
liquor

The questions below ask about your alcohol consumption.

- 1) For the **past month**, fill in for each calendar day the number of standard drinks you **usually drink** on that day **during a typical week**, and the number of hours over which you consume this amount (i.e., the time from 1st sip to last sip). When we say one drink, we mean 12 oz. of beer, 5 oz. of wine, or 1.5 oz. of hard liquor (see picture on the left). Malt liquor is stronger than regular beer, so one 40 oz. Malt Liquor beverage such as Colt 45 counts as 5 standard drinks. Fill in an amount for each of the 7 days. If you do not typically drink on a given day, fill in 0 for that day.

Day	Sund ay	Mond ay	Tuesd ay	Wednesd ay	Thursd ay	Frida y	Saturd ay
# of drinks usually consum ed							
# of hours							

- 3) Please provide the following information which is necessary to estimate
your blood alcohol level

What is your current weight? _____ lbs.

What is your height? Feet _____ Inches _____

QUESTIONS FOR MALES ONLY

1. **IN THE PAST MONTH** how many times have you had 5 or more drinks (in one occasion)? _____ times
2. How many times **IN THE PAST MONTH** have you had **5 or more drinks in 2 hours or less**? _____ times

QUESTIONS FOR FEMALES ONLY

1. **IN THE PAST MONTH** how many times have you had 4 or more drinks (in one occasion)? _____ times
2. How many times **IN THE PAST MONTH** have you had **4 or more drinks in 2 hours or less**? _____ times

EVERYONE

3. In the past month, how many times have you been drunk or intoxicated? _____ times

4. In the past month, has your drinking: increased ____ decreased ____ or stayed the same ____? (check one response)
5. How many standard drinks (12 oz. beer, 5 oz. wine, or 1.5 oz. hard liquor) do you think you will have the next time you go to a party or bar ____? Over how many hours will you consume these drinks ____?
6. What is the greatest number of standard drinks you have consumed in any one occasion over the past month? ____
Over how many hours did you consume these drinks (first sip to last sip)? hours
____ minutes ____

DUQ. Please answer these questions about your use of the following drugs. Your answers are completely private and confidential.

	# of days used in the <u>PAST MONTH</u>	Amount Used	Did you use with Alcohol?
1. Marijuana (i.e., weed, pot, etc.)	___ ___ days		Yes/no
2. Cocaine	___ ___ days		Yes/no
3. Designer drugs (e.g., ecstasy, MDMA, GHB, etc.)	___ ___ days		Yes/no
4. Hallucinogens (e.g., mushrooms, LSD, PCP),	___ ___ days		Yes/no
5. Heroin	___ ___ days		Yes/no
6. Methamphetamine (i.e., crystal meth)	___ ___ days		Yes/no

Have you used the following prescription drugs other than as prescribed to you by a doctor/nurse (i.e., have you taken any of these drugs recreationally)?

	# of days used in the <u>PAST MONTH</u>	Amount Used	Did you use with Alcohol?
a. Sleeping medications (e.g., Ambien, Halcion, Restoril)	___ ___ days		Yes/no
b. Sedative or anxiety medications (e.g., Ativan, Xanax, Valium, Klonopin)	___ ___ days		Yes/no
c. Stimulant medications (e.g., Ritalin, Dexedrine, Adderall, Concerta)	___ ___ days		Yes/no
d. Pain medication (e.g., Vicodin, OxyContin, Tylenol 3 with Codeine)	___ ___ days		Yes/no

YAACQ

The following is a list of things that sometimes happen to people either during, or after they have been drinking alcohol. Select either YES or NO to indicate whether that item describes something that has happened to you

IN THE PAST MONTH.

In the <u>past month...</u>	NO	YES
1. While drinking, I have said or done embarrassing things.	no	yes
2. The quality of my work or schoolwork has suffered because of my drinking.	no	yes
3. I have felt badly about myself because of my drinking.	no	yes
4. I have driven a car when I knew I had too much to drink to drive safely.	no	yes
5. I have had a hangover (headache, sick stomach) the morning after I had been drinking.	no	yes
6. I have passed out from drinking.	no	yes
7. I have taken foolish risks when I have been drinking.	no	yes
8. I have felt very sick to my stomach or thrown up after drinking.	no	yes
9. I have gotten into trouble at work or school because of drinking.	no	yes
10. I often drank more than I originally had planned.	no	yes
11. My drinking has created problems between myself and my boyfriend/girlfriend/spouse, parents, or other near relatives.	no	yes
12. I have been unhappy because of my drinking.	no	yes
13. I have gotten into physical fights because of drinking.	no	yes
14. I have spent too much time drinking.	no	yes
15. I have not gone to work or have missed classes at school because of drinking, a hangover, or other illness caused by drinking.	no	yes
16. I have felt like I needed a drink after I'd gotten up (that is, before breakfast).	no	yes
17. I have become very rude, obnoxious or insulting after drinking.	no	yes
18. I have felt guilty about my drinking.	no	yes
19. I have damaged property, or done something disruptive such as setting off a false fire alarm, or other things like that after I had been drinking.	no	yes
20. Because of my drinking, I have not eaten properly.	no	yes
21. I have been less physically active because of drinking.	no	yes
22. I have had "the shakes" after stopping or cutting down on drinking	no	yes
23. My boyfriend/girlfriend/spouse/parents have complained to me about my drinking.	no	yes
24. I have woken up in an unexpected place after heavy drinking.	no	yes
25. I have found that I needed larger amounts of alcohol to feel any effect, or that I could no longer get high or drunk on the amount that used to get me high or drunk.	no	yes
26. As a result of drinking, I neglected to protect myself or my	no	yes

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

How many times in the **past 6 months** have you driven a car when you knew you had too much to drink to drive safely?

a. 0 times b. 1-2 times c. about once a month d. about once week e. more than once a week

DASS21

Please read each statement and circle a number 0, 1, 2 or 3 that indicates how much the statement applied to you *over the past week*. There are no right or wrong answers. Do not spend too much time on any statement.

The rating scale is as follows:

- 0 Did not apply to me at all
- 1 Applied to me to some degree, or some of the time
- 2 Applied to me to a considerable degree, or a good part of time
- 3 Applied to me very much, or most of the time

1	I found it hard to wind down	0 3	1	2
2	I was aware of dryness of my mouth	0 3	1	2
3	I couldn't seem to experience any positive feeling at all	0 3	1	2
4	I experienced breathing difficulty (e.g., excessively rapid breathing, breathlessness in the absence of physical exertion)	0 3	1	2
5	I found it difficult to work up the initiative to do things	0 3	1	2
6	I tended to over-react to situations	0 3	1	2
7	I experienced trembling (e.g., in the hands)	0 3	1	2
8	I felt that I was using a lot of nervous energy	0 3	1	2
9	I was worried about situations in which I might panic and make a fool of myself	0 3	1	2
10	I felt that I had nothing to look forward to	0 3	1	2
11	I found myself getting agitated	0 3	1	2
12	I found it difficult to relax	0 3	1	2
13	I felt down-hearted and blue	0 3	1	2

14	I was intolerant of anything that kept me from getting on with what I was doing	0 3	1	2
15	I felt I was close to panic	0 3	1	2
16	I was unable to become enthusiastic about anything	0 3	1	2
17	I felt I wasn't worth much as a person	0 3	1	2
18	I felt that I was rather touchy	0 3	1	2
19	I was aware of the action of my heart in the absence of physical exertion (e.g., sense of heart rate increase, heart missing a beat)	0 3	1	2
20	I felt scared without any good reason	0 3	1	2
21	I felt that life was meaningless	0 3	1	2

These are some questions about your academics and other activities.

Please estimate the **total** number of hours you spent in each the following activities over the past 7 days. Record you time use below. For example, if you worked 2 hours per day over the past 7 days, record 14 hours in the employment column.

1. Attending class or required labs/research hours (hours actually attended, not just what you are registered for) _____
2. Doing homework, studying, reading, going to the library, or any other school work outside of class. _____
3. Participating in social fraternity or sorority activities _____
4. Participating in other university organizations or programs (attending meetings, volunteering, etc.) excluding fraternities or sororities _____
5. Participating in an internship or volunteer activity related to your major or possible career _____
6. Participating in a community or civic organization or activity _____
7. Paid Employment _____
8. Exercise or sports _____
9. Family time (e.g., talking with parents, siblings, etc., in person or over phone) _____
10. Religious activity (e.g., church services, bible study, scripture reading, etc.) _____
11. Time spent with significant other/date (including in person, on phone and email/IM) _____
12. Time spent drinking or using drugs _____
13. Time spent using the internet (facebook, web-browsing, etc.) NOT including using the internet for academic or work activities _____

These are some questions about your school related activities and goals

14. In the past 2 weeks how many college classes have you skipped? _____ (do not include classes missed due to a legitimate illness)
15. What is your major(s) (if you are undeclared, list 1-2 majors you are considering)

16. What careers are you considering?

17. Do you plan to attend graduate school, medical school, or law school: no ____
yes____ maybe____

18. Are you involved in any campus organizations or programs (other than social
fraternity or sororities) right

now? ____no ____yes (if yes, please list)

19. Please list any hobbies or creative activities that you have pursued over the past few
years

20. Please list any hobbies or creative activities that you would like to pursue during
college

21. Please list any volunteer or service activities that you have engaged in over the past
few years

22. Please list any volunteer or service activities that you would like to pursue during
college

Multigroup Ethnic Identity Measure

Use the numbers below to indicate how much you agree or disagree with each statement.

4: strongly agree 3: somewhat agree 2: somewhat disagree 1: strongly disagree

- ___1. I have spent time trying to find out more about my own ethnic group, such as its history, traditions, and customs.
- ___2. I am active in organizations or social groups that include mostly members of my own ethnic group.
- ___3. I have a clear sense of my ethnic background and what it means for me.
- ___4. I like meeting and getting to know people from ethnic groups other than my own.
- ___5. I think a lot about how my life will be affected by my ethnic group membership.
- ___6. I am happy that I am a member of the group I belong to.
- ___7. I sometimes feel it would be better if different ethnic groups didn't try to mix together.****
- ___8. I am not very clear about the role of my ethnicity in my life. ****
- ___9. I often spend time with people from ethnic groups other than my own.
- ___10. I really have not spent much time trying to learn more about the culture and history of my ethnic group.****
- ___11. I have a strong sense of belonging to my own ethnic group.
- ___12. I understand pretty well what my ethnic group membership means to me, in terms of how to relate to my own group and other groups.
- ___13. In order to learn more about my ethnic background, I have often talked to other people about my ethnic group.
- ___14. I have a lot of pride in my ethnic group and its accomplishments.
- ___15. I don't try to become friends with people from other ethnic groups.*****
- ___16. I participate in cultural practices of my own group, such as special food, music, or customs.
- ___17. I am involved in activities with people from other ethnic groups.
- ___18. I feel a strong attachment towards my own ethnic group.
- ___19. I enjoy being around people from ethnic groups other than my own.
- ___20. I feel good about my cultural or ethnic background.

Racism and Life Experiences Scale - Brief Version

1. Overall, DURING YOUR LIFETIME, how much have you personally experienced racism, racial discrimination or racial prejudice? (Circle one)

not at all a little some a lot extremely

1. During THE PAST YEAR, how much have you personally experienced racism, racial discrimination, or racial prejudice?

not at all a little some a lot extremely

3. Overall, how much do you think racism affects the lives of people of your same racial/ethnic group?

not at all a little some a lot extremely

4. Think about the people close to you, your family and friends. In general, how much has racism impacted their life experiences?

not at all a little some a lot extremely

5. In general, how do you think people from your racial/ethnic group are regarded in the United States?

very negatively negatively neutrally positively very positively

6. In general, how frequently do you hear about incidents of racial prejudice, discrimination, or racism from family, friends, co-workers, neighbors, etc?

everyday at least about once or a few times
once a year
or less once a week twice a month a year

7. In general, how much do you think about racism?

rarely or never a little sometimes often very often

8. In general, how much stress has racism caused you during your lifetime?

none a little some a lot extreme

9. In general, how much stress has racism caused you during the past year?

none a little some a lot extreme

Appendix F

Personal Feedback for XXX

The information provided below is intended to help you evaluate your drinking behavior and whether or not you wish to change it. The information is based on your responses to the questionnaires you completed.

Your Beliefs About Drinking

	Frequency	Quantity	Drinks Per Week
Your estimated norm for African American females	3-4 times a week	3-4 drinks	about 13
Actual African American female student norms	2-4 times a week	about 2 drinks	about 5

Your Drinking Pattern

According to your responses to the questionnaires, you drink 3 days a week, and consume about 7 standard drinks (12 oz. beer, 5 oz. wine, 1.5 oz. liquor) a week. In comparison to other African American female college students, your percentile rank is 98. **This means that you currently drink more than 97% of African American female U of M students.** In other words, less than 2% of African American U of M females drink more than you.



Blood Alcohol Content

Factors that influence blood alcohol content:

- Alcohol quantity- the more you drink the higher your BAC
- Speed of drinking - if you space drinks out your BAC will not be as high as if you drink quickly.
- Gender- females process alcohol more slowly than males, and will thus have a higher BAC (and feel more impaired) than males.
- Weight -lighter individuals will have higher BACs than heavier individuals
- Food- drinking on an empty stomach will increase BAC

Fatal

(10 drinks/3.5 hours) your higher night .33)

At this level, people are typically **unconscious and unresponsive**. Alcohol affects the part of the brain that controls breathing, which can stop at this level of blood alcohol. Sometimes people reach this level by drinking a large amount of alcohol very quickly, like in drinking games. People at this level should be in an Emergency Room or hospital.

severe danger

In this range many people **lose consciousness**. If you get hurt, you may not realize it because you won't feel pain. There is a danger of aspiration—the gag reflex is impaired, so you can choke on vomit. For all of these reasons, people in this BAL range should not be left alone, and may need to be treated at an Emergency Room.

danger

At this level, people may **stagger or fall**. Since motor ability is severely impaired, there is a very high risk for getting hurt or having an accident. Since judgment is very poor, people don't make good decisions about safety. The risk of getting sick is also very high. It is common for memory loss or “blackouts” to occur.

disabled

In this range people have **slurred speech and may have trouble walking**. Emotions are exaggerated—some people become loud or aggressive, others become very quiet. Vomiting can occur, especially if BAL is reached rapidly. A level of .10 is legally intoxicated in all U.S. states.

impaired

At this level people can have **problems making good decisions** and may do things that they wouldn't do sober. Attention, reaction time and coordination are affected, which makes driving dangerous. People tend to believe they are functioning better than they actually are. Many states in the U.S., including Tennessee, have .08 as the level at which a driver is considered legally intoxicated.

moderate

**(1 drinks/.5 hrs) your lighter night
.03)**

This is a **social drinking range**. People sometimes feel relaxed and lightheaded. But, even at these levels, driving is affected (like the ability to pay attention to two or more things at once), and any BAL is illegal for people under 21.

Risks Associated with your Drinking

BINGE DRINKING-

Binge drinking means consuming 5 or more drinks in an evening for a man, or 4 or more drinks in an evening for a women. Numerous studies have shown that most of the negative effects of drinking (e.g., accidents, sexual assaults, blackouts, fights, hangovers, etc.) occur on binge drinking nights.

You reported 12 binge drinking nights in the past month. This places you at risk for negative consequences.

ALCOHOL-RELATED CONSEQUENCES

You reported experiencing the following negative consequences in the past six months as a result of your drinking. These consequences impacted the following areas:

- **Social**
 - You have done or said embarrassing things
 - There have been problems between you and your boyfriend/girlfriend/spouse, parents, or other near relatives
 - You have become very rude, obnoxious, or insulting
 - Your boyfriend/girlfriend/spouse/parents have complained to you about your drinking
 - You have said harsh or cruel things to someone
 - You have said things that you later regretted
 - You haven't been able to properly care for your child(ren)
- **Academic or Job-related**
 - The quality of your work or has suffered
 - You have gotten into trouble at work or school
 - You have not gone to work or missed classes at school because of drinking, a hangover, or illness caused by drinking
 - You have neglected your obligations to family, work, or school
 - You have received a lower grade on an exam or paper than you normally could have
- **How you think about yourself and feel**
 - You have felt badly about yourself
 - You have been unhappy
 - You have felt guilty
 - You have felt depressed or sad
- **Self-care**
 - You haven't eaten properly
 - You've been less physically active
 - You haven't slept properly
 - Your physical appearance has been harmed
 - You've been overweight

- You haven't been as sharp mentally
- You haven't had as much time to pursue activities or recreation
- You've had less energy or felt tired
- **Physical and memory-related effects**
 - You've had a hangover the morning after drinking
 - You've passed out from drinking
 - You've felt very sick to your stomach or thrown up after drinking
 - You've woken up in an unexpected place after drinking
 - You haven't been able to remember large stretches of time
 - You have awakened the day after drinking and found that you could not remember a part of the evening before
 - You've had a blackout
- **Risky Behaviors**
 - You have driven a car when you knew you had had too much to drink to drive safely
 - You have taken foolish risks
 - You have gotten into physical fights
 - You have damaged property, or done something disruptive such as setting off a false fire alarm, or other things like that
 - You have injured someone
 - You have done impulsive things that you later regretted
- **Risky Sexual Behavior**
 - You neglected to protect yourself or your partner from a sexually transmitted disease (planned) or an unwanted pregnancy
 - You have gotten into sexual situations that you later regretted
 - You have had sex with someone you wouldn't normally have sex with because of your drinking.
- **Risk Factors for Alcohol Dependence**
 - You often drank more than you had planned
 - You have spent too much time drinking
 - You felt like you needed a drink after you had gotten up (before breakfast)
 - You've had "the shakes" after stopping or cutting down on drinking
 - You needed larger amounts of alcohol to feel any effect, or you couldn't get drunk on the amount that used to get you drunk (tolerance)
 - You often ended up drinking on nights when you had planned not to drink
 - You often found it difficult to limit how much you drink
 - You have felt anxious, agitated, or restless after stopping or cutting down on drinking
 - You have tried to quit drinking because you thought you were drinking too much
 - You have thought about needing to cut down or stop drinking.

Important information for women

Women must be especially aware of their risk for sexual consequences and sexual assault when drinking. Often when people are drinking they believe that they are less likely to experience negative consequences, which makes them more likely to take risks. While it may seem that the level of intoxication of the man is most important, the truth is that sexual assault is more severe if both the man and the woman are drinking. The more a woman drinks, the more at risk she is of being severely assaulted. One reason for this is that **the more a woman drinks the less likely she will be to notice warning signs for sexual aggression in men.**

Other Drug Use

You told us that you smoke marijuana **1-2** days in the past month. Only 7.3% of U of M African American female students report using marijuana on a monthly basis. You smoke more than **93%** of African American females at the U of M.

You told us that you used cocaine **1-2** days in the past month. Less than 1% of U of M African American female students report using cocaine on a monthly basis. You use cocaine more than **99%** of African American females at the U of M.

You told us that you used designer drugs **1-2** days in the past month. Less than 1% of U of M African American female students report using designer drugs on a monthly basis. You use more than **93%** of African American females at the U of M.

You told us that you used hallucinogens **1-2** days in the past month. Only 7.3% of U of M African American female students report using this drug on a monthly basis. You use more than **93%** of African American females at the U of M.

You told us that you used heroin **1-2** days in the past month. Only 7.3% of U of M African American female students report using this drug on a monthly basis. You use more than **93%** of African American females at the U of M.

You told us that you used methamphetamine **1-2** days in the past month. Only 7.3% of U of M African American female students report using this drug on a monthly basis. You use more than **93%** of African American females at the U of M.

You told us that you used non prescribed sleeping medications **1-2** days in the past month. Only 7.3% of U of M African American female students report recreationally using this drug on a monthly basis. You smoke more than **93%** of African American females at the U of M.

You told us that you used non prescribed sedative or anxiety medications **1-2** days in the past month. Only 7.3% of U of M African American female students report recreationally using this drug on a monthly basis. You use more than **93%** of African American females at the U of M.

You told us that you used non prescribed stimulant medications **1-2** days in the past month. Only 7.3% of U of M African American female students report recreationally using this drug on a monthly basis. You use more than **93%** of African American females at the U of M.

You told us that you used non prescribed pain medication **1-2** days in the past month. Only 7.3% of U of M African American female students report recreationally using this drug on a monthly basis. You use more than **93%** of African American females at the U of M.

DRUG-RELATED CONSEQUENCES

You reported experiencing the following negative consequences in the past six months as a result of your drug use.

- Problems between you and your partner
- Problems in your family
- Neglected your family
- Problems between you and your friends
- Missed days at work or classes
- Lost a job
- Lower productivity at work or school
- Medical problems
- Withdrawal symptoms
- Blackouts or flashbacks
- Memory loss
- Difficulty sleeping
- Financial difficulties
- Legal problems
- Lower energy level
- Felt badly about your use
- Lowered self-esteem
- Procrastinated
- Lacked self-confidence
- Driving after or while using

RISKS ASSOCIATED WITH DRUG USE

- Getting Arrested =
 - Having a drug charge on your record when you apply for **jobs**.
 - Being ineligible to receive **financial aid**.
 - Being ineligible for **professional licensure** in many health, legal, and educational professions
- Medical Risks =
Marijuana:
 - Smoking marijuana makes you two to three times more likely to get **cancer of the head or neck**

- Smoking marijuana increases your chances of getting **lung cancer**; marijuana contains 50 to 70 percent more carcinogens than tobacco smoke
- Marijuana impairs judgment and coordination increasing the chances of **injuries and automobile accidents**.
- Marijuana impairs **learning, attention, and memory**.

Cocaine:

- Cocaine constricts blood vessels, dilates pupils, and **increases body temperature, heart rate, and blood pressure**
- Can cause headaches and gastrointestinal problems such as **abdominal pain and nausea**
- Can cause **irritability, restlessness, anxiety, and paranoia**
- Acute cardiovascular or cerebrovascular emergencies such as **heart attack or stroke**, which may cause sudden death
- Different methods of taking cocaine can produce **different adverse effects**:
 - Snorting
 - Loss of sense of smell
 - Nosebleeds
 - Problems with swallowing
 - Hoarseness
 - Chronic runny nose
 - Injecting
 - Can bring about severe allergic reactions
 - Increases your risk of contracting HIV and other blood-borne diseases
 - Ingesting
 - Can cause severe bowel gangrene as a result of reduced blood flow

Designer Drugs:

- Ecstasy is said to suppress the need to eat or sleep. Consequently, Ecstasy use sometimes results in **severe dehydration or exhaustion**.
- **Other immediate adverse effects** include nausea, hallucinations, chills, sweating, increases in body temperature, tremors, involuntary teeth clenching, muscle cramping, and blurred vision.
- When the effects of ecstasy have worn off, a user may feel **anxious, confused, depressed, and may have trouble sleeping**. Memory problems, 'flashbacks' and paranoia may also occur.
- An ecstasy overdose is characterized by high blood pressure, faintness, panic attacks, and, in more severe cases, loss of consciousness, seizures, and a drastic rise in body temperature. **Ecstasy overdoses can be fatal**, as they may result in heart failure or extreme heat stroke.
- Ecstasy should not be combined with other drugs. **Toxic reactions can occur if it is taken with drugs used to treat depression or HIV**.
- GHB is called the “date-rape drug” because it depresses the nervous system and can lead to a **lack of muscle control, loss of consciousness or being conscious but unable to move**.

- GHB can cause insomnia, anxiety, tremors, seizures and can possibly lead to a coma.
- These drugs are especially dangerous when combined with one another or alcohol.

Hallucinogens:

- Hallucinogens can cause psychosis, manic symptoms, depression and visual disturbances.
- Hallucinogen drug use can be accompanied by a “bad trip” in which terrifying thoughts, heightened feelings of anxiety and despair, fears of insanity and loss of control are experienced.
- Flashbacks may also be experienced by someone who has used hallucinogens in the past.

Heroin:

- Heroin can be very addictive.
- Short term side effects of heroin include depressed respiration, clouded mental functioning, nausea and vomiting, suppression of pain, and spontaneous abortion.
- Long term side effects of heroin include addiction, abscesses, collapsed veins, bacterial infections, infection of heart lining and valves, arthritis and other rheumatologic problems, and infectious diseases including HIV/AIDS and hepatitis B and C.

Sedatives or Sleep Medications (e.g., Ambien, Halcion, Restoril, Valium, Xanax):

- Sedative medications can cause drowsiness, blackouts, depressed breathing
- Sedatives impair judgment and coordination increasing the chances of injuries and automobile accidents.
- These drugs can be habit forming (e.g., tolerance develops and people use more to get the same effect).
- Sedatives should not be combined with any medication or substance that causes drowsiness, including prescription pain medicines, certain OTC cold and allergy medications, or alcohol. If combined, they can slow both the heart and respiration, which can be fatal.

Stimulants (e.g., Ritalin, Adderall) and Methamphetamine:

- Stimulants can cause irregular heartbeat, dangerously high body temperature, cardiovascular failure, and seizures.
- Used in combination with other drugs, they can cause dangerously high body temperatures, irregular heart rhythms, and possibly death.
- Meth can cause aggression, psychotic behavior, cardiac damage, impaired memory and learning

Pain Medications (e.g., Vicodin, Percocet, Lortab, Oxycontin):

- Repeated use of opioids (pain medications like OxyContin) can lead to addiction—a chronic, relapsing disease, characterized by compulsive drug

- **seeking and abuse** despite its known harmful consequences
- Opioids can produce drowsiness, cause constipation, and, depending upon the amount taken, **depress breathing**. Taking a large single dose could cause severe respiratory depression or death.
- Symptoms of **withdrawal** from opioids can include restlessness, muscle and bone pain, insomnia, diarrhea, vomiting, cold flashes with goose bumps (“cold turkey”), and involuntary leg movements.

Consuming Alcohol and Drugs Simultaneously

You reported occasionally using Marijuana in combination with alcohol. Using substances simultaneously heightens the effect of both drugs placing you at risk for severe consequences:

- **Coma**
- **Overdose**
- **Death/suicide**
- **Increased impairment**
- **Increased risk for substance related consequences**
- **Increased risky sexual behaviors**
- **Violence related consequences (arguments, hurt/injured)**

Possible Fees for a DUI

Fine (1 st Conviction)	\$350.00
Towing Fee – Car Storage	\$50.00
Bail	\$50.00
Defense Attorney	\$2,000.00
Court Costs	\$200.00
Reinstatement Fee	\$153.00
Proof of Liability insurance in effect at time of violation or pay additional	\$65.00
Additional charge if fails to surrender driver license within specified time	\$75.00
SR-22 Form (proof of insurance Required for a minimum of 3 years) Results in higher insurance rate	\$2,000.00
Driver License Examination and Driver License Fee (Class D)	\$19.50
Alcohol Education Program	\$300.00
Total	\$5,262.50

Appendix G

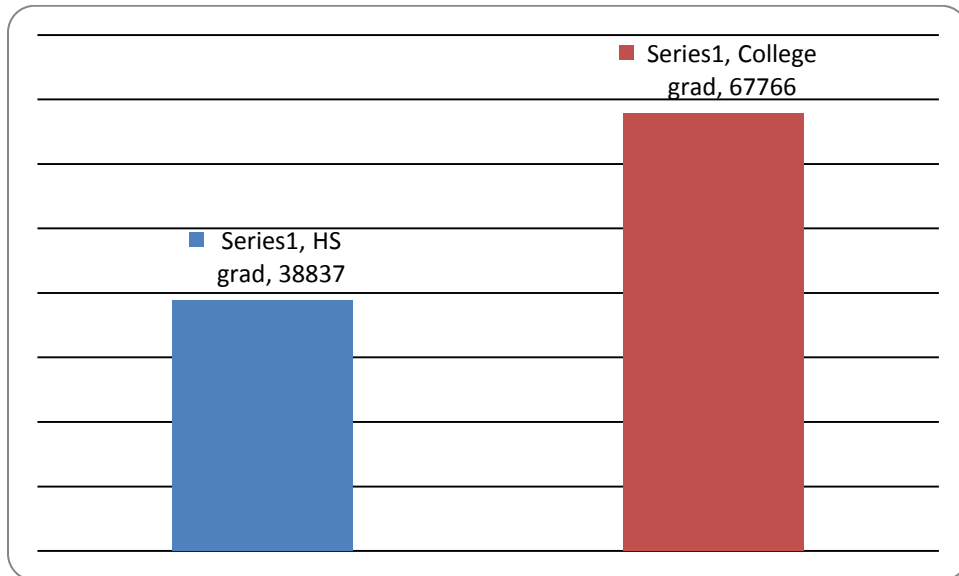
Personalized Information for Student

The goal of today's session is to help you get the most out of college. The session and this feedback are designed to help you clarify your goals, decide what sorts of activities you would like to get involved with, and decide how you would like to organize your time during college.

Graduating from College

As you have probably heard, getting through college can be very challenging. Today's discussion will give you some information and advice about how to succeed in college and make the most of your time here. Before we talk about that, we wanted to give you some facts about the percentage of freshman who actually finish college and what a college degree can mean for your income.

Average Income for High School vs. College Grads

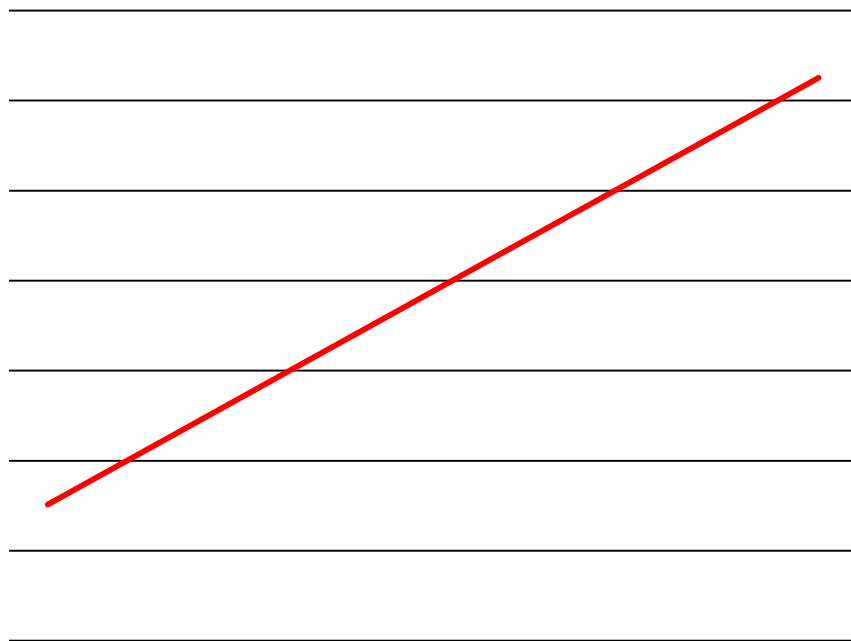


Graduation rates:

Only about half of students who start at a 4 year college actually complete their bachelor's degree.

Income differences based on GPA:

Average Annual Income as Predicted by College GPA



Your Career Goals:

You mentioned your goal was to become a nurse

Here is what it takes to become a nurse:

- 4-year college degree
- Completing a nursing school program
- Passing a national licensing examination

Getting accepted to nursing school:

Acceptance into Memphis' nursing school depends on grades and completed courses.

GPA

- The minimum GPA to apply to the University of Memphis Loewenberg School of nursing is **2.7**.
- A minimum **2.4** GPA is required for all prerequisite *science courses*

Courses

- General education courses must be completed
- Complete pre-nursing courses
- <http://nursing.memphis.edu/BsnAdmission.htm>

Extracurricular Activities

- ***Student Nurse Association*** is for nursing students with the goals of maintaining and upholding the ideals and standards of the Lowenberg School of Nursing.
- ***Phi Sigma Pi*** is an honor fraternity organization for second semester freshman with a 3.0 GPA
- ***Pi Sigma Epsilon*** is an organization for all majors that helps with resume building and job searches.

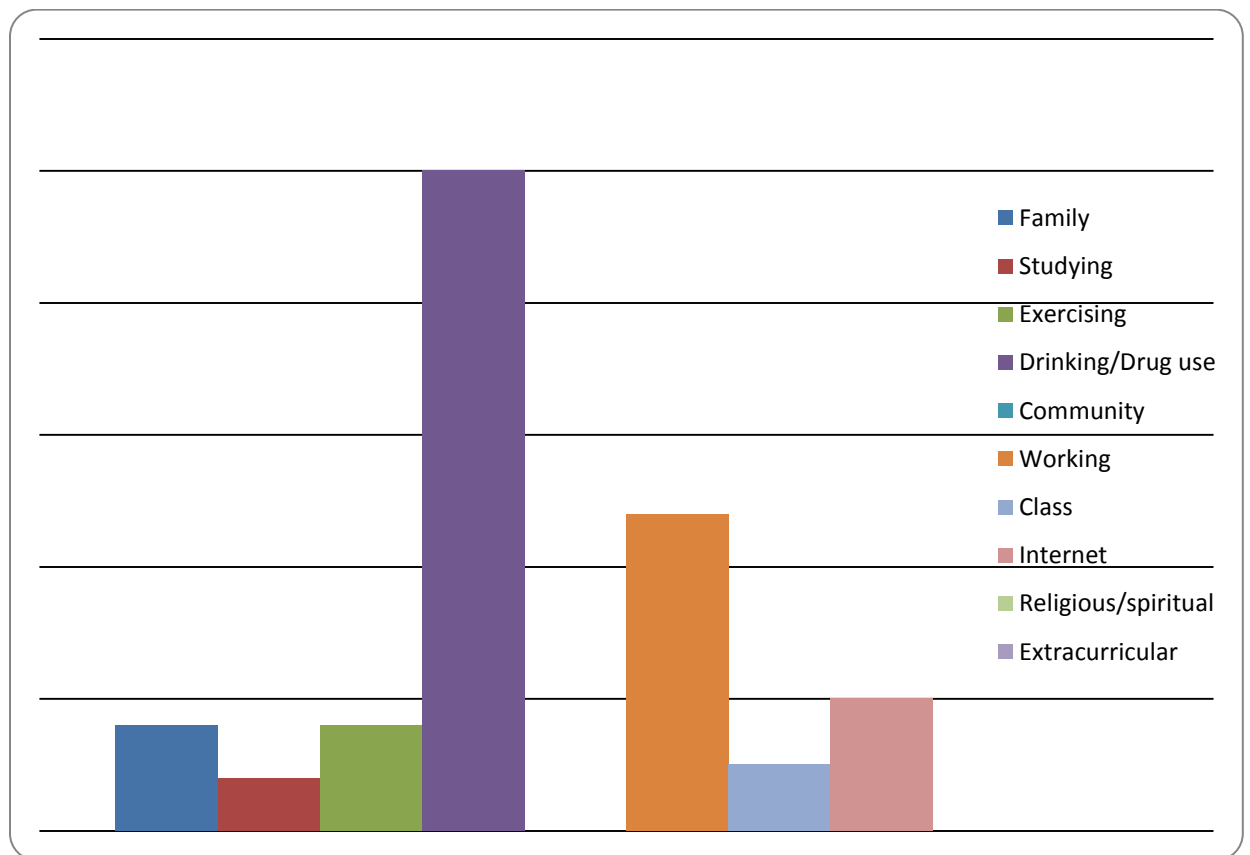
Internship

Completing an internship can increase your chances of getting into nursing school. Internship opportunities may be available by logging onto the Career and Employment Services website and searching for keywords for your desired career. (<http://memphis.erecruiting.com/er/security/login.jsp>)

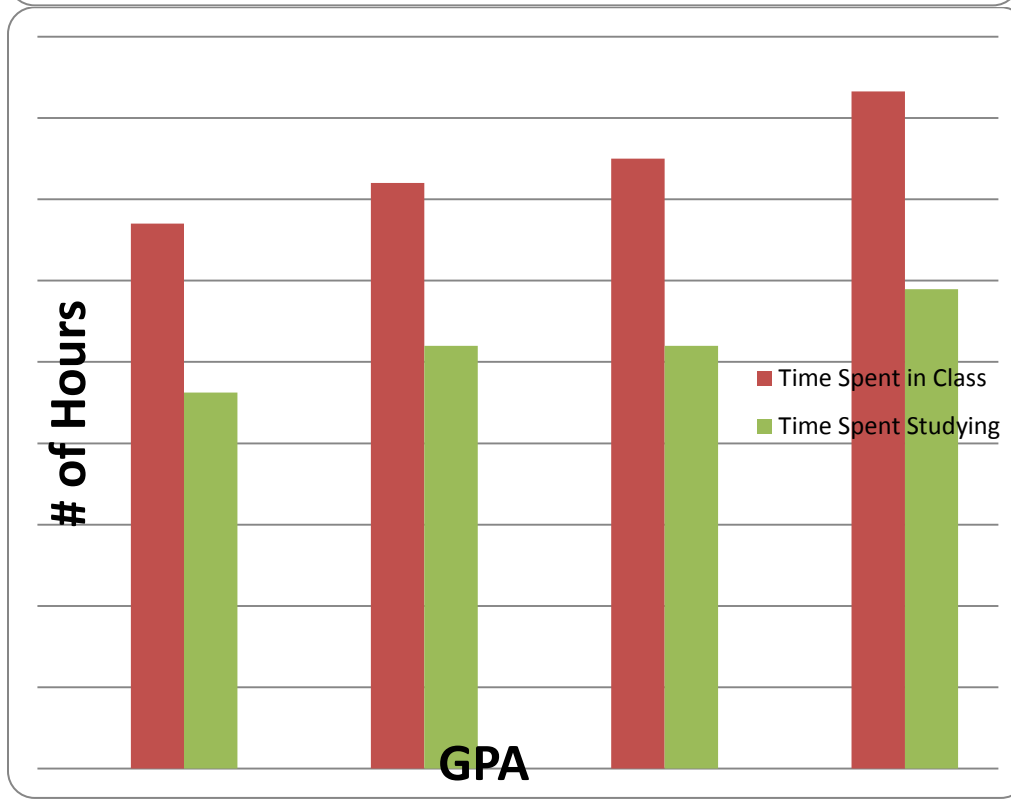
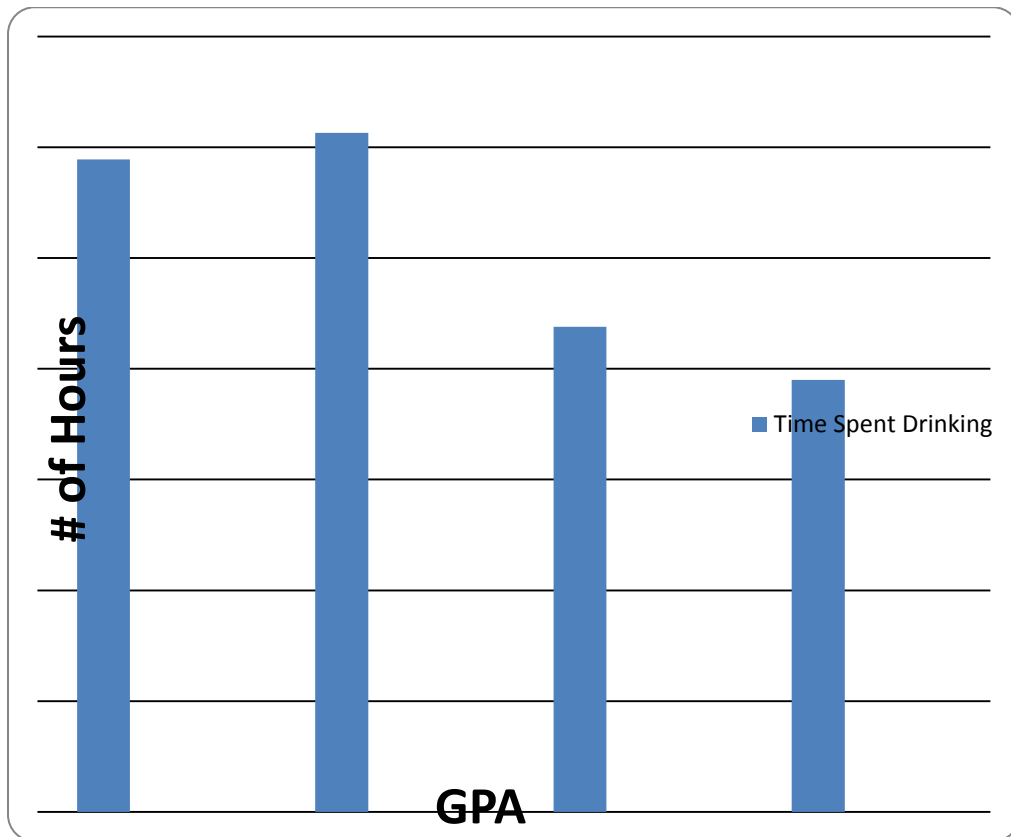
How You Spend Your Time

This is a graph showing how many hours you spend each week drinking and using drugs compared to other activities. It takes at least one hour to recover from each drink, so we added this to the estimate of time spent drinking. Although you may be asleep for much of the time you spend “recovering,” alcohol and drugs prevent deep sleep (that’s why you feel so tired the next day!).

Note how your time spent drinking/using drugs compares to other important activities.



The way you spend your time and your GPA:



Coping with Stress, Sadness, and Discrimination

College can be a very stressful time, and many college students report difficulties with their mood during college years. Some common feelings that students describe are feeling sad, “blue”, exhausted, worthless, helpless, anxious, and hopeless. Negative thinking and emotions often tend to fade as you begin to take action. Recognizing that you are feeling down, and that there are steps you can take to feel better, is an important part of learning to improve your mood.

What you said about your mood:

You told us that in the past two weeks you:

- Found it hard to wind down
- Were aware of a dryness in your mouth
- Couldn't seem to experience any positive feeling at all
- experienced breathing difficulty
- found it difficult to work up the initiative to do things
- tended to over-react to situations
- experienced trembling
- felt that you were using a lot of nervous energy
- were worried about situations in which you might panic and make a fool of yourself
- felt that you had nothing to look forward to
- found yourself getting agitated
- found it difficult to relax
- felt down-hearted and blue
- were intolerant of anything that kept you from getting on with what you were doing
- felt you were close to panic
- were unable to become enthusiastic about anything
- felt you weren't worth much as a person
- were aware of the action of your heart in the absence of physical exertion
- felt scared without any good reason
- felt that life was meaningless
- you have experienced discrimination

Some things that other college students have found helpful for coping with stress, sadness, and discrimination.

Stress and Sadness

- Engaging in activities that you find enjoyable or that will help accomplish important goals
 - Improving health and fitness by exercising or playing sports
 - Participating in a hobby
 - Spending time with people you enjoy
 - Participating in religious activities
 - Spending time outside
 - Talking to friends
 - Improving academics by joining a study group
 - Solving problems
 - Progressing towards a career by volunteering or joining an academic club
 - Getting involved in a charity or organization that you believe in
- Setting specific goals for accomplishing these behaviors
 - When, where, how often?
 - Scheduling your time and making commitments
- Keeping a regular sleep and wake schedule and making an effort to eat regular healthy meals (including breakfast)
- Avoiding excessive alcohol and caffeine
- Practicing good hygiene
- Starting the day off with a positive affirmation
- Thinking positively throughout the day
- Meditating or practicing relaxation techniques
- Exercising

Discrimination

- Report acts of racism or discrimination to the U of M Associate Dean for Student Development 901-678-2187
- Raise awareness among your institution, community and peers
 - Design a plan of action to make a positive change
 - Join a club or organization on campus (multicultural affairs)
- Seek support and advice
 - Social support from friends, family and community
 - Religious organizations
 - Join/start a support group
 - <http://www.memphisywca.org/about-us/>
- Do not avoid or ignore the event or the associated emotions
- Do not resort to violence or anger

- Avoiding excessive alcohol and caffeine
- If these strategies don't help or if you want to talk with someone about your stress or adjustment, you can call the Student Counseling Center: (901) 678-2068.

Recreational or Leisure activities:

Some activities that you report doing:

- Painting
- Volunteering
 - Community service

Other activities that you may enjoy:

- Art projects
 - Sculpting
 - Scrapbooking
- Take a yoga class
- Volunteering
 - Community service
 - Adopt a Highway