

EVALUATING THE BRIEF ALCOHOL SCREENING INTERVENTION FOR
COLLEGE STUDENTS (*BASICS*) IN SMALL GROUP SETTINGS FOR MANDATED
COLLEGE STUDENTS ENGAGED IN HIGH-RISK DRINKING

by

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DISSERTATION ABSTRACT

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Title: Evaluating the Brief Alcohol Screening for College Students (*BASICS*) in Small Group Settings for Mandated College Students Engaged in High-Risk Drinking

Utilizing a well-established manualized alcohol-focused intervention, the Brief Alcohol Screening for College Students (*BASICS*), this study explored the efficacy of implementing *BASICS* in a small group setting for mandated college students. The study assessed pretest and posttest data over a two month period to explore whether participation in the small group implementation of *BASICS* was associated with changes in substance use and related risk factors (i.e., alcohol use, marijuana use, typical blood alcohol concentration, peak blood alcohol concentration, hazardous drinking, alcohol consequences, risky sexual behavior, and depression and anxiety), pro-social change factors (i.e., harm reduction, readiness for change, and student engagement), and coping behaviors.

Repeated measures multivariate analyses of variance and covariance were conducted with a final sample of 52 participants. Multivariate analyses were examined with and without the use of covariates (baseline alcohol use and alcohol consequences scores) for substance use and related risk factors and pro-social change factors. Further exploration of substance use and related risk factors were conducted with the addition of marijuana condition. A final set of analyses explored fourteen subscales of coping behaviors.

Given limitations surrounding small and homogenous sampling, results should be interpreted with caution. The main analyses revealed no significant differences between the intervention and waitlist control group for substance use and related risk factors outcomes. This study is unable to make a definitive judgment on the effectiveness of *BASICS* implemented in small group setting for mandated students; however, findings suggest that in a small group setting *BASICS* may facilitate a reduction in engagement with substance use behaviors and associated consequences but does not promote lower risk practices. The examination of the marijuana condition revealed that participants who endorsed marijuana use demonstrated higher baseline scores for alcohol use, hazardous drinking, alcohol consequences, and risky sexual behavior. Overall, further analyses need to be conducted to determine the effectiveness of *BASICS* implemented in a small group setting for mandated students. These future research endeavors may benefit from collaborative efforts to increase sample size and implement the intervention with more diverse student populations.

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CHAPTER I

LITERATURE REVIEW

Introduction

For several decades, research efforts across disciplines have worked to understand etiology, promote prevention practices, and design effective interventions to reduce harm associated with high-risk alcohol use among emerging adults ages 18-25 (Brook, Brook, Gordon, Whiteman, & Cohen, 1990; Carey et al., 2006). Although college bound young adults boast more protective factors surrounding academics, general mental health functioning, and positive coping behaviors than their non-college bound peers, prevalence rates for drinking among college students are higher than their same age counterparts (Harford, Yi, & Hilton, 2006). The National Institute on Alcohol Abuse and Alcoholism (NIAAA) Task Force on College Student Drinking (2002) reported that first year resident students frequently misuse alcohol and experience negative consequences associated with drinking behaviors (Saltz, 2004/2005). In addition, over 80% of college students report drinking alcohol and about 40% report a heavy drinking episode within any 2-week timeframe (Merline, O'Malley, Schulenberg, Bachman, & Johnston, 2004; O'Malley & Johnston, 2002; Wechsler, Davenport, Dowdall, Moeykens, & Castillo, 1994). The combined effects of alcohol use prevalence rates and college drinking statistics make college campuses an ideal setting to address high-risk drinking among emerging adults.

Heavy episodic drinking, commonly referred to as binge drinking, is defined as consuming more than 4 or 5 standard drinks in a row (respectively for females and males) with the intentions of getting drunk (Wechsler et al., 1994). Extant literature has documented the harmful consequences of binge drinking that affects both individuals and

their communities including academic problems, sexual assault, vandalism, physical injury and death (Wechsler et al., 2002; Hingson, Edwards, Heeren, & Rosenbloom, 2009). For example, in 1998 and 2001, more than 500,000 students were injured because of drinking, over 600,000 were assaulted by a fellow student who had been drinking, and more than 1,700 students died each year from injuries related to alcohol use (Hingson, Heeren, Winter, & Wechsler, 2005). The application of harm reduction efforts to reduce consequences associated with high risk drinking is critical in promoting safety for students, their peers, and the communities in which they reside.

The prevalence of high-risk drinking on college campuses has led to increased enforcement of alcohol policies (Barnett & Read, 2005). This, in turn, has created a steady increase in the number of mandated students, defined as students referred to campus administration for violating campus alcohol policies (Tevyaw, Borsari, Colby, & Monti, 2007). Colleges and universities have developed programmatic responses to intervene with students who violate alcohol and other drug use policies on campus (Barnett & Read, 2005). Forms of prevention and intervention efforts commonly include some form of mandatory alcohol education or counseling process such as online alcohol education programs, computer-based personalized feedback interventions, (e.g.: Electronic Check Up to Go (e-CHUG); Walters, Vader, and Harris, 2007), brief motivational interventions (e.g.: Brief Alcohol Screening and Intervention program for College Students (*BASICS*; Dimeff, Baer, Kivlahan, & Marlatt, 1999), and group motivational enhancement therapy. Targeted interventions for students who violate university alcohol policies may be an appropriate avenue to increase knowledge about the

effects of alcohol, reduce high risk drinking behaviors, and promote long-term behavior changes among at-risk college students.

The purpose of this study is to explore the efficacy of alcohol-focused interventions for mandated college students on reducing high-risk drinking patterns. In the following sections, I review the literature on alcohol-focused interventions designed specifically for emerging adults. Subsequently, I describe the proposed plan for the study, including research questions, procedures, and measures. Finally, I outline the proposed analyses that I will use to explore future data collected.

High Risk Drinking and Alcohol-Related Consequences

College students who engage in high risk drinking behaviors report experiencing a range of alcohol-related consequences that affects physical health, academic functioning, personal safety, and the communities in which students reside (Wechsler et al., 2002; Hingson et al., 2009). The Harvard School of Public Health College Alcohol Study (CAS) began in 1992, conducted four national surveys, and produced more than 80 publications over the course of the 14 year project on student related drinking behaviors and outcomes. Early reports on college student drinking behaviors released in the CAS (Wechsler et al., 1994). originated the 5/4 “binge” drinking threshold, and defined binge drinking as a pattern of alcohol consumption characterized by 5 or more drinks in a row for males (and 4 or more drinks in a row for females) in the past two weeks. The 5/4 binge drinking threshold also coincides with an average blood alcohol concentration around 0.08 gram percent, also widely considered the “legal limit”. Statistically, students who meet or exceed the binge drinking threshold are at greater risk of experiencing

negative alcohol-related consequences than non-binge drinkers (Wechsler & Nelson, 2001).

In their research on college student drinking behaviors, White, Kraus, and Swartzwelder (2006) found that many college freshman drink as levels far beyond the 5/4 binge threshold. Authors examined self-report data from over 10,000 first-semester freshmen at 14 schools across the U.S. Results showed that approximately 55% of all students drank alcohol in the past two weeks before the survey. In addition, over 41% of males and 34% of females met or exceeded the threshold for binge drinking at least once in the previous two weeks. Data analyses revealed that approximately 1 of 5 males (19.9%) consumed 10+ drinks, twice the binge threshold, at least once during the previous two weeks. Approximately 8% of female binge drinkers consumed 8+ drinks at least once during the previous two weeks. Analyses also demonstrated a prevalence of a smaller sub-set of drinkers who consumed around three times the binge threshold (7.6% males and 1.8% females). The authors suggest that there are clear differences in the drinking habits of frequent and infrequent binge drinkers, beyond how often they meet or exceed the 5/4 binge threshold. Data collected on drinking behaviors often explores domains of drinking quantity and frequency as indicators of risk-factors associated with use. Frequent binge drinkers are more likely than infrequent binge drinkers (1 or 2 binge episodes in a 2-week period) to experience a range of alcohol related consequences (Wechsler et al., 2002). White and colleagues (2006) suggest that that frequent binge drinkers not only binge drink more often, but are more likely than infrequent binge drinkers to drink at peak levels at or above 2 and 3 times the binge threshold. Given the prevalence rates and associated risks of binge drinking, examining high risk drinking

behaviors among college students will provide opportunities to further educate and positively impact students.

Results from the College Alcohol Study (CAS) findings have also explored the relationship between alcohol consumption at binge levels and alcohol-related consequences surrounding academic performance, social relationships, risk-taking behaviors, and health. Singleton and Wolfson explored alcohol use levels and the relationship to study habits among college students (2009). The authors found that students who reported binge drinking episodes demonstrated academic-related consequences such as missing class, falling behind in school work, and lower grade point averages, mediated by fewer hours spent studying. The presence of alcohol use is associated with at least 50% of sexual assaults on female college students (Abbey, Zawacki, Buck, Clinton, & McAuslan, 2001). In another study exploring CAS data on prevalence rates of rape under the condition of intoxication, Mohler-Kuo and colleagues reported that roughly one in twenty (4.7%) women reported being raped (2004). In addition, approximately 72% of the victims experienced rape while intoxicated. In addition, there are also secondhand effects of alcohol that impact individuals in contact with the primary drinker and the community at large. Hingson and colleagues examined the number of college students who experienced alcohol-related deaths, injuries and other health problems (2002). Results indicated that in 1998 over 1,400 students died from alcohol-related unintentional injuries, including motor vehicle crashes. In addition, over 500,000 full-time 4-year college students were unintentionally injured while under the influence of alcohol and over 600,000 were hit or assaulted by another student who had been drinking.

Problematic drinking among college students is often thought to be transitory and a reflection of merely short-term physical consequences rather than long-term alcohol dependence. Perkins (2002) reviewed research on consequences of alcohol misuse in college populations and found significant and consistent decreases across college to post-college transitions on alcohol-related consequences. However, research on short-term and long-term effects of binge drinking also indicates that binge drinking patterns exhibited during the college years posed significant risk factors for alcohol dependence and abuse 10 years after the initial interview (Jennison, 2004). Although many students demonstrate a reduction in alcohol-related consequences over the course of their college careers and beyond, drinking patterns and behaviors acquired during college can greatly impact the developmental trajectory of alcohol-related clinical diagnoses.

Alcohol Related Diagnostic Criteria

The *Diagnostic and Statistical Manual of Mental Disorders* (fourth edition, text revision [DSM-IV-TR]; American Psychiatric Association, 2000) defines alcohol abuse as a maladaptive pattern of drinking behaviors manifested by recurrent and significant adverse consequences related to the repeated use of alcohol within a 12-month period. An individual would receive a diagnosis of alcohol abuse if they met any one of the four established criterion. The first criterion for alcohol abuse identifies recurrent use resulting in a failure to fulfill major role obligations at work, school, or home. Secondly, an individual would meet criteria if they engaged in recurrent use in situations in which it is physically hazardous, for example driving a vehicle while impaired. The third criterion acknowledged recurrent alcohol-related legal problems. The final criterion indicates continued alcohol use despite having persistent or recurrent social or interpersonal

problems caused or exacerbated by the effects of the substance. Alcohol dependency is defined by meeting the criteria for alcohol abuse in addition to meeting criteria three of the seven indicators surrounding substance dependence (DSM-IV-TR, 2000).

Knight and colleagues explored prevalence of alcohol abuse and dependence among U.S. college students (2002). The authors examined self-report responses for more than 14,000 students across 119 4-year colleges. Results demonstrated that 31 % of students endorsed criteria for an alcohol abuse diagnosis and 6% for a dependence diagnosis in the past 12 months. When examining students who meet criteria for frequent binge drinking (5/4+ drinks per occasion; 3 or more binge drinking episodes per in past 2 weeks), 3 in 5 meet criteria for alcohol abuse and 1 in 5 qualify for alcohol dependence. Neither tolerance nor withdrawal is necessary or sufficient for a diagnosis of alcohol or substance dependence. However, a past history of tolerance or withdrawal is a risk factor associated with a more severe clinical trajectory. Although the majority of college students do not meet criteria for an alcohol-related diagnosis, it is important to acknowledge that these students may still experience harmful consequences associated with their drinking behaviors. In addition, prevention and intervention efforts are needed to address students who do demonstrate frequent binge drinking behaviors and meet criteria for alcohol abuse and/or dependency.

Mandated Students

Underage student alcohol use on college campuses continues to be a primary policy violation experienced at universities across the nation. Analyses of yearly college alcohol surveys indicate that more than half of all reported university violations of campus policies involve alcohol (Barnett, O'Leary, Fromme, Borsari, Carey, Corbin, et

al., 2004). As a result, many colleges have instituted mandatory sanctions for alcohol violations that often require students to attend alcohol education classes or alcohol counseling. Extant literature demonstrates that students who are cited for an alcohol-related violation report higher-risk drinking behaviors than their non-adjudicated peers (Caldwell, 2002). University educators and interventionists have employed different methods to address high-risk drinking for mandated students (e.g., motivational enhancement, psycho-education, and computerized interventions), and research supports the effectiveness of various types of interventions. Several studies support the efficacy of alcohol-interventions for mandated students (Bosari & Carey, 2000; Barnett & Read, 2005) and the greater efficacy of utilizing brief motivational interventions over alcohol-education only interventions (Bosari & Carey, 2005). Efforts are still in progress to explore personal, contextual, and intervention characteristics that may work in conjunction to promote change associated with high-risk drinking.

White and colleagues (2008) attempted to isolate the impact of receiving a sanction on mandated students' drinking behaviors. The authors evaluated a personalized feedback intervention and provided immediate feedback versus delayed feedback for intervention groups. Results indicated that students in both conditions generally reduced their drinking at 2-month and 7-month follow-ups. However, they found no significant between-group differences at either follow-up, suggesting that the incident and/or reprimand are an important catalyst for change. The knowledge that a violation alone can promote change behaviors does not absolve universities and change-agents of the responsibility to address problem drinking on campuses. As such, continued efforts are

needed to identify the multi-systemic and ecological factors that influence motivations to change problem drinking behaviors.

Harm Reduction

Harm reduction is an umbrella term for a range of interventions aimed at reducing harmful consequences and problematic effects of behaviors (Marlatt, 1998; Denning, 2000). A common example of a harm reduction approach is the promotion of needle exchange programs to reduce the risk of HIV transmission for IV-drug users. Harm reduction often infuses principles of motivational interviewing, a client-centered and nonjudgmental approach to explore ambivalence surrounding the change process (MI; Miller & Rollnick, 2002). Motivational interviewing is a highly regarded communication style that is widely used in substance use treatment and health care setting. Additionally, it is important to have a perspective of the theory of change. The transtheoretical model of change views change as a process of evolving progress through a series of stages (Prochaska, DiClemente, & Norcross, 1992). An integration of these three components can be utilized to understand, approach, and promote effective alcohol-related interventions for emerging adults.

Harm reduction is a lens often used to understand and treat substance use disorders. Pat Denning identified several principles of harm reduction psychotherapy that include ways for practitioners to approach substance abuse from a more ecological perspective (2000). A primary principle addresses the practitioner's ethical responsibility of non-maleficence (i.e. first, do no harm). In addition, Denning (2000) promotes an understanding of addiction from a biopsychosocial framework, attention to the adaptive reasons for an individuals' use, and tailoring treatment approaches and interventions to

meet a client's stage of change. A final set of principles acknowledge that substance use does not always lead to chemical dependency, that abstinence is not necessary to participate in treatment, and that any reduction in substance-related harm is a positive step. With regards to risky drinking practices among college students, a harm reduction approach may encourage safer drinking practices to reduce the risk of alcohol poisoning without the pressure of complete abstinence that could be met with resistance.

Using a harm reduction lens to understand and treat substance use disorders also requires the incorporation of motivational interviewing techniques, which promote autonomy, collaboration, and evocation while utilizing a nonjudgmental approach to support client concerns (MI; Miller & Rollnick, 2002). Miller & Rollnick define motivational interviewing as a client-centered, directive method for enhancing intrinsic motivation to change by exploring and resolving ambivalence (2002). Motivational interviewing focuses on the concerns and perspectives of the individual, and fundamentally is a style of communication that evokes change talk. Five general principles underlie the motivational interviewing approach including expressing empathy, developing discrepancy, rolling with resistance, avoiding argumentation, and supporting self-efficacy (Miller & Rollnick, 2002). The primary goals of motivational interviewing are to establish rapport, elicit change talk, and establish commitment language from the client. In addition, four counselor methods have been identified to explore ambivalence and clarify reasons for change including utilizing open-ended questions, reflective listening, positive affirmations, and incorporating summarizing statements.

Many therapeutic approaches espouse a concept of meeting client's where they are at. This requires clinicians to maintain a firm understanding of theory of change. The

transtheoretical model of behavior change assesses an individual's stage of change and readiness to engage in the change process (Prochaska et al., 1992). The model identifies six stages of change including precontemplation, contemplation, preparation, action, maintenance, and termination. The lack of intention to change, or precontemplation, is ironically considered the first stage of change. Individuals who are precontemplative are often unaware or underaware of problems associated with their substance use behavior, and they demonstrate no significant intention of making positive changes in the near future. Contemplation is the stage in which clients are aware of that a problem exists and they may utilize decisional balance activities to explore their ambivalence, however they have not made a commitment to take action. The combination of intention and behavioral criteria would place an individual in the preparation stage of change. For example, clients may take steps to eliminate alcohol or drug related possessions that could inhibit their ability to successfully make changes. During the action stage, individuals modify their behavior and exercise harm reduction or positive coping strategies effectively. Maintenance is a stage in which people work to prevent relapse and consolidate the gains attained during action (e.g.: participating in weekly support meeting). Often, individuals cycle through the stages of change several times before reaching termination.

When approaching the subject of substance abuse with emerging adults it is helpful to integrate these three perspectives. College students are often in a transitional developmental stage in which they are exploring independence and developing ways to live autonomously from parental and other authority figures. In addition, it is important to acknowledge the social and environmental contexts in which students live that may promote high risk-drinking practices. Utilizing a nonjudgmental harm reduction

approach, while meeting students where they are at in the change process, will potentially reduce students' resistance to change. Additionally, progress towards reducing harmful drinking practices rather than promoting abstinence-only approaches may result in more sustained behavior changes.

Brief Motivational Interventions

Brief interventions are delivered using motivational interviewing, a client-centered method designed to increase intrinsic motivation to change by exploring, highlighting, and helping clients resolve ambivalence about change (Miller & Rollnick, 2002). Through a series of independent studies, The National Institute on Alcohol Abuse and Alcoholism (NIAAA, 2002) designated Brief Alcohol Screening and Intervention for College Students (*BASICS*) as an approved and efficacious Tier 1 intervention. Brief Alcohol Screening and Intervention for College Students (*BASICS*; Dimeff et al., 1999) is a manualized intervention that is widely adapted and utilized throughout colleges and universities. The intervention design of *BASICS* is a one-on-one personalized feedback session between a student and trained clinical professional, where the student's drinking behaviors are explored using principles of motivational interviewing. Personalized feedback is designed to engage students and heighten the self-relevance of the educational information. Such feedback, when coupled with normative comparisons, develops a sense of discrepancy that can motivate risk reduction. Many brief motivational interventions (BMIs) have adapted the principles of *BASICS* and address discrepancies and misconceptions about peer attitudes towards drinking, challenge attitudes and beliefs surrounding social and physical contexts of alcohol related expectancies, and increase

students' motivation to change their drinking habits (Carey, Scott-Sheldon, Carey, & DeMartini, 2007).

The *BASICS* self-report questionnaire is a multi-dimensional assessment that contains empirically validated measures to assess risk and protective factors of student drinking behaviors. The first section covers demographic questions, college goals, and frequency of alcohol and other drug use. In addition, participants complete a “two week drink calendar” in which they are asked to document the number of standard drinks they consumed per day, the number of hours they spent drinking, report occasions of marijuana use as well, and the estimated amount of money spent on marijuana. Next, students are asked to report their heaviest drinking occasion in the past month, complete alcohol and marijuana expectancies questionnaires, and identify alcohol related consequences experienced in the past month. If students also endorse using marijuana, they are required to provide additional information regarding history, frequency, and consequences related to their marijuana use. The remaining items explore family history of alcohol and drug-related problems, protective behaviors students may practice while drinking, and evaluation of importance and confidence of ability to change substance use behaviors. This information is compiled into the personalized feedback report which provides an individualized compilation of reported substance use behaviors, information about blood alcohol concentration, information about the physical effects of alcohol on the body including BAC (blood alcohol concentration), the elimination of alcohol from the body, information about alcohol poisoning, risk factors of use behaviors, and readiness to change.

Terlecki and colleagues (2010) evaluated a brief motivational intervention (BMI) for reducing risky alcohol use and alcohol-related problems among mandated and voluntary student drinkers. Participants were randomly assigned to treatment or assessment-only control conditions. The intervention was conducted following the Brief Alcohol Screening and Intervention for College Students (*BASICS*) manual. Mandated students were assigned to a brief wait list. Results showed that participants assigned to treatment reported consuming fewer drinks after the intervention relative to control groups. In addition, mandated students reported significantly fewer alcohol related problems (e.g. lower peak blood alcohol concentration and fewer drinks per episode) at the follow-up assessment relative to volunteers. This study demonstrates the effectiveness of brief motivational interventions and that they are increasingly beneficial for mandated students at reducing alcohol use and alcohol-related problems in college students (Terlecki et al., 2010).

In another study, Carey and colleagues (2006) conducted a randomized control trial to evaluate the effectiveness of brief motivational interventions (BMIs) among at-risk college drinkers. The study sought to determine whether enhanced assessment measures and decision balance exercise components provided useful additions or whether a more streamlined basic BMI is sufficient. Eligible participants reported at least one episode of heavy drinking in an average week or four heavy drinking episodes in the last month (i.e., four/five standard drinks for women/men). Students were randomized to six conditions and participated in one, six, and twelve month follow-ups. Results demonstrated that a pre-intervention assessment of daily drinking reduced both typical and risky alcohol consumption. The authors also found that individually administered

BMI groups showed reductions in drinking. Both groups showed significant reductions in alcohol consumption over time and were equivalent by twelve months. However, the BMI groups produced reductions more quickly and then stabilized over the year. Finally, this study found that the decision balance exercise was not effective, postulating that it may not adequately develop sufficient discrepancy to motivate behavior change. Overall, this study demonstrated that the basic BMI is an effective intervention for both short- and long-term risk reductions, and supplementing it with an extended assessment measure is likely to enhance risk reductions in the short-term (Carey, Carey, Maisto, & Henson, 2006).

Brief motivational interventions can also be administered in a single session format, which may reduce costs associated with delivering evidence-based interventions. In one study, Borsari and Carey (2000) conducted a randomized control trial of a 1-session motivational intervention for college student binge drinkers. Participants were randomly assigned to either a no-treatment control or a brief intervention group. The intervention was adapted from the Brief Alcohol Screening and Intervention for College Students (*BASICS*; Dimeff et al., 1999). It consisted of a face-to-face single session intervention between the student and facilitator and provided feedback regarding personal consumption, perceived drinking norms, alcohol-related problems, situations associated with heavy drinking, and alcohol expectancies. Primary outcome measures included number of drinks consumed per week, number of times consuming alcohol in the past month, frequency of binge drinking in the past month, and scores from the Rutgers Alcohol Problem Index (RAPI; White & Labouvie, 1989). At six-week follow-up, the brief intervention group exhibited significant reductions on number of drinks consumed

per week, number of times drinking alcohol in the past month, and frequency of binge drinking in the past month compared to control (Borsari & Carey, 2000).

Brief motivational interventions have also been proven to have a long-term impact on the reduction of high-risk drinking in college populations. White and colleagues (2007) compared the long-term efficacy of 2 brief substance-use feedback interventions for mandated college students. This follow-up study examined mandated students who were randomly assigned to either a brief motivational interview (BMI) or written feedback-only intervention (WF) at four months and fifteen months post-intervention. Students in the BMI intervention showed significantly lower levels of alcohol-related problems at fifteen months than those in the WF intervention. In addition, the BMI intervention more effectively reduced within-individual alcohol-related problems during the initial four months, and more successfully curbed the subsequent increase in alcohol use frequency and number of drinks per week. Although the short-term positive effects of the interventions dissipated over time, in peak blood alcohol concentration (BAC) levels, number of drinks per week, and the number of alcohol-related problems showed a collective reduction over time, particularly in the BMI group. Overall, results suggest that brief substance use interventions reduce the riskiest type of alcohol use among mandated college students over the long term (White, Mun, Pugh, & Morgan, 2007).

In summary, adapting brief motivational interventions to target at-risk students is an effective way to reduce high-risk drinking over time. Extant literature has demonstrated that BMIs are most effective in a one-on-one format where principles of motivational interviewing are incorporated to explore ways to implement harm reduction

practices to reduce high risk drinking (Carey, Scott-Sheldon, Carey, & DeMartini, 2007). Brief Motivational Interventions (BMIs) have been shown to be effective at reducing alcohol use and alcohol-related problems among voluntary heavy drinking college students for follow-up periods between 6 weeks and 2 years (Borsari & Carey, 2000; Carey et al., 2006). Brief Motivational Interventions for mandated students show emerging efficacy for reducing risky alcohol use and associated negative consequences in this higher risk population (Terlecki et al., 2010). The implementation of BMIs in University settings have demonstrated effectiveness over time, which suggests that they can also positively intervene in the developmental trajectory of alcoholism and associated ecological risks. Overall, universities may be the right place and college may be the right time to address risky drinking practices.

Group Motivational Enhancement Therapy

Where brief motivational interventions take place in a one-on-one setting, group-motivational enhancement therapy is another format to deliver alcohol-related interventions. Group motivational enhancement therapy (GMET) includes motivational interviewing components such as rolling with clients' resistance, supporting clients' self-efficacy, developing discrepancy between clients' current behaviors with short- and long-term goals, and expressing empathy (LaChance, Feldstein Ewing, Bryan, & Hutchison, & 2009). Group motivational interventions can serve as an opportunity for students to discuss their alcohol related experiences openly, gain perspectives about their drinking practices, and hear harm reduction strategies endorsed by their fellow peers. In addition, they challenge misconceptions about drinking norms, explore information about alcohol and its physiological effects, and encourage students to identify strategies to reduce

alcohol-related risks. GMETs can be cost-effective ways to promote harm reduction around alcohol use in college populations.

Research on GMETs demonstrates effectiveness in comparison and in addition to more traditional forms of alcohol interventions. In a study conducted by LaChance and colleagues (2009), authors examined the effectiveness of group motivational enhancement therapy (GMET) compared to a standard mandated alcohol intervention program (FAC) and an alcohol information only condition (AI) among college students at a national university. All students were referred for an alcohol related offense and were randomly assigned to one of the three conditions. Several potential mediators contributing to drinking behaviors were examined including readiness to change, self-efficacy, perceived risk, normative estimates of peer drinking behaviors, and positive drinking expectancies. Outcome variables of interest included average drinks per drinking day, hazardous drinking, and alcohol-related problems. Results determined that the GMET intervention was superior to both alcohol education groups and that students randomly assigned to GMET demonstrated significantly lower problem drinking outcomes (at both 3-month and 6-month follow-ups). In addition, authors found that self-efficacy emerged as a significant mediator and proposed that future research may benefit from determining ways to enhance self-efficacy to reduce risky drinking behaviors (LaChance et al., 2009).

LaBrie and colleagues implemented a campus-based motivational enhancement group intervention to reduce problematic drinking (2007). Authors conducted a single-session group intervention examining the effects of a group motivational enhancement intervention with freshman male undergraduate students. The intervention employed the

empathetic, non-confrontational style of motivational interviewing and combined three key components of motivating behavior change: (a) presented participants with normative feedback to counter misperceptions of normative drinking behavior; (b) provided participants with information regarding alcohol expectancies and how they can influence behavior; and (c) built motivation to change through MI techniques. Results demonstrated that all participants drank less following the intervention, and students classified as frequent binge drinkers significantly reduced drinking behavior from pre-intervention through 3 months of follow-up. Freshman males who did not receive the intervention were more than twice as likely to receive alcohol related citations as participants in the intervention group. Overall, authors found that the intervention appeared most effective with frequent binge drinkers (LaBrie, Pedersen, Lamb, & Quinlan, 2007).

Evidence supports the effectiveness of interventions that use survey data to counter students' misconceptions about their fellow students' attitudes towards excessive drinking, concurrently address alcohol-related attitudes and behaviors, and increase students' motivation to change their drinking habits (Larimer & Cronce, 2002). However, few studies have examined how to adapt the principles of motivational interviewing to a group setting. Additionally, group interventions that foster increased autonomous motivation predict greater individual change and may be a cost effective way to help reduce problematic drinking for many individuals at once. As such, adapting a group motivational enhancement intervention for mandated students who have violated campus alcohol policies could increase student's knowledge about alcohol and its harmful effects while promoting lower-risk drinking.

Student Engagement

Student engagement in various aspects of University life can greatly impact both risk and protective factors. This study will be conducted at the University of Oregon, a Pac-12 school which boasts both high-profile athletics and rigorous academic programs. In current literature, student engagement is a multi-dimensional construct defined through four subtypes including academic, cognitive, behavioral, and psychological. Academic engagement consists of variables such as credits earned toward graduation and homework completion. Cognitive engagement reflects students' application of self-regulation, learning goals, and investment in learning. Behavioral engagement encompasses positive conduct, effort, and participation. Finally, psychological aspects of engagement describe students' feelings of identification or belonging, and relationships with teachers and peers (Appleton & Christenson, 2004).

Porter and Pryor examined the effects of heavy episodic alcohol use on student engagement, academic performance, and time use among college students. The authors found that students who reported drinking heavily tended to have lower GPAs, were less engaged academically, tended to have lower student-faculty interaction, and spent less time on academics. These findings are consistent with similar results in extant literature and demonstrate the negative impact that heavy drinking has on overall academic functioning (2007).

Summary

It is clear from the literature that there are harmful effects of high risk drinking behaviors among emerging adults, specifically college students. In addition, the extant literature demonstrates that utilizing brief motivational interventions are an efficacious

way to reduce risks and protect against consequences associated with high risk drinking. Conducting such interventions in a group format which utilizes group motivational enhancement strategies can be a cost effective way to administer alcohol-prevention interventions to a greater student population. Researchers have identified intervention components including motivational interviewing principles, providing personalized feedback on use behaviors and risk factors, and discussing information regarding alcohol expectancies as common factors associated with evidence-based alcohol interventions. Most importantly, research suggests that as prevalence rates continue to rise, so do the myriad risk factors associated with high-risk drinking which affect individuals and communities. Therefore, this study examined the effectiveness of administering the *BASICS* intervention in a small group format among mandated university students.

Purpose of Study

The purpose of this present study was to evaluate the effectiveness of *BASICS*, an alcohol based intervention, implemented in a small group setting at the University of Oregon. This study aimed to examine the efficacy of administering a brief-motivational alcohol intervention in a group format for mandated university students. The primary goals of this study were to: (1) examine the effectiveness of the *BASICS* program on reducing substance use and related risk factors including alcohol use, marijuana use, typical blood alcohol concentration, peak blood alcohol concentration, hazardous drinking, consequences related to alcohol use, risky sexual behaviors, and depression and anxiety; and (2) examine the effectiveness of the *BASICS* program on increasing pro-social change factors through the use of readiness to change, harm reduction strategies, student engagement, and coping behaviors.

Research Questions

Research Question 1: Is there a reduction in substance use and related risk factors (e.g., alcohol use, marijuana use, hazardous drinking behaviors, alcohol-related consequences, risky sexual behaviors, and depression and anxiety) following participation in *BASICS compared to the waitlist-control group*?

Research Question 2: Is there an increase in pro-social change factors (e.g., readiness for change, use of harm reduction strategies, student engagement, and coping behaviors) following participation in *BASICS compared to the waitlist-control group*?

Statistical Hypotheses

The following section discusses hypothesized statistical relationships among observed variables. All variables should be inter-correlated across the time points. Reductions in alcohol use, marijuana use, typical blood alcohol concentration, peak blood alcohol concentration, hazardous drinking, alcohol related consequences, risky sexual behaviors, and depression and anxiety were predicted to be demonstrated over time, with greater reductions shown in the intervention group compared to waitlist-control group. Increased endorsement of harm reduction behaviors, improved coping strategies, readiness for change, and student engagement were predicted to be demonstrated over time, with greater improvements shown in the treatment group compared to the waitlist-control group. Differences in observed variables across ethnicity and class status were not predicted (given homogeneity of sample demographics).

In summary, the current study aimed to examine the effectiveness of the *BASICS* program on reducing substance use and related risk factors and its effectiveness on increasing pro-social change factors among a sample of mandated university students. As

of yet, there are no published studies that examine the effectiveness of *BASICS* in small group settings, particularly because it was designed to be implemented in a one-on-one format; however, this study will add to a growing body of literature by conducting the *BASICS* intervention in small group sessions as a way to maximize university resources while promoting efficacious aspects of group motivational enhancement therapy.

Additional information on the efficacy of alcohol-related interventions with college students can support efforts aimed at reducing the harmful effects of high-risk drinking with this susceptible population. Through the exploration of proposed outcome variables, we may be able to identify additional domains to focus future prevention and intervention efforts that can promote safety and positively impact the developmental trajectory for emerging adults as they transition from college into the working world.

CHAPTER II

METHODS

The present study examined a sample of college students from the University of Oregon. The project utilized a repeated measure, randomized waitlist-control group, experimental design. The primary purpose of the study was to explore substance use, related risk factors, and pro-social change factors associated with mandated participation in an alcohol-related intervention. With the support of the University Counseling and Testing Center (UCTC) and the Office of Student Conduct and Community Standards, *BASICS* was conducted at the UCTC under the supervision of licensed professionals and implemented by trained interventionists. Prior to the onset of the study, a power analyses was conducted using the statistical software G-Power 3 (Erdfelder, Lang, & Buchner, 2007) to determine the necessary sample size needed to detect proposed effects. Two-tailed G-Power analyses with a preset statistical significance a 0.05 indicate an optimal sample size of 100 participants per group, or a total sample size of 200 participants. Following data collection, preliminary data analyses were examined to determine if all necessary assumptions were met including normal distribution of dependent variables, homogeneity of variances, independent observations, and linearity (Grimm & Yarnold, 1995). Repeated measures multivariate analyses of variance (MANOVA) was the primary statistical test used to examine the strength of relationships between the dependent variables and independent variables.

The categorical independent variables refer to the intervention group and the waitlist-control group. Descriptive statistics were examined to determine if there were any significant between group differences on demographic characteristics or initial

drinking characteristics that might interfere will a more accurate interpretation of the results. The dependent variables of interest included: (1) alcohol use; (2) marijuana use; (3) typical blood alcohol concentration; (4) peak blood alcohol concentration;(5) hazardous drinking behaviors; (6) alcohol-related consequences; (7) risky sexual behaviors; (8) readiness for change; (9) harm-reduction strategies; (10) student engagement; (11) depression and anxiety; and (12) coping behaviors. To determine whether differences exist between treatment and waitlist-control groups on the observed dependent variables, MANOVA omnibus F-tests were calculated. Further analyses were conducted to identify potential main effects and simple effects. All analyses utilized the Bronferroni Procedure to account for type 1 error. Statistical analyses were conducted using the Statistical Package for the Social Sciences, GradPak v.20 (SPSS, 2011). Statistical significance was interpreted based on predetermined alpha-levels grounded in extant literature.

Research Design

This study was implemented using a randomized repeated measures waitlist-control design (please see table 1 below). At the point of sanction, students self-selected to participate in the study and were randomly assigned to either treatment or waitlist-control groups through a computer-based randomization program. Participants assigned to the treatment group completed the abbreviated measure prior to receiving the *BASICS* intervention, and completed follow-up measures at two additional time points –two weeks and four weeks. The waitlist control group completed the abbreviated measure at two time points across regular 2-week intervals, prior to their participation in the *BASICS* intervention, and completed a final data collection point at two weeks following the

intervention. Both groups received the formal Brief Alcohol Screening Intervention for College Students (*BASICS*) intervention, which required completion of a full-battery exploring substance use behaviors, provided students with a personalized feedback report regarding the substance use behaviors they endorsed, and participated in a small group motivational enhancement discussion that explored risk factors and harm reduction strategies related to substance use. The abbreviated repeated measure inventory assessed twelve domains of outcome variables related to student substance use, related risk factors, and pro-social change behaviors. The domains include: (1) alcohol use; (2) marijuana use; (3) typical blood alcohol concentration; (4) peak blood alcohol concentration;(5) hazardous drinking behaviors; (6) alcohol-related consequences; (7) risky sexual behaviors; (8) readiness for change; (9) harm-reduction strategies; (10) student engagement; (11) depression and anxiety; and (12) coping behaviors.

Table 1. Randomized Repeated-Measures Design

Treatment Group ($n = 100$)	O ₁	X	O ₂	O ₃
Waitlist-Control Group ($n = 100$)	O ₁		O ₂	X
				O ₃

note: O₁, O₂, and O₃, represent repeated measures observations; X represents *BASICS* intervention

Modifications to Original Research Design

Final analyses utilized only pretest and posttest data for both the intervention and waitlist-control group (please see table 2 below). Although data was collected at three time points, only two time points (pretest and posttest) were examined. For the intervention group only one posttest measurement was included in the final analyses; and for the waitlist-control group only the baseline measurement (opposed to the second data

collection point was used). This modification allowed for a more accurate comparison of group differences. This approach also minimized data lost from attrition at time 3 and potential non-compliance concerns for participants who did not complete data collection at instructed times (e.g., took follow-up surveys too close or far apart following the intervention).

Table 2. Modified Randomized Repeated-Measures Design

Treatment Group ($n = 100$)	O ₁	X	O ₂
Waitlist-Control Group ($n = 100$)	O ₁		X O ₂

Note: O₁ and O₂ represent repeated measures observations; X represents *BASICS* intervention.

BASICS Intervention

The *BASICS* intervention is comprised of self-report questionnaire, a personalized feedback report, and debriefing session to explore results of assessed domains of student self-reported drinking behaviors. The main domains covered in the assessment battery included demographic questions, college goals, frequency of alcohol and other drug use, expectancies of alcohol and other drug use, consequences associated with use behaviors, family history of alcohol and drug related concerns, alcohol-related protective behaviors, and motivation for change. The personalized feedback report provided an individualized compilation of information about blood alcohol concentration (BAC), the elimination of alcohol from the body, alcohol poisoning, risk factors of use behaviors, and readiness to change. During the debriefing session, students explored their feedback report, discussed their results with the guidance of a trained interventionist, and received suggested referrals based on identified risk factors associated with their alcohol use in a group

setting. Students also engaged in guided small group discussions exploring facts about alcohol and high risk drinking.

Participants and Sample Demographics

Participants included 63 students were recruited to the study through referrals from the Office of Conduct and Community Standards and the University Housing and Complex Directors. These students received sanctions to complete the alcohol-focused harm-reduction workshop for violations of university alcohol policies. The collected sample was originally comprised of 63 University of Oregon student participants who were mandated to complete *BASICS*, following violation of University policy. Participants self-selected to participate in the study and were randomly assigned to either the intervention or waitlist-control group. Group composition was fairly equal, 35 participants were assigned to the intervention group, and 28 participants were assigned to the waitlist-control group. A total of 10 participants did not complete post-test measurements and were removed from the final analyses. In addition, another participant was removed because they completed the post-test too close to the original intervention and did not allow for the two-week grace period. The final sample of 52 participants consisted of 25 intervention participants and 27 waitlist-control participants.

Total sample demographics reflected the following: (1) Age: 49 (92%) participants were between the ages of 18-19, and the entire sample ranged from ages 17-20; (2) Gender: 32 (62%) participants identified as male and 20 (38%) participants identified as female; (3) Ethnicity: 40 (77%) participants identified as Euro-American; (4) Sexual Orientation: 49 (94%) participants identified as heterosexual; (5) Class Status: 47 (90%) participants identified as freshman or first-year undergraduate students; and (6)

Previous Violation : 39 (75%) participants reported no previous University or alcohol-related violation.

Procedures

Approval and Support

Prior to implementing the study, stakeholders from the University of Oregon Counseling and Testing Center, University Office of Conduct and Community Standards, and University Housing were informed of the study concept and expressed formal support for the dissertation study. Prior to data collection, a Human Subjects Protocol was submitted to the Institutional Review Board (IRB). IRB approval was granted at the onset of the study and the author submitted documentation for continuing review as the study progressed. Please see the appendices for copies of the initial Human Subjects approval, continuation approval letter, and memorandum of understanding for the author and university stakeholders involved in the study.

Recruitment and Compensation

All students who received a sanction to complete the *BASICS* during the course of the study were invited to participate following completion of the required online questionnaire. The study's advertisement included: (1) a brief description of the study, (2) eligibility criteria for participation, (3) details about informed consent, (4) the approximate duration of time to complete the measures, (5) information about follow-up data collection points, (6) information about compensation, and (7) information for the principal investigator. To facilitate the recruitment process, participants were compensated \$10 in gift cards for completion of each data collection point, for a maximum of \$30 awarded for participation in the study. Following enrollment, students

were prompted to complete the 12-domain abbreviated measure (discussed above) in conjunction with their required assessment battery. Participants were also provided with information for their *BASICS* workshop date and time and proposed timeline for remainder of study requirements via an e-mail administered by the author. The author also sent a confirmation e-mail when their \$10 gift was distributed. Please see the appendices for a sample flow-chart of procedural steps, copies of the study advertisement, and copies of informed consent.

Data Collection

Data was collected online using a web-based survey format. The computer-based portion of *BASICS* operates from a secure web-based server. This portal supported data collection across the three time-points, registration functions for participation in the *BASICS* intervention, and other additional technology and administrative functions. Most importantly, this service provided secure and confidential storage of data and the principal investigator utilized a secured password to access the site. Participants registered using a private email and any potential identifying information was removed for data analyses purposes. Participants received email notifications to complete data points as was appropriate for their individual timeline. In an effort to promote data collection and address possible attrition, follow-up emails and phone calls were placed to participants who did not complete their follow-up surveys in a timely manner.

Intervention Fidelity

Intervention counselors included graduate teaching fellows, advanced doctoral students, and pre-doctoral psychology interns at the University of Oregon, Counseling and Testing Center. The principal investigator of the proposed study did not participate in

implementing the intervention for participants. Participating interventionist administered the *BASICS* intervention as a required component of their training at the UCTC and any additional involvement or contribution to the study was voluntary.

Treatment fidelity was promoted through comprehensive trainings and ongoing group supervision for interventionists by a Certified Alcohol and Drug Counselor (CADC) senior staff therapist. Prior to the study and facilitation of *BASICS*, all interventionists completed four two-hour trainings in motivational interviewing techniques (Miller & Rollnick, 2002) and *BASICS* intervention procedures facilitated by a CADC supervisor. The primary author engaged in ongoing consultation with UCTC administrative staff and clinical supervisors to address any questions or concerns pertaining to study implementation. In addition, the author provided a study manual and procedural flow-chart to support the implementation of the study.

In collaboration with supervising clinicians and the primary interventionist at the counseling center, a *BASICS* Intervention Fidelity Observation Checklist was constructed. This measure contained 6 items that explored interventionists' administration of *BASICS* components including: (1) Discussion of confidentiality and informed consent; (2) Review of alcohol related expectancies; (3) Psycho-education on the physiological effects of alcohol; (4) Review of the personalized feedback report; (5) Discussion of harm-reduction strategies; and (6) Information on agency and campus resources. Items were be scored as "yes" or "no" and interventionists are asked to sign and date the form. Completed fidelity check-lists are available for review in the appendices.

Measures

This section describes the measures used in the present study. Table 3 presents a list of the constructs of interest and related measures. Modifications to the originally proposed measures were made for academic function (measured by university grade point average, GPA), demographic information on participants university conduct records, and measurement of drinking quantity and frequency. In the original IRB, the principal investigator requested both official University Conduct and GPA records; however, the PI was not able to get official University GPA's due to log-in security of *BASICS* web-based portal (the university requires the use of students' 9-digit identification number) so the GPA measure was removed. Given that GPA is calculated quarterly, it is typically a stable construct and would not likely demonstrate change across the two month duration of the study. In addition, University conduct records could not be obtained, as the University Conduct Office requires a specific Release of Information Document which was not included in the informed consent procedures. The daily drinking questionnaire was used to generate Typical Blood Alcohol Concentration and Peak Blood Alcohol Concentration (aka "BAC"), as measures of drinking quantity and frequency are irrelevant outside of the contexts of gender and body weight. For review, all measures are included in the appendices.

Table 3. Description of Proposed Study Constructs and Measures

Construct	Measure	# of Items	Variable Type
Alcohol Use	The Daily Drinking Questionnaire (DDQ)		Varies
Marijuana Use	The Daily Drinking Questionnaire (DDQ)		Varies
Typical Blood Alcohol Concentration	The Daily Drinking Questionnaire (DDQ)		Varies
Peak Blood Alcohol Concentration	The Daily Drinking Questionnaire (DDQ)		Varies
Hazardous Drinking	The Alcohol Use Disorders Identification Test (AUDIT)	10	Ordinal Range = 0 to 4
Alcohol-Related Consequences	The Brief Young Adult Alcohol Consequences Questionnaire (B-YAACQ)	24	Binary (Yes/No)
Risky Sexual Behaviors	The Risky Sex Scale (RSS)	14	Ordinal Range = 1 to 5
Harm-Reduction Strategies	Harm Reduction Behavior Scale (HRBS)	12	Ordinal Range = 0 to 3
Readiness for change	The University of Rhode Island Change Assessment Scale (URICA)	32	Ordinal Range = 0 to 5
Student Engagement	The Student Engagement Instrument (SEI)	35	Ordinal Range = 1 to 4
Coping Strategies	The Brief COPE	28	Ordinal Range = 0 to 3
Depression & Anxiety	The Patient Health Questionnaire-4 (PHQ-4)	4	Ordinal Range = 0 to 3

Demographic and Descriptive Information. Demographic information included age, gender, body weight in pounds, education status, number of academic credits currently enrolled, self-labeled ethnicity, self-labeled sexual orientation, affiliation with

Greek Life (e.g. active member of a fraternity or sorority), student athlete status, number of previous university-related alcohol violations and sanctions, and number and type of previous non-university alcohol-related violations or citations (e.g. Minor in Possession (MIP) and Driving Under the Influence (DUI)).

Alcohol Use, Marijuana Use, Typical Blood Alcohol Concentration, and Peak Blood Alcohol Concentration. Alcohol and marijuana use quantity and frequency were assessed by the Daily Drinking Questionnaire (DDQ; Collins, Parks, & Marlatt, 1985), which provides information about alcohol and marijuana consumption on each day of a typical week. This measure required participants to report their typical drinking quantity, frequency, and the single greatest amount of alcohol consumption (peak consumption) over the past month. In addition, the measure also asked students to report the frequency, duration, and costs associated with their marijuana use. For the assessment of typical drinking quantity and most recent peak consumption, response options range from 0 to 15 or more drinks. Assessment of number of hours over which drinks were consumed ranges from 0 hours (0) to 10 or more hours (10). A “drink” is defined as 12 ounces of beer, 8 ounces of malt liquor, 10 ounces of microbrew or wine cooler, 4 ounces of wine, or 1 cocktail with 1 ounce of 100 proof liquor or 1.25 ounces of 80 proof liquor. Blood alcohol concentration (both typical and peak) was calculated using self-reported information on gender, body weight in pounds, and average drinking quantity and frequency. This measure and quantity-frequency-peak indexes have been effective in documenting reduction in drinking in previous studies with college student drinkers (Miller & Rollnick, 2002; Christiansen, Vik, & Jarchow, 2002). The DDQ has

demonstrated modest convergent validity of 0.50 with other measures of college student drinking (Collins, Parks, & Marlatt, 1985).

Hazardous Drinking. Hazardous drinking behaviors were measured by the Alcohol Use Disorders Identification Test (AUDIT; Saunders, Aasland, Babor, de la Fuente, & Grant, 1993). The AUDIT was developed in a multi-country collaborative project of the World Health Organization as a brief instrument for early detection of a broad spectrum of problems related to drinking, specifically “hazardous and harmful alcohol consumption” (Devos-Comby & Lange, 2008; Saunders et al., 1993). The AUDIT is a widely used measure, its’ reliability and validity have been well established by extant literature, and it has been utilized on a diverse array of populations including college students. Reinert and Allen (2007) conducted a reliability generalization analysis of 18 studies published since 2002, and calculated a median reliability coefficient of 0.83, with a range of 0.75 to 0.97. The AUDIT consists of 10 items that explore drinking behaviors and related outcome behaviors. The 10 items were selected from four main constructs established by the researchers including adverse psychological reactions (2 items), alcohol consumption (3 items), drinking behavior (3 items), and alcohol-related problems (2 items). Examples of questions include “how often during the last year have you had a feeling of guilt or remorse after drinking?” and “how often during the last year have you failed to do what was normally expected from you because of drinking?”. The measure consists of five response categories including ‘never’, ‘less than monthly’, ‘monthly’, ‘weekly’, and ‘daily’ or almost daily’. Responses are scored from 0 to 4 respectively.

Alcohol-Related Consequences. Alcohol related consequences were assessed by the Brief Young Adult Alcohol Consequences Questionnaire (B-YAACQ; Kahler, Strong, & Read, 2005). This measure was based on the 48-item Young Adult Alcohol Consequences Questionnaire (Kahler, Strong, Read, Palfai, & Wood, 2004)) and authors conducted analyses based on item response theory to select the determined set of items for measuring the alcohol problem severity continuum in college students. This measure consists of 24 items exploring 8 domains of problematic drinking: 1.) social-interpersonal consequences, 2.) impaired control, 3.) self-perception, 4.) self-care, 5.) risk behaviors, 6.) academic/occupational consequences, 7.) excessive drinking, and 8.) psychological dependence. Participants were asked to report the number of times in the past month and in the past year they endorsed the individual items. Examples of items include “I have felt badly about myself because of my drinking” and “I have taken foolish risks when drinking”. The authors reported a Cronbach’s alpha of 0.83.

Risky Sexual Behaviors. The Risky Sex Scale (RSS; O’Hare, 2001) is a 14 item scale used to measure drinking-related risky sexual behavior. The scale is comprised of three subscales which explore relevant domains of risky sex expectancies (RSE), risky sex behavior (RSB), and gender-based perceptions of risky sex (GSRP). The subscales demonstrate strong reliability and Cronbach’s alphas reported were: RSE, 0.93; RSB, 0.86; and GSRP, 0.77. The scale was normalized on a sample of undergraduate college students who were cited for their first time for university substance abuse violations. Examples of items include “if I have been drinking or using other drugs, I am probably more likely to engage in unprotected sex” and “women are more vulnerable to sexual assault if they have been drinking or using other drugs”. All items are scored on a 5-point

likert scale ranging from ‘strongly agree’ to ‘strongly disagree’. This scale is highly relevant to the proposed study because it combines alcohol related sexual expectancies with endorsed behaviors and attitudes in relation to alcohol use.

Harm Reduction Strategies. Presently there are no existing measures that explore the use of specific harm reduction strategies regarding alcohol and drinking behaviors. As a result, harm reduction strategies were measured by a constructed scale created by the primary author with the assistance of feedback from professional psychologists and certified drug and alcohol counselors. The items and domains of the scale are grounded in current literature and common strategies to prevent harm associated with alcohol use. The scale included 12 items exploring domains of harm reduction such as drink refusal strategies, peer contexts of drinking, drinking styles, safety precautions, and intrinsic motivations related to decisions of alcohol use. Examples of items include “I set specific limits of how much alcohol I will consume prior to beginning drinking”, “I space my consumption of alcohol over time”, and “I turn down offers of alcohol from others when I feel that I have reached my limit”. Items are scored on a 4-point scale from 0 “never” to 3 “always”.

Readiness for Change. Readiness for change were measured by the University of Rhode Island Change Assessment Scale (URICA; McConaughy, Prochaska, & Velicer, 1983). The URICA is a 32-item measure consisting of 4 subscales that assess stages of change including pre-contemplation, contemplation, action, and maintenance. Examples of items include “As far as I’m concerned, I don’t have any problems that need changing”, “I think I might be ready for some self-improvement”, “I’m doing something about the problems that had been bothering me”, and “It worries me that I might slip back

on a problem I have already changes, so I am here to seek help”. Response options range from (1) “strongly disagree” to (5) “strongly agree”. Internal consistency reliability coefficients were calculated for each subscale and ranged from 0.88 to 0.89, suggesting good internal reliability.

Student Engagement. Student engagement was measured by The Student Engagement Instrument (SEI; Appleton & Christenson, 2004). The SEI is a 35-item measure designed to examine six factors of cognitive engagement and psychological engagement including teacher-student relationships, control and relevance of school work, peer support for learning, future aspirations and goals, family support for learning, and extrinsic motivation from the perspective of the student. Examples of items include “My education will create many future opportunities for me”, “My family/guardian(s) want me to keep trying when things are tough at school”, and “At my school, teachers care about students”. Items were scored using a four point Likert-type rating ranging from (1) “Strongly Agree” to (4) “Strongly Disagree”. Analyses determined reliability coefficients of the six factors ranges from 0.72 to 0.88. (Appleton, Christenson, Kim, & Rechly, 2006).

Coping Strategies. Coping strategies were measured by The Brief COPE (Carver, 1997). The Brief COPE is a 28-item measure consisting of 14 subscales exploring domains of coping such as planning, emotional support, self-distraction, and substance use. Examples of items include “I’ve been taking action to try to make the situation better”, “I’ve been getting help and advice from other people”, and “I’ve been using alcohol or other drugs to make myself feel better”. Response options range from 0 “I

haven't been doing this at all" to 3 "I've been doing this a lot". Reliability of subscales ranged from 0.50 to 0.90, suggesting good internal reliability.

The Brief COPE (Carver, 1997) is a widely used measure, and in one study, Park, Armeli, and Tennen (2004) used the instrument to explore the relationship between daily stress, coping processes, and alcohol use among college students. The scale was not designed to create an overall coping composite or sum score, and the author suggests that interpretation of coping behaviors be examined independently by each sub-scale.

Depression and Anxiety. Depression and anxiety was measured by the Patient Health Questionnaire-4 (PHQ-4; Löwe et al., 2010). The measure is an ultra-brief self-report questionnaire that consists of a 2-item depression scale (PHQ-2) and a 2-item anxiety scale (GAD-2). Participants were asked "over the past two week, how often have you been bothered by the following items: (1) little interest or pleasure in doing things, (2) feeling down, depressed, or hopeless, (3) feeling nervous, anxious, or on edge, and (4) not being able to stop or control worrying?". Items are scored on a 4-point scale ranging from (0) "not at all", (1) "several days", (2) "more than half the days", (3) "nearly every day". The composite PHQ-4 score ranges from 0 to 12. Authors validated the questionnaire on a sample of over 5000 participants and reported an overall Cronbach's alpha of 0.82.

CHAPTER III

RESULTS

Preliminary Analyses

Preliminary analyses included exploration of internal consistency for study measures, descriptive statistics of the observed variables, examination of the assumptions of normality, and independent samples t-test to determine the presence of baseline group differences.

Internal Consistency Reliability of Dependent Measures

Cronbach's alpha tests were conducted at Pre-and-Post Tests to examine the internal consistency estimates of items within each dependent measure including: AUDIT (hazardous drinking); B-YAACQ (alcohol consequences); URICA (readiness for change); HRBS (harm reduction); RSS (risky sexual behavior); SEI (student engagement); PHQ-4 (depression and anxiety); and Brief-Cope (coping). The remaining variables of interest (e.g., Alcohol Use Count, Marijuana Use Count, Typical BAC, and Peak BAC) were not examined because they are not measures with individual items/questions.

A commonly acceptable interpretation of alpha coefficients is, "> .9 excellent, >.8 good, > .7 acceptable, > .6 questionable, > .5 poor, < .5 unacceptable". Internal consistency for all measures ranged between acceptable and excellent. The results indicate that the selected instruments were reliable measures at both pretest and posttest. Internal consistency estimates, calculated by Chronbach's alpha, are presented in Table 4.

Table 4. Internal Consistency Estimates of Dependent Measures

Measure	Items	α Pre-Test	α Confidence Interval	α Post-Test	α Confidence Interval
1. AUDIT	10	0.794	0.710 – 0.862	0.692	0.555 – 0.801
2. B-YAACQ	24	0.870	0.818 – 0.913	0.865	0.807 – 0.912
3. URICA	32	0.929	0.901 – 0.953	0.961	0.943 – 0.975
4. HRBS	12	0.808	0.729 – 0.872	0.858	0.795 – 0.907
5. RSS	14	0.865	0.810 – 0.909	0.917	0.880 – 0.946
6. SEI	35	0.958	0.941 – 0.972	0.946	0.924 – 0.965
7. PHQ	4	0.861	0.794 – 0.909	0.890	0.833 – 0.931
8. Brief Cope	28	0.943	0.921 – 0.962	0.961	0.943 – 0.975

Missing Data

The total missing data from ranged from 0-5.8 % across dependent variables. To determine if data was missing at random, Little’s MCAR (Missing Completely at Random) tests was used; data were determined to be missing completely at random at baseline ($\chi^2 = 84.915$ (73), $p = .161$) and post-test ($\chi^2 = 18.819$ (11), $p = .064$). To address missing data, expectation maximization (EM) was employed at the mean scale score level; however, data failed to converge after a first attempt of 25 iterations and successfully converged at 500 iterations. The remaining analyses will utilize this data set with no missing values. Expectation maximization (EM) has been identified to be an appropriate statistical approach to address missing data. The EM algorithm produces estimates by repeatedly iterating through two steps, the E-step (“expectation”) and the M-step (“maximization”) until the convergence criterion is met, at which point the algorithm has produced a final correlation matrix and vector means (Newman, 2003).

Multivariate Assumptions

Multivariate statistical analyses hold three general assumptions including: (1) normality; (2) linearity; and (3) homoscedasticity. Prior to examining multivariate normality, univariate normality of the 12 continuous variables of interests at pre and post-test (Alcohol Use Count, Marijuana Use Count, Typical BAC, Peak BAC, Hazardous Drinking, Alcohol Consequences, Readiness for Change, Harm-Reduction Behavior Scale, Risky-Sex Scale, Student Engagement Inventory, Depression & Anxiety, and Coping) were explored by through normal probability plots (aka Q-Q plots), and values of skewness and kurtosis measured through descriptive statistics. Descriptive statistical analyses of the dependent variables produced univariate n-size, mean, standard deviation, skewness, and kurtosis per treatment group. Results demonstrated significant skewness and kurtosis for the following variables: Marijuana Use Count, Typical BAC, Peak BAC, Student Engagement, Denial (Cope), Disengagement (Cope). The statistics for skew ranged from -1.26 to 3.50 and the statistics for kurtosis ranged from -1.72 to 13.75. Means, standard deviations, skewness, and kurtosis are presented in tables 5 and 6.

Although this result violates the first assumption of normality, the skewed nature of the data is congruent with extant literature on substance abuse research in health and social science fields (Lui, Strawderman, Johnson, & O'Quigley, 2012). The presence of skew reflects the large portion of zero values in conjunction with the continuous non-zero (i.e., positive) values. When considering substance abuse measures, for example the daily drinking questionnaire, a zero-report is a true value and appropriately reflects abstinence. Extant literatures suggests that repeated measures multivariate analyses of variance (RM-

Table 5. Dependent Variable Means, Standard Deviation, n-size, Skewness (*p*-value), and Kurtosis (*p*-value) for Intervention Group

Variable	Time 1 (n = 26)				Time 2 (n = 26)			
	<i>M</i>	<i>SD</i>	Skew	Kurt.	<i>M</i>	<i>SD</i>	Skew	Kurt.
1. Alcohol Use Count	5.31	4.06	0.21	-1.17	3.08	2.30	0.99	2.06
2. Marijuana Count	5.38	10.04	3.08	10.30	3.08	5.11	1.92	3.66
3. Typical BAC	0.09	0.08	1.99	6.84	0.08	0.06	0.55	-0.25
4. Peak BAC	0.14	0.11	1.78	6.36	0.15	0.10	0.72	-0.26
5. Hazardous Drinking	7.27	4.18	0.97	2.08	8.11	4.54	0.74	0.39
6. Alcohol Cons.	6.85	5.75	0.69	-.68	2.54	3.46	1.38	0.97
7. Readiness /Change	4.14	3.00	0.58	-0.88	3.88	2.54	-0.14	-0.97
8. Harm Reduction	24.60	7.75	-1.24	2.75	24.46	6.54	-0.25	-0.44
9. Risky Sexual Beh.	39.08	10.54	-0.84	-0.21	37.65	13.97	-0.80	-0.73
10. St. Engagement	1.75	0.53	3.17	13.75	1.63	0.44	-0.15	-1.36
11. Dep. & Anxiety	0.41	0.59	1.73	2.09	0.35	0.41	0.65	-1.25
The Brief Cope	<i>M</i>	<i>SD</i>	Skew	Kurt.	<i>M</i>	<i>SD</i>	Skew	Kurt.
12 a. Active	1.75	0.96	-.02	-1.08	0.70	0.98	1.20	0.39
12 b. Planning	1.67	1.21	-0.07	-1.71	0.66	0.96	1.45	1.03
12 c. Positive Reframe	1.58	1.12	0.05	-1.47	0.80	1.09	0.99	-0.55
12 d. Acceptance	2.10	0.98	-0.60	-1.08	1.22	1.32	0.39	-1.72
12 e. Humor	0.92	0.97	0.81	-0.26	1.07	1.19	0.69	-1.13
12 f. Religion	1.02	1.16	0.80	-0.86	0.46	0.82	1.83	2.77
12 g. Emotional Sup.	1.35	1.03	0.39	-0.86	0.51	0.87	1.84	2.72
12 h. Instrumental	1.13	1.13	0.63	-0.96	0.52	0.78	1.32	0.53
12 i. Self-Distraction	1.35	1.05	0.42	-0.98	0.87	1.01	0.57	-1.40
12 j. Denial	0.35	0.67	2.73	9.06	0.09	0.28	2.98	7.90
12 k. Venting	0.96	0.96	0.89	-0.14	0.25	0.43	1.23	-0.46
12 l. Substance Use	0.38	0.77	2.23	4.89	0.18	0.48	2.13	3.36
12 m. Disengagement	0.23	0.65	3.50	13.51	0.13	0.36	3.07	9.36
12 n. Self-Blame	1.06	0.97	0.71	-0.26	0.27	0.43	1.11	-0.67

Table 6. Dependent Variable Means, Standard Deviation, Skewness, and Kurtosis for Waitlist-Control

Variable	Time 1 (n = 27)				Time 2 (n = 27)			
	<i>M</i>	<i>SD</i>	Skew	Kurt.	<i>M</i>	<i>SD</i>	Skew	Kurt.
1. Alcohol Use Count	3.63	2.59	0.26	-1.14	2.59	2.50	1.33	1.90
2. Marijuana Use Count	5.03	10.16	2.70	8.81	3.15	4.85	1.40	0.47
3. Typical BAC	0.09	0.07	0.77	-0.28	0.07	0.06	1.13	0.65
4. Peak BAC	0.16	0.13	2.04	5.88	0.13	0.12	1.65	3.95
5. Hazardous Drinking	6.52	3.60	0.56	0.41	7.30	3.35	0.47	0.23
6. Alcohol Consequences	5.15	3.59	0.12	-1.12	1.93	2.50	1.33	1.07
7. Readiness for Change	3.64	2.54	0.59	0.40	4.16	3.41	0.29	-0.22
8. Harm Reduction	24.92	5.72	-0.20	-0.95	25.22	4.81	-0.65	0.91
9. Risky Sexual Behavior	39.50	8.85	-0.82	-0.23	40.48	10.21	-0.11	-0.48
10. Student Engagement	1.80	0.39	-0.47	-0.16	1.82	0.36	-0.52	0.67
11. Depression & Anxiety	0.71	0.75	0.86	-0.26	0.49	0.78	1.92	3.46
The Brief Cope	<i>M</i>	<i>SD</i>	Skew	Kurt.	<i>M</i>	<i>SD</i>	Skew	Kurt.
12 a. Active	1.83	0.90	-0.40	-0.46	1.33	1.20	0.05	-1.71
12 b. Planning	1.65	1.14	-0.23	-1.33	1.39	1.24	0.03	-1.74
12 c. Positive Reframe	1.98	0.97	-0.81	-0.15	1.39	1.15	0.07	-1.47
12 d. Acceptance	2.19	0.91	-1.14	0.58	1.57	1.21	-0.10	-1.61
12 e. Humor	0.96	1.11	0.86	-0.62	0.91	1.07	0.69	-1.00
12 f. Religion	0.48	0.91	1.85	2.58	0.63	1.05	1.47	0.78
12 g. Emotional Support	0.98	1.13	0.83	-0.85	0.85	0.90	0.61	-0.63
12 h. Instrumental	1.13	1.09	0.51	-1.07	0.87	0.95	0.66	-0.80
12 i. Self-Distraction	1.56	0.96	-0.34	-0.74	1.09	1.17	0.64	-1.11
12 j. Denial	0.50	1.01	1.76	1.55	.033	0.72	2.14	3.47
12 k. Venting	1.06	1.07	0.82	-0.64	0.65	0.94	1.42	1.09
12 l. Substance Use	0.46	0.85	2.18	4.38	0.37	0.48	2.17	3.28
12 m. Disengagement	0.48	0.99	2.04	2.94	0.31	0.72	2.69	7.45
12 n. Self-Blame	0.98	1.12	0.82	-0.80	0.93	1.01	0.86	-0.23

MANOVA) are robust statistical techniques, and can generally manage deviations from standard assumptions of normality (Mertler & Vannatta, 2004).

Blanca and colleagues (2013) suggest that researchers might improve the relevance of their robustness findings by using a range of typical for their discipline, rather than theoretical distributions of skewness and kurtosis statistics. In addition, the authors conclude that researchers should consider using the nonparametric statistics and tests with robust estimators that have been proposed as alternatives to parametric tests for independent groups and repeated measures if the power and Type I and Type II error rates are distorted (Blanca, Arnau, Lopez-Montiel, et al., 2013).

Outliers

Exploratory data analyses on variables of interests were conducted to address the presence of potential outliers. Univariate analyses of descriptive statistics (e.g., boxplots) identified several outliers on dependent variables of interests at baseline and post-test (Marijuana use, Typical BAC, and Peak BAC); however, the reported scores are plausible in the context of high risk substance use behaviors and were left in the data accordingly.

Intercorrelations

Intercorrelations between dependent variables of interests across time-points were calculated and displayed in tables 7 and 8. Strongest intercorrelations occurred between: (1) Alcohol Use Count; (2) Marijuana Use Count; (3) Typical BAC; (4) Peak BAC; (5) Hazardous Drinking; and (6) Alcohol Consequences. Results indicate strong relationships between examined variables of substance use behaviors. In addition, strong correlations were also shown between risky sexual behavior and alcohol consequences, and risky

sexual behavior and an inverse relationship with harm-reduction. Significant correlations for coping subscales and dependent variables of interest are reported separately. Please refer to tables 5 and 6 for correlation information on the dependent variables of interest.

The following is a description of statistically significant Pearson correlations across the fourteen coping subscales and remaining eleven variables of interest at pretest:

(1) Active coping was correlated with readiness for change ($p = 0.392^{***}$) and depression and anxiety ($p = 0.334^*$); (2) Planning was correlated with readiness for change ($p = 0.408^*$) and depression and anxiety ($p = 0.424^*$); (3) Positive reframe was correlated with readiness for change ($p = 0.452^{**}$) and depression and anxiety ($p = 0.383^*$); (4) Acceptance was correlated with alcohol use ($p = -0.301^*$) and marijuana use ($p = -0.387^{**}$), and was correlated with readiness for change ($p = 0.374^{**}$) and depression and anxiety ($p = 0.286^*$); (5) Humor was correlated with harm reduction ($p = 0.281^{**}$) and student engagement ($p = 0.317^*$); (6) Religion was correlated with alcohol use ($p = 0.297^*$) and depression and anxiety ($p = 0.342^*$); (7) Emotional support was correlated with harm reduction ($p = 0.369^{**}$) and depression and anxiety ($p = 0.278^{**}$); (8) Instrumental support was correlated with peak BAC ($p = 0.273^*$), harm reduction ($p = 0.278^*$), and depression and anxiety ($p = 0.386^{**}$); (9) Self-distraction was correlated with readiness for change ($p = 0.307^*$) and student engagement ($p = 0.294^*$); (10) Denial was correlated with readiness for change ($p = 0.341^*$), student engagement ($p = 0.485^{**}$), and depression and anxiety ($p = 0.376^{**}$); (11) Venting was correlated with readiness for change ($p = 0.403^{**}$), student engagement ($p = 0.343^*$), and depression and anxiety ($p = 0.457^{**}$); (12) Substance use was correlated with student engagement ($p = 0.620^{**}$) and depression and anxiety ($p = 0.361^{**}$); (13) Disengagement was correlated with

student engagement ($p = 0.518^{**}$) and depression and anxiety ($p = 0.450^{**}$); and (14) Self-blame was correlated with readiness for change ($p = 0.426^{**}$), student engagement ($p = 0.302^*$), and depression and anxiety ($p = 0.497^{**}$). Overall, coping subscales were most consistently correlated with readiness for change, student engagement, and depression and anxiety outcome measures.

Pre-Intervention Group Equivalence

Preliminary analyses also included an examination of the potential group differences at baseline on key demographic measures and primary variables of interest. A series of chi-square tests (for the categorical variables: Gender, Ethnicity, Sexual Orientation, Class Status, and Previous Violation) and an independent samples t-test (for the continuous variable, age) were conducted. No significant pretest differences across demographic characteristics between intervention and control groups were found: Gender, $\chi^2(1, 53) = 0.01, p = 0.915$; Ethnicity, $\chi^2(6, 53) = 7.203, p = 0.302$; Sexual Orientation, $\chi^2(3, 53) = 2.982, p = 0.394$; Class Status, $\chi^2(1, 53) = 1.865, p = 0.172$; Violation, $\chi^2(4, 53) = 3.382, p = 0.496$; Age, $F(51) = 0.712, p = 0.403$.

In addition, independent samples t-tests, specifically Levene's Test for Equality of Variances, were conducted to test for potential significant differences between the intervention and waitlist-control groups on primary variables of interest at pretest. Analyses revealed baseline differences on two dependent variables of interest, alcohol use and alcohol consequences. To determine the magnitude of the differences, Cohen's d and effect size r were calculated. A commonly acceptable interpretation of effect size magnitude is, ">.2 small, >.5 medium, >.8 large" (Cohen, 1992). Alcohol use for the intervention group ($M = 5.28, SD = 4.14$) was higher than the waitlist-control group ($M =$

Table 7. Pearson Correlations between Dependent Variables at Pretest

Variable	1	2	3	4	5	6	7	8	9	10	11
1. Alcohol Use Count	1										
2. Marijuana Use Count	0.47**	1									
3. Typical BAC	0.208	0.060	1								
4. Peak BAC	0.228	0.119	0.785**	1							
5. Hazardous Drinking	0.574**	0.457**	0.600**	0.575**	1						
6. Alcohol Consequences	0.476**	0.551**	0.362**	0.527**	0.631**	1					
7. Readiness for Change	0.092	0.090	0.020	0.075	0.117	0.116	1				
8. Harm Reduction ^a	-0.131	-0.234	-0.160	-0.147	-0.283*	-0.188	-0.024	1			
9. Risky Sexual Behavior	0.242	0.027	0.318*	0.226	0.345*	0.366**	0.313*	-	1		
10. Student Engagement	-0.047	-0.022	-0.076	-0.109	-0.120	-0.190	0.326*	0.096	-0.060	1	
11. Depression & Anxiety	-0.023	-0.067	0.122	0.346*	0.145	0.205	.0350*	-0.009	0.004	0.034	1

Note: (^a) indicates a non-validated measure developed by principal investigator for purposes of the current study; * $p < .05$ (2-tailed), ** $p < .01$ (2-tailed).

Table 8. Pearson Correlations between Dependent Variables at Posttest

Variable	1	2	3	4	5	6	7	8	9	10	11
1. Alcohol Use Count	1										
2. Marijuana Use Count	0.148	1									
3. Typical BAC	0.304*	0.171	1								
4. Peak BAC	.0349*	0.115	0.709**	1							
5. Hazardous Drinking	0.451**	0.314*	0.461**	0.392**	1						
6. Alcohol Consequences	0.538**	0.087	0.226	0.487**	0.464*	1					
7. Readiness for Change	0.025	0.318*	-0.088	-0.152	0.310*	0.039	1				
8. Harm Reduction ^a	-0.206	-0.338*	-0.168	-0.268	-0.391**	-0.283*	-0.190	1			
9. Risky Sexual Behavior	0.278*	0.287*	0.130	0.161	0.377**	0.248	0.282*	-0.520**	1		
10. Student Engagement	0.129	0.116	-0.139	0.044	0.014	0.189	0.074	-0.220	0.193	1	
11. Depression & Anxiety	0.097	-0.033	-0.169	-0.111	0.201	0.196	0.449**	-0.091	0.175	0.319*	1

Note:(^a) indicates a non-validated measure developed by principal investigator for purposes of the current study; * $p < .05$ (2-tailed), ** $p < .01$ (2 tailed).

3.64, $SD = 2.59$); $t(39.713) = 1.699, p = 0.097$, two-tailed). Effect size was calculated, (Cohen's $d = .539$; $r = .260$) and the magnitude of the effect is medium. In addition, alcohol consequences were higher for the intervention group ($M = 7.08, SD = 5.74$) than the waitlist-control group ($M = 5.14, SD = 3.59$); $t(39.718) = 1.441, p = .157$, two-tailed). Effect size was calculated, (Cohen's $d = .457$; $r = .223$) and the magnitude of the effect is medium. Due the presence of baseline group differences on alcohol use and alcohol consequences, main analyses will compare differences in controlling for the measures versus including them in the model.

Independent-samples t-tests results indicated no statistically significant differences between the intervention and waitlist-control groups on the remaining baseline (Pre-Test) measures: Marijuana Use $F(51) = 0.160, p = 0.691$; Typical BAC, $F(51) = 0.548, p = 0.463$; Peak BAC, $F(51) = 0.153, p = 0.698$; Hazardous Drinking $F(51) = 0.036, p = 0.850$; Readiness for Change $F(51) = 1.119, p = 0.295$; Harm Reduction $F(51) = 0.789, p = 0.379$; Risky Sexual Behavior $F(51) = 1.141, p = 0.290$; Student Engagement $F(51) = 0.041, p = 0.840$; and Depression & Anxiety $F(51) = 3.186, p = 0.080$. Based on the interpretation of independent-samples t-tests and eta-squared, it was determined that the groups were reasonably equivalent on the remaining baseline measures of interest, and there was no need to adjust for baseline differences between the longitudinal comparison groups in further analyses.

Main Analyses

Following preliminary data analyses, main analyses and research questions were addressed using two-way between groups multivariate repeated measures analysis of covariance (RM-MANCOVA). The within-subjects factor, or independent variable (1),

was time measured at pre and post-test. The between-subjects factor, or independent variable (2), was treatment condition (i.e., intervention or waitlist-control group). Pretest alcohol use and alcohol consequences were identified as potential covariates, as there were observed group differences at baseline; however, subsequent analyses will explore multivariate analyses with and without the use of alcohol and alcohol consequences as covariates.

Separate RM-MANCOVAs were explored for: (1) Substance use and related risk factors with covariates (alcohol use and alcohol consequences); (2) Substance use and related risk factors without covariates (alcohol use and alcohol consequences); (3) Substance use and related risk factors with marijuana use as an additional between-subjects factor with covariates (alcohol use, alcohol consequences, and marijuana use); (4) Substance use and related risk factors with marijuana use as an additional between-subjects factor without covariates (alcohol use and alcohol consequences); (5) Harm reduction, readiness for change, and student engagement with covariates (alcohol use and alcohol consequences); (6) Harm reduction, readiness for change, and student engagement without covariates (alcohol use and alcohol consequences); and (7) Coping behaviors with covariates (alcohol use and alcohol consequences).

1. Substance Use and Related Risk Factors RM -MANCOVA

The first set of analyses sought to evaluate the effectiveness of the *BASICS* intervention on substance use and related risk factors (e.g., marijuana use, typical BAC, peak BAC, hazardous drinking, risky sexual behavior, and depression & anxiety) over time (e.g., pre and post-test) with pretest alcohol use and alcohol consequences as covariates. The efficacy of the intervention will be demonstrated if the interaction effect

is significant (i.e., time by treatment condition). Box's M statistic was used to test the assumption of homogeneity of variance-covariance matrices, $M = 145.358$, $F(78) = 1.381$, $p = .015$. Box's M was not significant at $p < .001$, thus it can be interpreted that the observed covariance matrices of the dependent variables are equal across groups.

RM-MANCOVA results are presented in table 9.

Table 9. Repeated Measures Multivariate Analysis of Covariance for Treatment Condition and Time, With Pretest Alcohol Use and Alcohol Consequences as Covariates for Substance Abuse and Related Risk Factors

Source	<i>df</i>	<i>F</i>	<i>p</i>	η^2
Alcohol Use (covariate)	6	2.262	.055*	.240
Alcohol Consequences (covariate)	6	4.590	.001***	.390
Treatment Condition (TC)	6	1.080	.390	.131
Time	6	1.628	.163	.185
Time x TC	6	0.965	.461	.119
Error	43			

Note. *F* ratios were generated from Pillai's Trace statistic. * $p < .05$. ** $p < .01$. *** $p < .001$.

Table 9 presents results for the RM-MANCOVA for treatment condition and time, with pretest alcohol use and alcohol consequences as covariates for substance abuse and related risk factors. The interaction between time and treatment condition was not significant. In addition, main effects for time and treatment condition were not significant. There were significant findings for main effects of the pretest covariates alcohol use and alcohol consequences. Alcohol use at pretest accounted for 24% of the variance, while alcohol consequences at pretest accounted for 39% of the variance. Univariate analysis of substance use and related risk factors across "Time" demonstrated significant findings for hazardous drinking and results are presented in figure 1. In addition, independent samples t-test were conducted to examine the differences between

intervention and control groups over time (pretest, posttest) for hazardous drinking scores and results are presented in table 10.

Figure 1

Hazardous Drinking Scores over Time

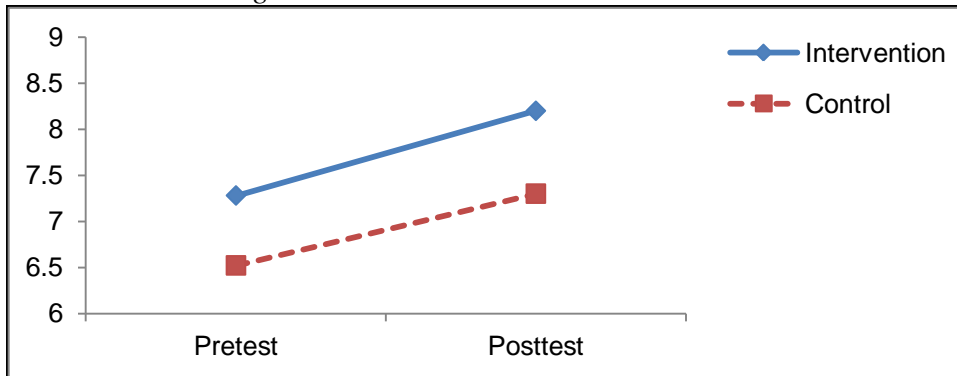


Figure 1 displays mean scores on for hazardous drinking by treatment condition over time. The simple effect for time was significant, $F(1, 48) = 5.612, p = 0.022$, partial eta-squared = 0.105. The results show that when controlling for baseline alcohol use and alcohol consequences, both groups demonstrated an increase in hazardous drinking behaviors from pretest to posttest. Although the intervention group appears to display a slightly higher level of hazardous drinking than the waitlist-control group, there is no simple effect for treatment condition. As seen in table 10 (below), the t-test results indicated that there were no group differences at either pretest or posttest. In sum, these results show that the *BASICS* intervention did not result in significant reduction on hazardous drinking behavior.

Table 10. Pretest-Posttest Differences Between Intervention and Waitlist-Control Groups for Hazardous Drinking Scores

Time	Int.		WL		df	t	p	Cohen's d	Effect Size -r
	M	SD	M	SD					
Pre	7.28	4.27	6.52	3.60	50	.697	.489	.197	.098
Post	8.20	4.61	7.30	3.35	50	.813	.420	.229	.114

2. Substance Use and Related Risk Factors RM-MANOVA (Without Covariates)

The next set of analyses sought to evaluate the effectiveness of the *BASICS* intervention on substance use and related risk factors (e.g., alcohol use, marijuana use, typical BAC, peak BAC, hazardous drinking, alcohol consequences, risky sexual behavior, and depression & anxiety) over time (e.g., pre and post-test) without the use of covariates. Although there were baseline differences on alcohol use and alcohol consequences measures (the intervention group endorsed higher scores for both), the magnitude of the effect size was small ($\eta^2 = 0.03$). While it is common practice to control for group differences through the use of covariates, the inclusion of pretest scores for alcohol use and alcohol consequences as covariates might interfere in detecting other significant results. Box's M statistic was used to test the assumption of homogeneity of variance-covariance matrices, $M = 268.848$, $F(136) = 1.290$, $p = .014$. Box's M was not significant at $p < .001$, thus it can be interpreted that the observed covariance matrices of the dependent variables are equal across groups. RM-MANCOVA results are presented in table 11.

Table 11. Repeated Measures Multivariate Analysis of Variance for Treatment Condition and Time for Substance Abuse and Related Risk Factors (No Covariates)

Source	<i>df</i>	<i>F</i>	<i>p</i>	η^2
Treatment Condition	8	1.219	.311	.185
Time	8	7.190	<.001***	.572
Time x Treatment Condition	8	1.131	.362	.174
Error	43			

Note. *F* ratios were generated from Pillai's Trace statistic. * $p < .05$. ** $p < .01$. *** $p < .001$.

Table 11 presents results for the RM-MANOVA for treatment condition and time for substance abuse and related risk factors without controlling for baseline differences on alcohol use and alcohol consequences. The interaction between time and treatment condition was not significant. The main effect for time was significant ($F(8, 43) = 7.290$, $p < .001$, partial eta-squared = 0.572; however, the main effect for treatment condition was not significant. Univariate analysis of substance use and related risk factors across "Time" demonstrated significant findings for alcohol use, marijuana use, and alcohol consequences. Results and independent samples t-tests for these significant univariate findings are presented figures 4-6 and tables 11-13. There were no significant univariate results for treatment condition.

Figure 2 displays mean scores on for alcohol use by treatment condition over time. The simple effect for time was significant, $F(1, 50) = 10.339$, $p = 0.002$, partial eta-squared = 0.171. The graph demonstrates that the intervention group had higher pretest scores than the control group at baseline, consistent with preliminary analyses.

Although there were baseline group differences for alcohol use, t-test results in table 12 below indicate that this difference was not statistically significant. In consideration of all these findings, it can be interpreted that the reduction in alcohol use over time was

significant, independent of baseline group differences, suggesting that participation in the *BASICS* intervention supported a significant reduction in alcohol use.

Figure 2

Alcohol Use over Time (No Covariates)

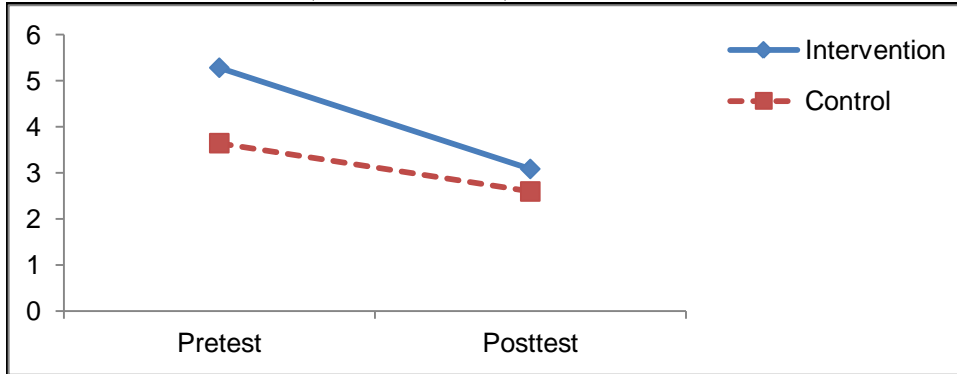


Table 12. Pretest-Posttest Differences Between Intervention and Waitlist-Control Groups for Alcohol Use (No Covariates)

Time	Int.		WL		<i>df</i>	<i>t</i>	<i>p</i>	Cohen's <i>d</i>	Effect Size <i>r</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>					
Pre	5.28	4.14	3.64	2.59	39.713	1.699	.097	.539	.260
Post	3.08	2.34	2.59	2.50	50	.724	.473	.205	.102

Figure 3 displays mean scores on for marijuana use by treatment condition over time. The simple effect for time was significant, $F(1, 50) = 4.688, p = 0.035$, partial eta-squared = 0.086. The graph reflects very similar mean scores for both groups, and a reduction in marijuana use from pretest to posttest. Results indicate that without controlling for baseline alcohol use and alcohol consequences, participants demonstrate a reduction in marijuana use across time; however, there were no between group differences which is confirmed by independent samples t-test results below in table 13.

Figure 3

Marijuana Use over Time (No Covariates)

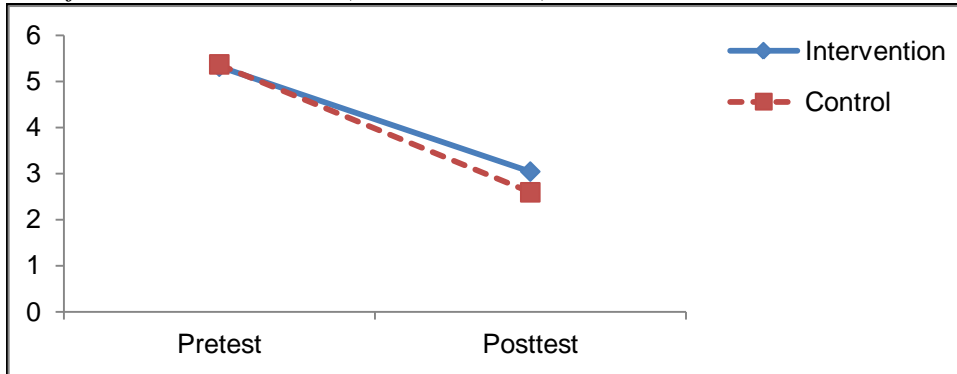


Table 13. Pretest-Posttest Differences Between Intervention and Waitlist-Control Groups for Marijuana Use (No-Covariates)

Time	Int.		WL		df	t	p	Cohen's d	Effect Size – r
	M	SD	M	SD					
Pre	5.32	10.24	5.38	9.93	50	-.020	.984	-.006	.003
Post	3.04	5.22	3.15	4.85	50	-.077	.939	-.022	.011

Figure 4 displays mean scores on for alcohol consequences by treatment condition over time. The simple effect for time was significant, $F(1, 50) = 31.679, p < 0.001$, partial eta-squared = 0.388. The graph demonstrates that the intervention group had higher pretest scores than the control group at baseline, consistent with preliminary analyses. Although there were baseline group differences for alcohol use, t-test results in table 14 below indicate that this difference was not statistically significant. In consideration of all these findings, it can be interpreted that the reduction in alcohol consequences over time was significant independent of baseline group differences, suggesting that participation in the *BASICS* intervention supported a significant reduction in alcohol related consequences.

Figure 4

Alcohol Consequences over Time (No Covariates)

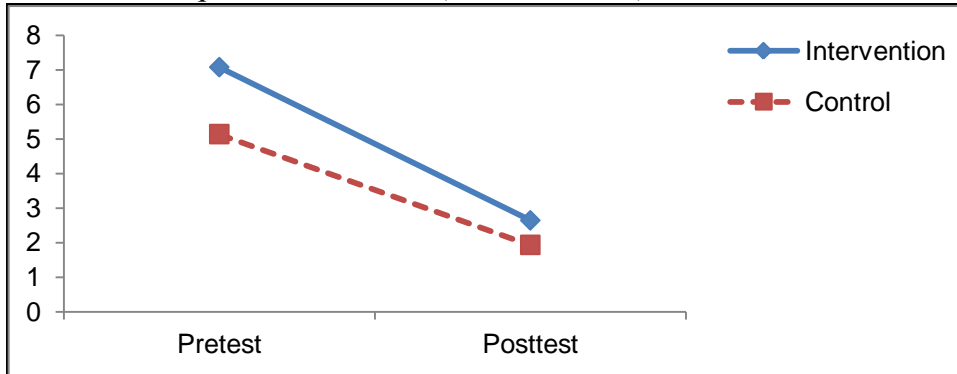


Table 14. Pretest-Posttest Differences Between Intervention and Waitlist-Control Groups for Alcohol Consequences (No-Covariate)

Time	Intervention		Waitlist		<i>df</i>	<i>t</i>	<i>p</i>	Cohen's <i>d</i>	Effect Size <i>r</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>					
Pretest	7.08	5.74	5.15	3.59	39.718	1.441	.157	.457	.223
Posttest	2.64	3.49	1.93	2.50	50	.854	.397	.242	.120

3. Marijuana Group Identification, Substance Use, and Related Risk Factors RM –

MANCOVA

Although *BASICS* is designed primarily as an alcohol-focused intervention, the daily drinking questionnaire also captures marijuana use frequency. Reports of marijuana use at time one and/or time 2 revealed that 24 participants denied engaging in marijuana use over the course of the study, and 29 participants endorsed marijuana use during the study. With this information, another categorical variable was constructed, dichotomizing the sample into non-marijuana users (i.e., participants who denied use during the study) and marijuana users (i.e., participants who endorsed marijuana use during the study). Sample size distribution of treatment condition and marijuana condition revealed the

following *n*-sizes: (1) Intervention group, non-marijuana users, $n = 10$; (2) Intervention group, marijuana users, $n = 14$; (3) Waitlist-control group, non-marijuana users, $n = 15$; and (4) Waitlist-control group, marijuana users, $n = 13$.

The next set of analyses examined the impact of marijuana use on substance use and related risk factors outcome variables. In this model, the independent variable was time (pretest, posttest) and there were two between subjects' variables, treatment condition (intervention, waitlist-control) and marijuana use (non-marijuana use, marijuana use). The previous covariates (alcohol use and alcohol consequences at pretest) were included with the addition of a third covariate, pretest marijuana use. Dependent variables included typical BAC, peak BAC, hazardous drinking, risky sexual behavior, and depression and anxiety. Box's M statistic was used to test the assumption of homogeneity of variance-covariance matrices, $M = 269.654$, $F(110) = 1.508$, $p = .001$. Box's M was significant at $p < .001$, thus it can be interpreted that the observed covariance matrices of the dependent variables are equal across groups and the assumption was not met.

Table 15 depicts RM-MANCOVA results for treatment condition, marijuana condition and time, with pretest alcohol use, alcohol consequences, and marijuana use as covariates. The interaction between time, treatment condition, and marijuana condition was not significant. In addition, main effects for time, treatment condition, and marijuana condition were not significant. There were significant findings for main effects of the pretest covariate alcohol consequences, which accounted for 34% of the variance. There were no significant univariate post-hoc results for time, treatment condition, and marijuana condition across the dependent variables of interest. As a result, no further

analyses (i.e., independent samples t-tests) were conducted. Interpretation of these findings suggests that after controlling for marijuana use, alcohol use, and alcohol consequences at pretest, there was no significant effect of *BASICS* on substance use and related risk for both intervention and waitlist control groups.

Table 15. Repeated Measures Multivariate Analysis of Covariance for Treatment Condition, Marijuana Condition and Time, With Pretest Alcohol Use, Alcohol Consequences, and Marijuana Use as Covariates for Substance Abuse and Related Risk Factors

Source	<i>df</i>	<i>F</i>	<i>p</i>	η^2
Alcohol Use (covariate)	5	1.259	.300	.133
Alcohol Consequences (covariate)	5	4.127	.004**	.335
Marijuana Use (covariate)	5	0.690	.634	.078
Treatment Condition (TC)	5	1.103	.374	.119
Marijuana Condition (MC)	5	1.215	.319	.129
Time	5	1.520	.205	.156
Time x TC x MC	5	0.965	.461	.119
Error	41			

Note. *F* ratios were generated from Pillai's Trace statistic. * $p < .05$. ** $p < .01$. *** $p < .001$.

4. Marijuana Group Identification, Substance Use, and Related Risk Factors RM – MANCOVA (Without Covariates)

Prior analyses demonstrated that baseline differences for alcohol use and alcohol consequences were moderate in magnitude and inclusion of them as covariates may inappropriately account for statistical variance. A follow-up analysis was conducted to explore the impact of marijuana use on substance use factors, without controlling for baseline differences on alcohol use and alcohol consequences. In this model, the independent variable was time (pretest, posttest) and there were two between subjects' variables, treatment condition (intervention, waitlist-control) and marijuana use (non-marijuana use, marijuana use). Only pretest marijuana use was included as a covariate.

Dependent variables included alcohol use, typical BAC, peak BAC, hazardous drinking, alcohol consequences, risky sexual behavior, and depression and anxiety. Box's M statistic was not computed due to nonsingular cell covariance matrices.

Table 16 depicts RM-MANCOVA results for treatment condition, marijuana condition, and time with pretest marijuana use a covariate. The interaction effect of the overall model was not significant. The main effects for treatment condition and marijuana condition were not significant; however, there was a significant main effect for time. Post-hoc univariate analyses demonstrated significant simple effects for time (hazardous drinking and alcohol consequences), marijuana condition (alcohol use, hazardous drinking, alcohol consequences, and risky sexual behavior), and the interaction of time by treatment condition by marijuana condition (peak BAC and alcohol consequences). The following discussion, figures, and follow-up two-way ANOVAs will focus on the simple effects for marijuana condition.

Table 16. Repeated Measures Multivariate Analysis of Covariance for Treatment Condition, Marijuana Condition and Time, With Pretest Marijuana Use as a Covariate for Substance Abuse and Related Risk Factors

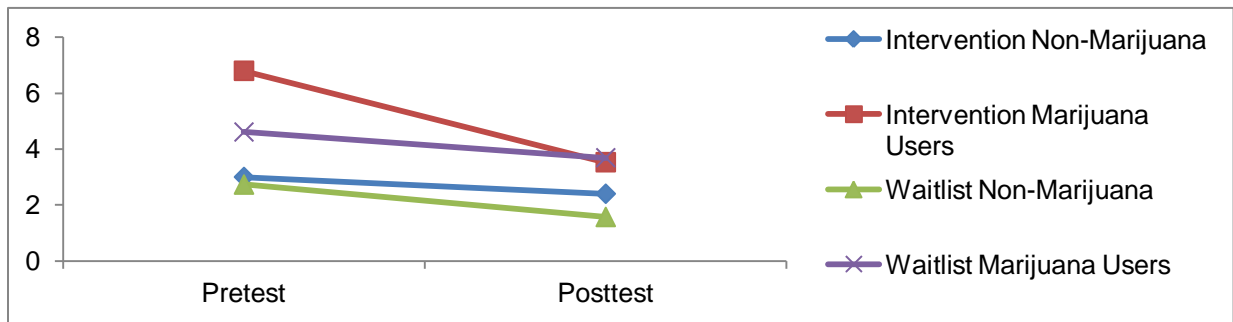
Source	<i>df</i>	<i>F</i>	<i>p</i>	η^2
Marijuana Use (covariate)	7	0.883	.528	.131
Treatment Condition (TC)	7	1.209	.320	.171
Marijuana Condition (MC)	7	2.464	.033	.296
Time	7	7.009	<.001***	.545
Time x TC x MC	7	0.971	.465	.142
Error	41			

Note. *F* ratios were generated from Pillai's Trace statistic. * *p* < .05. ** *p* < .01. *** *p* < .001.

Figure 5 displays mean scores on for alcohol use by treatment and marijuana condition over time. The simple effect for marijuana condition was significant, $F(1, 47) = 7.511, p = .009$, partial eta-squared = 0.138. The graph demonstrates that marijuana users in the intervention group had the highest pretest alcohol use scores ($n = 15, M = 6.80, SD = 4.21$), followed by marijuana users in the waitlist group ($n = 13, M = 4.62, SD = 2.72$), then non-marijuana users in the intervention group ($n = 10, M = 3.00, SD = 2.91$), and finally non-marijuana users in the control group ($n = 14, M = 2.73, SD = 2.17$).

Figure 5

Alcohol Use over Time by Treatment and Marijuana Condition



Follow-up two-way ANCOVAs were conducted for pre and post-test, with alcohol use as the dependent variable, treatment condition as the random factor, marijuana condition as the fixed factor, and pretest marijuana use as the covariate. At pretest, Levene’s test of equality of difference was violated, $F(3, 48) = 4.936, p = .005$, which encourages the use of a more strict alpha coefficient (e.g., $p < .001$) to detect significant differences between groups; however, no significant group differences emerged at baseline (see table 17). In addition, there were no significant group

differences at posttest (see table 18). In summary, marijuana users endorsed more alcohol use than non-marijuana users; however, at pretest there were no statistically significant differences between intervention and control groups.

Table 17. Univariate Analysis of Covariance for Treatment Condition and Marijuana Condition, With Pretest Marijuana Use as a Covariate for Pretest Alcohol Use

Source	<i>df</i>	<i>F</i>	<i>p</i>	η^2
Marijuana Use (covariate)	1	7.279	.010*	.134
Treatment Condition (TC)	1	1.626	.423	.619
Marijuana Condition (MC)	1	1.820	.354	.564
TC x MC	1	1.678	.202	.034
Error	47			

Note. * $p < .05$.

Table 18. Univariate Analysis of Covariance for Treatment Condition and Marijuana Condition, With Pretest Marijuana Use as a Covariate for Posttest Alcohol Use

Source	<i>df</i>	<i>F</i>	<i>p</i>	η^2
Marijuana Use (covariate)	1	1.715	.197	.035
Treatment Condition (TC)	1	.269	.695	.221
Marijuana Condition (MC)	1	10.52	.079	.834
TC x MC	1	.679	.408	.015
Error	47			

Figure 6 displays hazardous drinking mean scores by treatment and marijuana condition over time. The simple effect for marijuana condition was significant, $F(1, 47) = 4.568, p = .038$, partial eta-squared = .089. Hazardous drinking scores at pretest were highest for intervention group marijuana users, followed by waitlist-control group marijuana users, then waitlist control non-marijuana users, and finally intervention group non-marijuana users. The graph demonstrates that hazardous drinking scores for all participants increased overtime, and the simple effect for time was also significant, $F(1, 47) = 5.332, p = .025$, partial eta-squared = .102. These results are congruent with previous findings when controlling for pretest alcohol use and alcohol consequences.

Means and standard deviations by treatment and marijuana condition for hazardous drinking mean scores are presented in table 19 below.

Figure 6

Hazardous Drinking over Time by Treatment and Marijuana Condition

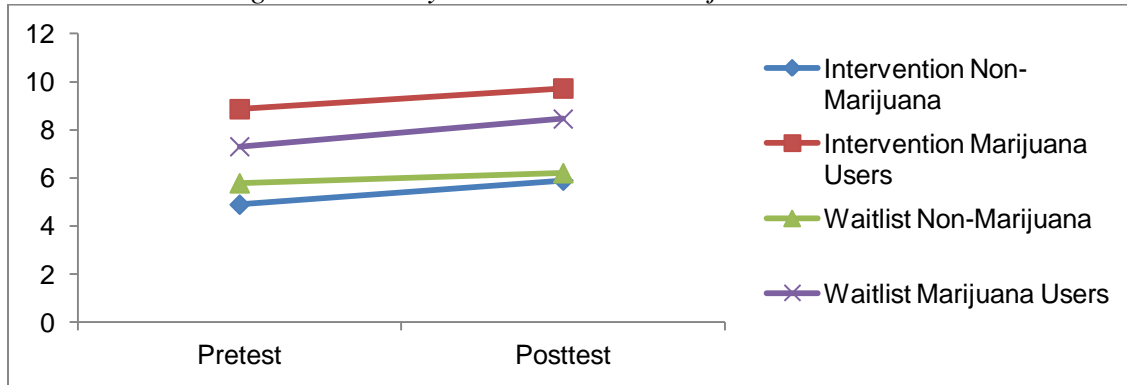


Table 19. Means and Standard Deviations by Treatment and Marijuana Condition for Hazardous Drinking Mean Scores.

Time	Int. Non-MJ (n = 10)		Int. MJ Users (n = 14)		WL Non-MJ (n = 15)		WL MJ Users (n = 13)	
	M	SD	M	SD	M	SD	M	SD
Pre	4.90	2.96	8.87	4.34	5.79	4.19	7.31	2.78
Post	5.90	3.25	9.73	4.83	6.21	3.98	8.46	2.07

Follow-up two-way ANCOVAs were conducted for pre and post-test, with hazardous drinking as the dependent variable, treatment condition as the random factor, marijuana condition as the fixed factor, and marijuana use at time one as the covariate. At pretest and posttest, Levene's test of equality of difference was not significant, ($F(3, 48) = .704, p = .555$; $F(3, 48) = 2.458, p = .074$) suggesting fairly equal group sizes. No significant group differences emerged at baseline (see table 20). In addition, there were no significant group differences at posttest (see table 21). In summary, marijuana users

scored higher on the hazardous drinking measure than non-marijuana users and all participants demonstrated increased hazardous drinking scores over-time; however, there were no statistically significant differences between intervention and waitlist-control groups. Findings suggest that the *BASICS* intervention was not effective at reducing hazardous drinking for participants.

Table 20. Univariate Analysis of Covariance for Treatment Condition and Marijuana Condition, With Pretest Marijuana Use as a Covariate for Pretest Hazardous Drinking

Source	<i>df</i>	<i>F</i>	<i>p</i>	η^2
Marijuana Use (covariate)	1	2.474	.122	.050
Treatment Condition (TC)	1	.114	.792	.103
Marijuana Condition (MC)	1	1.648	.369	.536
TC x MC	1	1.614	.210	.033
Error	47			

Note. * $p < .05$.

Table 21. Univariate Analysis of Covariance for Treatment Condition and Marijuana Condition, With Pretest Marijuana Use as a Covariate for Posttest Hazardous Drinking

Source	<i>df</i>	<i>F</i>	<i>p</i>	η^2
Marijuana Use (covariate)	1	.164	.687	.003
Treatment Condition (TC)	1	.385	.646	.277
Marijuana Condition (MC)	1	7.658	.092	.766
TC x MC	1	.585	.448	.012
Error	47			

Figure 7 displays alcohol consequences by treatment and marijuana condition over time. The simple effect for marijuana condition was significant, $F(1, 47) = 9.455$, $p = .004$, partial eta-squared = .167. The figure portrays that alcohol consequences at pretest were highest for the intervention marijuana users, followed by waitlist marijuana users, then waitlist non marijuana users, and intervention non-marijuana users. The graph demonstrates that endorsement of alcohol related consequences for all participants decreased overtime, and the simple effect for time was also significant, $F(1, 47) =$

20.246, $p < .001$, partial eta-squared = .301. Means and standard deviations by treatment and marijuana condition for alcohol consequences are presented in table 22 below.

Figure 7

Alcohol Consequences over Time by Treatment and Marijuana Condition

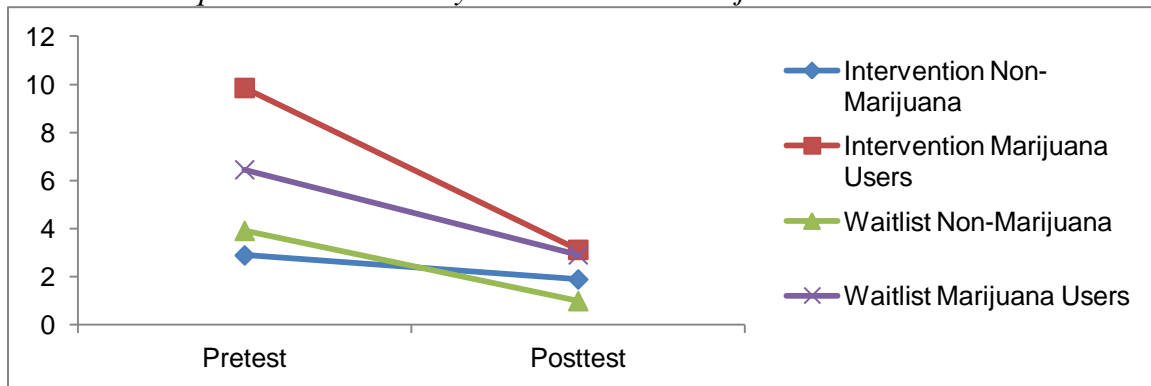


Table 22. Means and Standard Deviations by Treatment and Marijuana Condition for Alcohol Consequences.

Time	Int. Non-MJ (n = 10)		Int. MJ Users (n = 14)		WL Non-MJ (n = 15)		WL MJ Users (n = 13)	
	M	SD	M	SD	M	SD	M	SD
Pre	2.90	2.23	9.86	5.71	3.92	3.89	6.46	2.82
Post	1.90	2.88	3.13	3.85	1.00	1.30	2.92	3.09

Follow-up two-way ANCOVAs were conducted for pre and post-test, alcohol consequences as the dependent variable, treatment condition as the random factor, marijuana condition as the fixed factor, and marijuana use at time one as the covariate. At pretest and posttest, Levene's test of equality of difference was significant, ($F(3, 48) = 5.130, p = .004$; $F(3, 48) = 4.089, p = .012$), suggesting the use of a more strict alpha coefficient (e.g., $p < .001$) to detect significant differences between groups. No

significant group differences emerged at baseline; however, the interaction effect between treatment and marijuana condition approached statistical significance (see table 23). In addition, there were no significant group differences at posttest, although results for the marijuana condition neared statistical significance (see table 24). In summary, marijuana users endorsed more alcohol related consequences than non-marijuana users and all participants demonstrated reduced alcohol consequences over-time; however, there were no statistically significant differences between intervention and control groups on this measure. Findings suggest that the *BASICS* intervention was effective at reducing alcohol related consequences for participants.

Table 23. Univariate Analysis of Covariance for Treatment Condition and Marijuana Condition, With Pretest Marijuana Use as a Covariate for Pretest Alcohol Consequences

Source	<i>df</i>	<i>F</i>	<i>p</i>	η^2
Marijuana Use (covariate)	1	1.077	.305	.022
Treatment Condition (TC)	1	.308	.677	.236
Marijuana Condition (MC)	1	2.977	.307	.719
TC x MC	1	3.989	.052	.078
Error	47			

Table 24. Univariate Analysis of Covariance for Treatment Condition and Marijuana Condition, With Pretest Marijuana Use as a Covariate for Posttest Hazardous Drinking

Source	<i>df</i>	<i>F</i>	<i>p</i>	η^2
Marijuana Use (covariate)	1	.370	.546	.008
Treatment Condition (TC)	1	3.388	.313	.768
Marijuana Condition (MC)	1	5.213	.048	.364
TC x MC	1	.145	.705	.003
Error	47			

Figure 8 displays risky sexual behavior scores by treatment and marijuana condition over time. The simple effect for marijuana condition was significant, $F(1, 47) = 7.737, p = .008$, partial eta-squared = .141. The figure reflects that pretest scores on the

risky sexual behavior measure are higher for intervention and waitlist marijuana users.

Although the graph portrays some changes in pre and post-test for subgroups, the overall simple effect for time was not significant. Means and standard deviations by treatment and marijuana condition for risky sexual behavior are presented in table 25 below.

Figure 8

Risky Sexual Behavior over Time by Treatment and Marijuana Condition

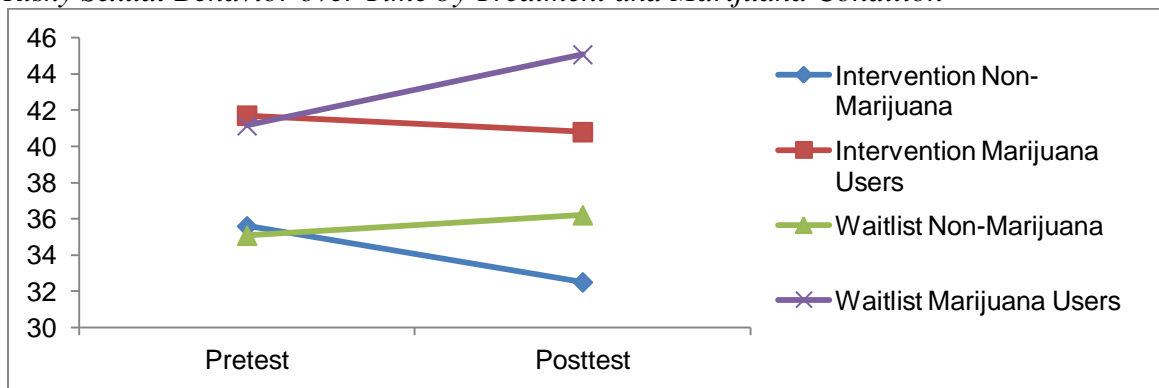


Table 25. Means and Standard Deviations by Treatment and Marijuana Condition for Risky Sexual Behavior.

Time	Int. Non-MJ (n = 10)		Int. MJ Users (n = 14)		WL Non-MJ (n = 15)		WL MJ Users (n = 13)	
	M	SD	M	SD	M	SD	M	SD
Pre	35.60	8.99	41.71	11.31	35.08	9.78	41.15	9.98
Post	32.50	16.55	40.80	11.89	36.21	9.30	45.08	9.39

Separate two-way analysis of covariance tests examined the between group differences for treatment and marijuana condition on risky sexual behavior scores at pre- and post-test . At pretest, Levene’s test of equality of difference was not significant, ($F(3, 48) = .579, p = .631$); however, at posttest Levene’s test was statistically significant ($F(3, 48) = 3.484, p = .023$). Significant group differences emerged at pre and posttest for marijuana condition (see tables 26 and 27), and findings suggest that participants engaged

in marijuana use endorse significantly higher risky sexual behaviors at pre-test and posttest; however, the observed differences were not impacted by treatment condition.

Table 26. Univariate Analysis of Covariance for Treatment Condition and Marijuana Condition, With Pretest Marijuana Use as a Covariate for Risky Sexual Behavior

Source	<i>df</i>	<i>F</i>	<i>p</i>	η^2
Marijuana Use (covariate)	1	1.457	.233	.030
Treatment Condition (TC)	1	2.612	.237	.544
Marijuana Condition (MC)	1	25.166	<.001***	.345
TC x MC	1	.003	.956	.000
Error	47			

Note. * $p < .05$.

Table 27. Univariate Analysis of Covariance for Treatment Condition and Marijuana Condition, With Pretest Marijuana Use as a Covariate for Posttest Hazardous Drinking

Source	<i>df</i>	<i>F</i>	<i>p</i>	η^2
Marijuana Use (covariate)	1	.292	.591	.006
Treatment Condition (TC)	1	106.975	.036	.988
Marijuana Condition (MC)	1	25.210	<.001***	.351
TC x MC	1	.013	.910	.000
Error	47			

5. Pro-Social Change Factors RM-MANCOVA

The fifth set of analyses sought to evaluate the effectiveness of the *BASICS* intervention on the 3 dependent variables that addressed pro-social change behaviors (e.g., readiness for change, harm reduction, and student engagement). The within subjects factor was time (pretest, posttest), the between subjects factor was treatment condition (intervention, waitlist-control), and the covariates included pretest scores for (1) alcohol use and (2) alcohol consequences. The efficacy of the *BASICS* intervention on positive change factors will be demonstrated by a significant interaction effect (i.e., time by

treatment condition). Box's M statistic was used to test the assumption of homogeneity of variance-covariance matrices, $M = 47.211$, $F(1, 21) = 1.956$, $p = .006$. Box's M was not significant at $p < .001$, thus it can be interpreted that the observed covariance matrices of the dependent variables are equal across groups.

Table 28 outlines RM-MANCOVA results for treatment condition and time, with pretest alcohol use and alcohol consequences as covariates for examination of pro-social change factors (e.g., readiness for change, harm reduction, and student engagement). The interaction between time and treatment condition was not significant. In addition, main effects for time and treatment condition were not significant. There were no significant findings for main effects of the pretest covariates alcohol use and alcohol consequences. In addition, there were no significant univariate simple effects for time or treatment condition across readiness for change, harm reduction, and student engagement measures. As a result, no further analyses (i.e., independent samples t-tests) were conducted. These results suggest that participation in the BASICS intervention had no significant impact on pro-social change behaviors for either intervention or waitlist control groups from pretest to posttest.

Table 28. Repeated Measures Multivariate Analysis of Covariance for Treatment Condition and Time, With Pretest Alcohol Use and Alcohol Consequences as Covariates for Pro-Social Change Factors

Source	<i>df</i>	<i>F</i>	<i>p</i>	η^2
Alcohol Use (covariate)	3	0.033	.992	.002
Alcohol Consequences (covariate)	3	1.446	.242	.086
Treatment Condition (TC)	3	0.795	.503	.049
Time	3	0.788	.507	.049
Time x TC	3	0.966	.417	.059
Error	46			

Note. *F* ratios were generated from Pillai's Trace statistic.

6. Pro-Social Change Factors RM-MANCOVA (Without Covariates)

The sixth set of analyses sought to evaluate the effectiveness of the *BASICS* intervention on the 3 dependent variables that addressed pro-social change behaviors (e.g., readiness for change, harm reduction, and student engagement) without the use of covariates. The within subjects factor was time (pretest, posttest) and the between subjects factor was treatment condition (intervention, waitlist-control). The efficacy of the *BASICS* intervention on positive change factors will be demonstrated by a significant interaction effect (i.e., time by treatment condition). Box's M statistic was used to test the assumption of homogeneity of variance-covariance matrices, $M = 47.211$, $F(1, 21) = 1.956$, $p = .006$. Box's M was not significant at $p < .001$, thus it can be interpreted that the observed covariance matrices of the dependent variables are equal across groups.

Table 29 outlines RM-MANCOVA results for treatment condition and time, with pretest alcohol use and alcohol consequences as covariates for examination of pro-social change factors (e.g., readiness for change, harm reduction, and student engagement). The interaction between time and treatment condition was not significant. In addition, main effects for time and treatment condition were not significant. In addition, there were no significant univariate simple effects for time or treatment condition across readiness for change, harm reduction, and student engagement measures. As a result, no further analyses (i.e., independent samples t-tests) were conducted. These results suggest that participation in the *BASICS* intervention had no significant impact on pro-social change

behaviors for either intervention or waitlist control groups from pretest to posttest, even when not controlling for baseline alcohol use and alcohol consequences.

Table 29. Repeated Measures Multivariate Analysis of Variance for Treatment Condition and Time, With Pretest Alcohol Use and Alcohol Consequences as Covariates for Pro-Social Change Factors

Source	<i>df</i>	<i>F</i>	<i>p</i>	η^2
Treatment Condition (TC)	3	1.070	.371	.063
Time	3	0.192	.901	.012
Time x TC	3	.655	.584	.039
Error	48			

Note. *F* ratios were generated from Pillai's Trace statistic.

7. Coping Behavior RM-MANCOVA

A seventh RM-MANCOVA was conducted for the coping scales with time (pretest, posttest) representing the within-subjects factor, treatment condition (intervention, waitlist-control) representing the between-subjects factor, and pretests scores for alcohol use and alcohol consequences as covariates. Box's test of equality of covariance matrices was not computed by the RM-MANCOVA analysis because there were fewer than two non-singular cell covariance matrices.

Table 30 outlines RM-MANCOVA results for treatment condition and time, with pretest alcohol use and alcohol consequences as covariates for examination of coping subscales. The interaction between time and treatment condition was significant. Main effects for time and treatment condition were also significant. There was significant main effect of the pretest covariate alcohol use. In addition, there were several significant univariate interaction effects for time and treatment condition (i.e., active, planning, religion, emotional-support, and self-blame). Results on the coping subscales suggest that both intervention and waitlist-control groups report less coping behaviors at posttest. A full multivariate analysis of covariance (MANCOVA) summary illustrates the pretest

means, posttest means, standard deviations, and multivariate analysis of covariance results for the interaction effects of time by treatment condition across the 14 coping subscales is presented in table 31.

Table 30. Repeated Measures Multivariate Analysis of Covariance for Treatment Condition and Time, With Pretest Alcohol Use and Alcohol Consequences as Covariates for Coping Subscales

Source	<i>df</i>	<i>F</i>	<i>p</i>	η^2
Alcohol Use (covariate)	14	3.389	.002**	.575
Alcohol Consequences (covariate)	14	0.501	.917	.167
Treatment Condition (TC)	14	2.850	.006**	.533
Time	14	2.445	.016*	.494
Time x TC	14	2.524	.013*	.502
Error	35			

Note. *F* ratios were generated from Pillai's Trace statistic. * $p < .05$. ** $p < .01$. *** $p < .001$.

Table 31. Pretest Means, Posttest Means, Standard Deviations, and Multivariate Analysis of Covariance Results for the Interaction Effects of Time by Treatment Condition Across the Fourteen Coping Subscales

Coping Subscale	Intervention Condition				Waitlist-Control				<i>F</i> (1,48)	<i>p</i>	η^2
	Pretest		Posttest		Pretest		Posttest				
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
Active	1.78	0.97	0.61	0.95	1.83	0.90	1.33	1.20	5.77	.020*	.107
Planning	1.72	1.21	0.59	0.94	1.65	1.14	1.39	1.24	7.14	.010**	.129
Positive Reframe	1.60	1.14	0.68	1.01	1.98	0.97	1.39	1.15	1.13	.294	.023
Acceptance	2.14	0.97	1.29	1.46	2.19	0.91	1.57	1.21	0.61	.439	.013
Humor	0.92	0.99	1.01	1.21	0.96	1.11	0.91	1.07	0.16	.688	.003
Religion	1.02	1.19	0.33	0.76	0.48	0.91	0.63	1.05	4.49	.040*	.085
Emotional Support	1.36	1.05	0.43	0.77	0.98	1.13	0.85	0.90	5.32	.025*	.100
Instrumental Support	1.14	1.15	0.44	0.77	1.13	1.09	0.87	0.95	0.98	.326	.020
Self-Distraction	1.32	1.06	0.76	0.96	1.56	0.96	1.09	1.17	0.01	.943	<.001
Denial	0.34	0.69	0.08	0.28	0.50	1.01	0.33	0.72	0.17	.680	.004
Venting	0.98	0.97	0.24	0.41	1.06	1.07	0.65	0.94	0.71	.405	.014
Substance Use	0.40	0.78	0.21	0.48	0.46	0.85	0.37	0.84	0.10	.750	.002
Disengagement	0.24	0.66	0.08	0.43	0.48	0.99	0.31	0.72	0.01	.918	<.001
Self-Blame	1.10	0.97	0.29	0.51	0.98	1.12	0.93	1.01	6.21	.016*	.115

Note. *F* ratios were generated from Pillai's Trace statistic. * *p* < .05. ** *p* < .01. *** *p* < .001.

Figure 9 displays active coping scores by treatment condition over time. The interaction effect of time by treatment condition was significant, $F(1, 48) = 5.77, p = .020$, partial eta-squared = .107. The simple effect for time was also significant, $F(1, 48) = 14.34, p < .001$, partial eta-squared = .230; however the simple effect for treatment condition was not significant, $F(1, 48) = 3.248, p = .078$, partial eta-squared = .063. The figure demonstrates a reduction in active coping for both the intervention and waitlist control group from pretest to posttest. Independent t-test results, outlined in table 32 below, indicated no group differences at pretest; however the two groups' active coping scores were significantly different at posttest, and the effect size was small.

Figure 9

Active Coping Scores over Time

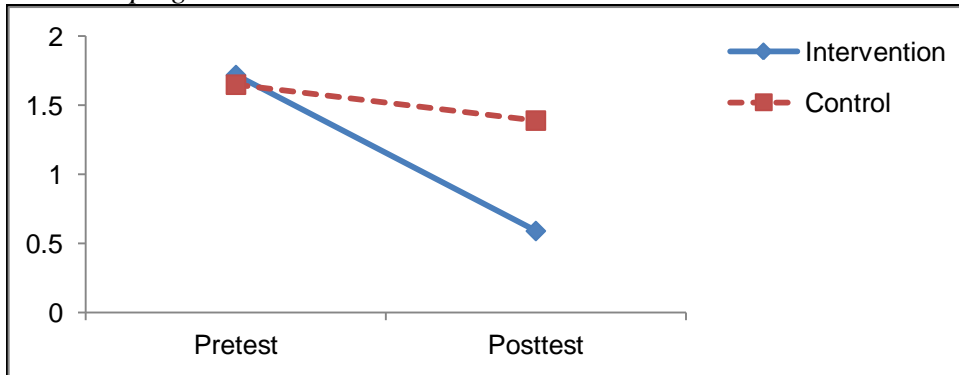


Table 32. Pretest-Posttest Differences Between Intervention and Waitlist-Control Groups for Active Coping

Time	Int.		WL		<i>df</i>	<i>t</i>	<i>p</i>	Cohen's <i>d</i>	Effect Size <i>r</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>					
Pre	1.78	0.97	1.83	0.90	50	-.206	.838	-.058	.029
Post	0.61	0.95	1.33	1.20	50	-2.40*	.020	-.679	.321

Note. * $p < .05$.

Figure 10 displays mean scores for planning coping by treatment condition over time. The interaction effect of time by treatment condition was significant, $F(1, 48) = 7.14, p = .010$, partial eta-squared = .129. In addition, the simple effect for time was significant, $F(1, 48) = 7.917, p = .007$, partial eta-squared = .142; however, the simple effect for treatment condition was not significant, $F(1, 48) = 2.599, p = .113$, partial eta-squared = .051. The figure demonstrates a reduction in planning coping for both the intervention and waitlist control group from pretest to posttest. Independent t-test results, outlined in table 33 below, indicated no group differences at pretest; however the two groups' planning coping scores were significantly different at posttest, and the effect size was small.

Figure 10

Planning Coping Scores over Time

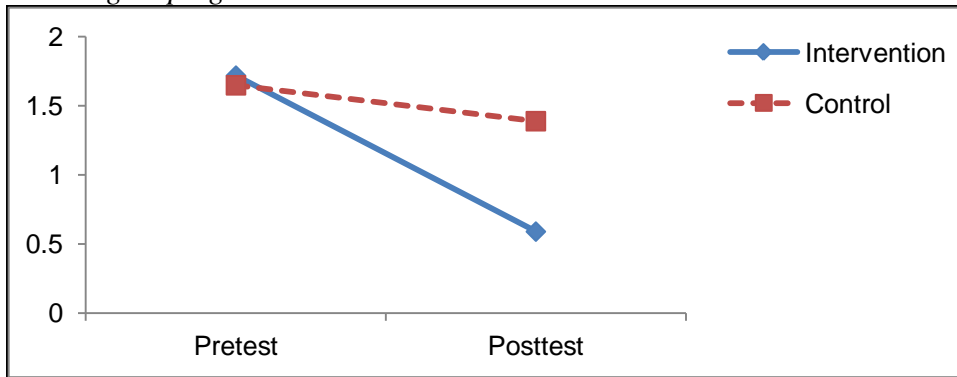


Table 33. Pretest-Posttest Differences Between Intervention and Waitlist-Control Groups for Planning Coping Scores

Time	Int.		WL		df	t	p	Cohen's d	Effect Size -r
	M	SD	M	SD					
Pre	1.72	1.21	1.65	1.14	50	.220	.826	.062	.031
Post	0.59	0.94	1.39	1.24	50	-2.62*	.012	-.741	.347

Note. * $p < .05$.

Figure 11 displays mean scores for the coping subscale religion. The interaction effect of time by treatment condition was significant, $F(1, 48) = 4.49, p = .040$, partial eta-squared = .085. The simple effects for time ($F(1, 48) = .065, p = .799$, partial eta-squared = .001) and treatment condition ($F(1, 48) = .028, p = .867$, partial eta-squared = .001) were not significant. The figure demonstrates a decrease in the use of religion as a coping strategy for the intervention group, while it also displays an increase in religious coping for the waitlist-control group. Independent t-test results, outlined in table 34 below, indicated no group differences at pretest or posttest.

Figure 11

Religion Coping Scores over Time

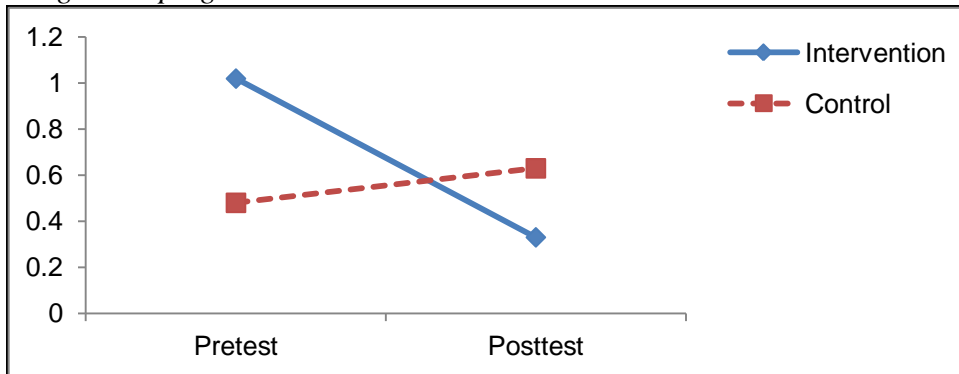


Table 34. Pretest-Posttest Differences Between Intervention and Waitlist-Control Groups for Religion Coping Scores

Time	Int.		WL		df	t	p	Cohen's d	Effect Size -r
	M	SD	M	SD					
Pre	1.02	1.19	0.48	0.91	50	1.842	.071	.521	.252
Post	0.33	0.76	0.63	1.05	50	-1.184	.242	-.335	.165

Figure 12 displays mean scores for emotional support coping by treatment condition over time. The interaction effect of time by treatment condition was significant, $F(1, 48) = 5.32, p = .025$, partial eta-squared = .100. The simple effect for time was significant, $F(1, 48) = 5.206, p = .027$, partial eta-squared = .098; however, the simple effect for treatment group was not significant, $F(1, 48) = .019, p = .892$, partial eta-squared < .001. The figure demonstrates a decrease in the use of emotional support as a coping strategy for the intervention group, while displaying relatively no change for the control group. Independent t-test results, outlined in table 35 below, indicated no group differences at pretest or posttest.

Figure 12

Emotional Support Coping Scores over Time

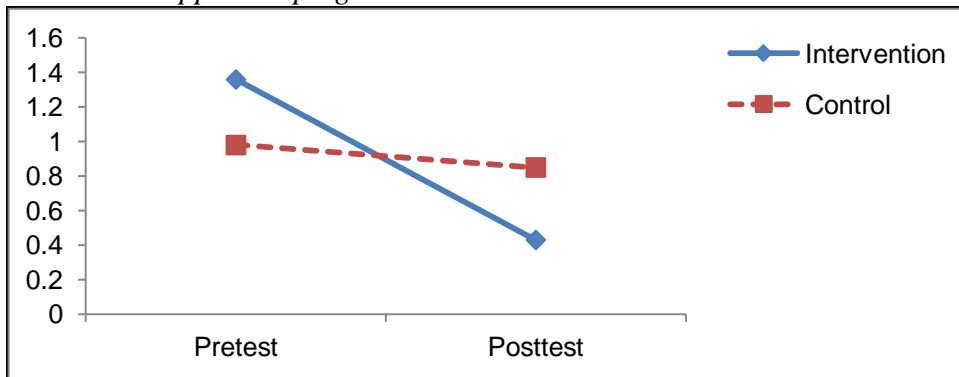


Table 35. Pretest-Posttest Differences Between Intervention and Waitlist-Control Groups for Emotional Support Coping Scores

Time	Int.		WL		df	t	p	Cohen's d	Effect Size -r
	M	SD	M	SD					
Pre	1.36	1.05	0.98	1.13	50	1.250	.217	.353	.174
Post	0.43	0.77	0.85	0.90	50	-1.788	.080	-.506	.245

Figure 13 displays self-blame coping scores by treatment condition over time. The interaction effect of time by treatment condition was significant, $F(1, 48) = 6.21, p = .016$, partial eta-squared = .115. The simple effects for time ($F(1, 48) = 1.302, p = .260$, partial eta-squared = .026) and treatment group ($F(1, 48) = 1.580, p = .215$, partial eta-squared = .032) were not significant. The figure demonstrates a decrease in self-blame for the intervention group, while displaying relatively no change for the control group, from pretest to posttest. Independent t-test results, outlined in table 36 below, indicated no group differences at pretest; however, there were significant differences between the intervention and waitlist control group at posttest, with small effect sizes indicated.

Figure 13

Self-Blame Coping Scores over Time

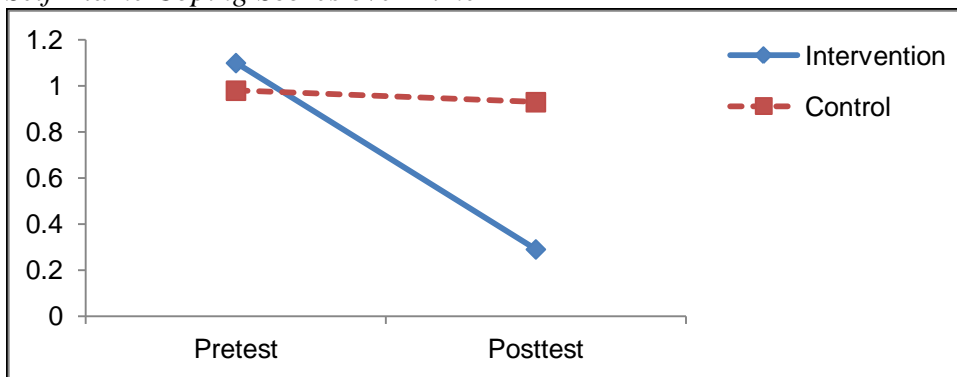


Table 36. Pretest-Posttest Differences Between Intervention and Waitlist-Control Groups for Self-Blame Coping Scores

Time	Int.		WL		df	t	p	Cohen's d	Effect Size -r
	M	SD	M	SD					
Pre	1.10	0.97	0.98	1.12	50	.406	.686	.115	.057
Post	0.29	0.51	0.93	1.01	50	-2.839	.007**	-.803	.373

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

CHAPTER IV

DISCUSSION

The present study sought to examine the effectiveness of an alcohol-focused intervention for mandated students engaged in high-risk drinking behaviors. To this researcher's knowledge, the present study is the first to test the efficacy of the *Brief Alcohol Screening for College Students* (aka "BASICS") in a small group setting. The current findings extend past literature by exploring the widely researched *BASICS* intervention implemented for mandated students in a small group setting, thus potentially expanding the resources for prevention and intervention efforts in colleges and universities. Overall, definitive determinations on the efficacy of the *BASICS* intervention when administered in a small group format cannot be made, due primarily to small samples sizes and recruitment problems that may have impacted the findings.

The primary purpose of the study was to evaluate the effectiveness of *BASICS* on reducing substance use and related risk factors (e.g., alcohol use, marijuana use, typical BAC, peak BAC, hazardous drinking, alcohol consequences, risky sexual behavior, and depression and anxiety). Four separate repeated measures analyses of covariance were conducted including: (1) Substance use and related risk factors with covariates (alcohol use and alcohol consequences); (2) Substance use and related risk factors without covariates (alcohol use and alcohol consequences); (3) Substance use and related risk factors with marijuana use as an additional between-subjects factor with covariates (alcohol use, alcohol consequences, and marijuana use); and (4) Substance use and related risk factors with marijuana use as an additional between-subjects factor without covariates (alcohol use and alcohol consequences). The secondary purpose of this study

was to explore the effectiveness of *BASICS* on increasing pro-social change behaviors and coping. Three additional multivariate analyses were conducted: (5) Harm reduction, readiness for change, and student engagement with covariates (alcohol use and alcohol consequences); (6) Harm reduction, readiness for change, and student engagement without covariates (alcohol use and alcohol consequences); and (7) Coping behaviors with covariates (alcohol use and alcohol consequences).

Intervention Effects on Substance Use and Related Risk Factors

The first RM-MANCOVA (Substance use and related risk factors with covariates alcohol use and alcohol consequences) demonstrated a significant simple effect for time on the hazardous drinking measures; however, the result was not in predicted direction. Both intervention and waitlist-control groups reported statistically significant increased hazardous drinking scores from pretest to posttest. This finding does not support the study's hypothesis, as the *BASICS* intervention does not demonstrate effectiveness at reducing hazardous drinking.

The second analysis examined the primary substance use and related risk factors without controlling for baseline alcohol use and alcohol consequences. This RM-MANOVA demonstrated three significant univariate analyses for "Time" on alcohol use, marijuana use, and alcohol consequences. From pre to post-test, participants reported a reduction in alcohol use, marijuana use, and alcohol related consequences. Follow-up independent samples t-test on alcohol use and alcohol consequences measures confirmed that despite unequal variance at baseline, differences between intervention and waitlist-control groups were not statistically significant, and the magnitude of the effects were small (effect-size r .260, .223).

Interpreting the results of the previous two analyses on substance use and related risk factors that controlled and allowed for baseline differences on alcohol use and alcohol consequences suggested that participating in the *BASICS* intervention may have facilitated changes in alcohol use frequency but not alcohol use quantity. The significant reduction in alcohol use, marijuana use, and alcohol consequences suggest that students report less frequent engagement with substance use behaviors (e.g., number of days engaging in substance use) and fewer consequences associated with their use; however, the rise in hazardous drinking (when controlling for pretest alcohol use and alcohol consequences) and non-significant results for measures of typical blood alcohol concentration and peak blood alcohol concentration suggest that when students drink, they continue to drink in a risky manner (e.g., high number of drinks per hour and number of hours drinking).

It is also important to further examine the rates of hazardous drinking endorsed by participants. Scores at or above 8.0 on the AUDIT are associated with hazardous drinking (Saunders et al., 1993). Interpretation of the mean scores demonstrated by participants (ranged from 6.52 to 8.20) indicates some risk of hazardous drinking, but do not clearly reflect hazardous drinking concerns. In addition, when controlling for baseline alcohol use and alcohol consequences, the *BASICS* intervention is efficacious at reducing drinking frequency, consequences associated with drinking, and marijuana use. These findings are consistent with results of prior alcohol-focused intervention studies among first year students, which support the use of manualized interventions for mandated students (Dimeff et al., 1999; Carey, Scott-Sheldon, Carey, & DeMartini, 2007).

Intervention Effects on Substance Use and Related Risk Factors with Marijuana Condition

Although the *BASICS* intervention was designed to address risk-factors associated with alcohol use behaviors, the questionnaire also captures marijuana use behaviors. Given that over 50% of the final sample endorsed marijuana use during the course of the study, a third set of analyses examined substance use and related risk factors with marijuana use as an additional between-subjects factor with covariates (alcohol use, alcohol consequences, and marijuana use). This approach yielded no significant results for main effects, simple effects, or univariate effects across time, treatment condition, and marijuana condition. Incorporating previous rationale to allow for baseline difference on alcohol use and alcohol consequences (as the observed differences were small in magnitude), a fourth RM MANOVA was examined for follow-up.

The fourth multivariate analysis examined substance use and related risk factors with marijuana use as an additional between-subjects factor without covariates (alcohol use and alcohol consequences). A significant main effect for time emerged. Post-hoc univariate analyses demonstrated significant simple effects for time (hazardous drinking and alcohol consequences), marijuana condition (alcohol use, hazardous drinking, alcohol consequences, and risky sexual behavior), and the interaction of time by treatment condition by marijuana condition (peak BAC and alcohol consequences); however, there were no significant findings by treatment condition.

Turning attention to univariate effects on marijuana condition, the significant findings reveal that at baseline, marijuana users endorse higher rates of alcohol use, scored higher on the hazardous drinking measure, reported more alcohol related

consequences, and scored higher on the risky sexual behavior measure than their non-marijuana using peers. In addition, all participants demonstrated a significant reduction in alcohol related consequences from pre- to post-test. These findings are consistent with extant literature which has demonstrated increased risk factors for poly-substance users. In addition, the reduction of substance use and related risk factors for marijuana users reflects the secondary effects of brief alcohol interventions on marijuana use (Magill, Barnett, Apodaca, Rohsenow, & Monti, 2009).

Intervention Effects on Pro-Social Change Factors

The secondary purpose of the study sought to examine the efficacy of *BASICS* on pro-social change factors, measured by readiness for change, harm reduction, and student engagement. Multivariate analyses were conducted with and without pretest alcohol use and alcohol consequences as covariates. Unfortunately, the two models yielded no significant interaction effects, main effects for time or condition, or univariate simple effects across the three pro-social change factors. Findings show that participation in the *BASICS* intervention had no significant impact on pro-social change behaviors for either intervention or waitlist control groups from pretest to posttest, even when allowing baseline differences for alcohol use and alcohol consequences.

The primary author anticipated that faster participation in the *BASICS* intervention would capture students' motivation for change for the intervention group compared to their waitlisted peers; however, the nature of mandated counseling contradicts some underlying principles of motivation to change. Further interpretation of the mean scores for intervention and waitlist-control group from pretest to posttest on the readiness for change measure (means ranged from 3.64 to 4.17) indicate that participants were in a

“pre-contemplation” stage of change. The pre-contemplation stage is the first stage of change in the transtheoretical model of change and is characterized by individuals who do not consider their behavior to be a problem or are attached to positive expectancies associated with their behavior (Prochaska et al., 1992). The attempt to intervene with a student population that demonstrates minimal motivation to change would likely encounter difficulty. In addition, non-significant results on the student engagement measure are consistent with extant literature which suggests that students engaged in high-risk are less engaged academically, tended to have lower student-faculty interaction, and spent less time on academics (Porter & Pryor, 2007). Although there was no significant change in the endorsement of harm-reduction behaviors, on average students reported high use of harm-reduction behaviors (mean scores ranged from 24.46 to 25.22 on a scale up to 36). Engagement with harm-reduction strategies may be best reflected in the significant reduction of alcohol-related consequences over time.

Intervention Effects on Coping Subscales

Coping behaviors, measured by fourteen subscales on the Brief Cope measure (Carver, 1997), were examined through a RM-MANCOVA with time (pretest, posttest) representing the within-subjects factor, treatment condition (intervention, waitlist-control) representing the between-subjects factor, and pretests scores for alcohol use and alcohol consequences as covariates. The interaction between time and treatment condition was significant. Main effects for time and treatment condition were also significant. There was significant main effect of the pretest covariate alcohol use. In addition, there were several significant univariate interaction effects for time and treatment condition (i.e., active, planning, religion, emotional-support, and self-blame).

Results on the coping subscales suggest that both intervention and waitlist-control groups report less coping behaviors at posttest (please refer to table 23).

Simple effects for time by intervention condition were significant for five coping subscales (i.e., active, planning, religion, emotional-support, and self-blame). Although statistically significant, these findings were not in the predicted direction. Participants in the *BASICS* intervention endorsed fewer coping behaviors from pretest to posttest. A possible interpretation of this finding could be that participants no longer experienced stress surrounding their sanction following completion of the required intervention.

Clinical Implications

The present study's findings may add to a growing body of literature on prevention and intervention efforts for high risk alcohol use behaviors among mandated college students. Manualized substance-related interventions have traditionally been delivered in one-on-one formats; however method may be an inefficient use of resources and limit the number and types of students served. Although aspects of this study have been explored in separate parts (e.g., manualized treatment, group motivational enhancements, and mandated students) this is the first examination of the widely researched *BASICS* intervention administered in a small group setting for mandated students. There are many limitations to this study and most impactful includes the small sample size and the homogenous sample acquired. Due to sampling concerns, definitive critiques and the validity of the findings should be interpreted with caution.

From a service delivery perspective, the findings of this study suggest that the *BASICS* intervention can be implemented in a broader range of settings (outside of one-on-one interventions) including small group workshops offered through the counseling or

university health centers; however, this practice requires future outcome analyses to determine if the *BASICS* intervention remains true to its original form when administered in alternate formats. The service delivery benefits administering *BASICS* in small groups may compromise other critical aspects of the program (e.g., motivational interviewing techniques or harm reduction efforts). While this study identified some effective components to the intervention (e.g., reduction in alcohol use, marijuana use, and alcohol consequences), when implemented in a group setting, *BASICS* may not effectively address high risk substance use behaviors (e.g., blood alcohol concentration), nor increase motivation to change or support the development of healthy coping strategies. Overall, by expanding the productivity of substance abuse prevention and intervention programming through the use of small groups, the quality of *BASICS* may be placed into question. Future analyses may benefit from comparing *BASICS* in its original one-on-one style to the small group format.

Some potential reasons that *BASICS* appears to be less effective in small group settings could be related to the structure of the groups. A critical aspect of effective substance abuse prevention-intervention group therapy involves group composition. Group members play a critical role for one another, and they have the unique ability to challenge others' biases, dispel myths, and reinforce pro-social behaviors; however, if a group is composed of a large number of high-risk substances users they may collude with each other, and the group can have iatrogenic effects for low-risk participants (Dishion & Stormshak, 2007; Poulin, Dishion, & Burraston, 2001). While the sample demonstrated fairly equal group composition for low-risk (i.e., typical blood alcohol concentration below .08), high risk (i.e., typical blood alcohol concentration above .08), non-marijuana,

and marijuana using participants, the individual composition of the bi-weekly *BASICS* intervention groups may not have the same distribution. Other group dynamics (e.g., peer expectations, maturity, or glorification of high risk drinking behaviors) may create “noise” in the group setting and prevent participants from benefitting from the intervention. A possible way to address this concern might be to set parameters for the proportion of high-risk versus low-risk participants in each group.

In addition, findings from this study also reflect the compounded risk factors for poly-substance use, as students who endorsed marijuana use had higher baseline rates of alcohol use, hazardous drinking, alcohol-related consequences, and risky sexual behaviors. Although the *BASICS* intervention demonstrated secondary effects for students engaged in poly-substance use, findings also demonstrate a need for intervention efforts designed specifically for marijuana use or poly-substance use behaviors. Additional intervention components could provide psycho-education on marijuana, explore marijuana-related expectancies and motivation for use, and identify harm-reduction strategies to promote change with marijuana use behaviors.

Limitations

There are several important limitations that should be noted when interpreting the findings of this study. Primarily, the study had a limited sample, and as a result, sufficient power required to detect the intervention effects through the outcome variable were low. By increasing the sample size, there is a potential that significant findings would have emerged on some variables of interest. Secondly, the data was significantly skewed, and thus violated assumptions of normality. In addition, the sample ethnicity was largely Euro-American first-year college students, which may limit the degree to which the

results can be generalized to more ethnically diverse students and different student populations.

Although participants were randomized into intervention and control groups, there was a potential for selection bias in the consent process given that participants were informed of the time commitment and compensation. Other viable participants may not have been motivated by the study's compensation efforts (i.e., \$10 for completing the surveys with a chance to win the grand prize valued up to \$200). In addition, it is common for mandated students to demonstrate some resistance to treatment, and these sentiments may have influenced their willingness to participate in the study. Another factor surrounds motivation to change. The majority of participants were in a "pre-contemplative" stage of change. Future research may benefit from incorporating more sensitive measurement instruments to detect more subtle movement across the stages of change.

There were also possible research design issues that may have influenced the study. All students who were mandated to complete the *BASICS* intervention were invited to participate in the study, and those that elected to participate were randomized to one of two treatment groups; however, there is a potential for unobserved effects between the point of sanction and the point of study participation. It is unknown when the participants were originally cited for their violation, the duration of time that may have lapsed between their citation and sanction hearing, and any further delay between receiving their sanction notification and completing the questionnaire. Although the study attempted to control for factors using a randomized waitlist-control experimental design, it is possible

that there was a greater delay between the point of citation and entry into the study which could affect both the intervention and waitlist-control groups.

Although extant literature has identified first year college students as a vulnerable population for high risk drinking behaviors, continued efforts need to be made to cast a wider net to reach other students who may also be at risk (Barnett & Read, 2005). This sample mostly included first-year college students of Euro-American decent who resided in university housing. More efforts need to be made to examine the impact of substance use concerns among students who live off campus, who may be of the legal drinking age, and who come from diverse backgrounds (e.g., ethnic backgrounds, cultural groups, gender and sexual orientation identity, international students, first-generation college students, disability status etc.). In addition, every university maintains a unique campus climate, and research may also benefit from incorporating qualitative information on students' experiences, expectations, and attitudes surrounding the culture of alcohol and other drug use within the campus community. Research efforts to improve multicultural perspectives among high risk substance use behaviors for college students may provide more information on effective prevention and intervention efforts.

Finally, this study highlighted the increased risk-factors among poly-substance users. Additional efforts including research, prevention, and intervention need to be directed towards this population. Poly-substance users may benefit from a higher-tiered intervention, given the presence of risk factors. In addition, prevention and intervention efforts should include psycho-education specific to poly-substance use (e.g., alcohol and marijuana).

Future Directions

With consideration to the clinical implications and study limitations previously addressed, there are several areas where future research can expand on the present findings. Because this study suggested that manualized alcohol-focused interventions, specifically *BASICS*, may not be efficacious for reducing substance-related risk factors when administered in small group settings, these findings have important implications for research. Most importantly, given that this was the first study to test the effectiveness of administering *BASICS* in a small group setting, it is necessary that the findings be replicated to garner additional empirical perspectives. Although the study hypotheses were not confirmed, the findings could be useful to inform future avenues of research. For example, the inclusion of a larger sample size and more extended longitudinal design would help to clarify if the outcome measures demonstrate statistical significance across time. In addition, the *BASICS* intervention is currently implemented at a number of colleges and universities across the country, and the possibility to pool research data from a larger network could be one method of creating a larger sample size.

Future studies are also needed to assess the extent to which the intervention effects are sustained over a longer period of time, given that the follow-up period for the current study only spanned two weeks. Furthermore, future studies should consider including additional treatment conditions, such as assessment only, along with intervention and waitlist-control conditions. The examination of additional treatment conditions could further demonstrate the efficacy of *BASICS* and demonstrate if there is a potential “window of opportunity” to capitalize on motivation and readiness for change. Another future consideration surrounds measurement and inclusion of more sensitive

instruments to detect changes in substance-related risk factors and pro-social change behaviors. Additionally, future studies could help clarify the unanticipated outcomes on the coping measure examined in the current study. Finally, replication of the findings with a more diverse student population is also needed.

The findings of this study demonstrate secondary effects for students engaged with marijuana use in addition to alcohol use. Although some aspects of the intervention proved efficacious on features of substance use and related risk factors for both alcohol-only and poly-substance users, results indicated that students engaged in poly-substance use had higher baseline substance use and related risk factors. Additional research on methods to address poly-substance use in the mandated college-student population is needed. In summary, the current study reaffirmed extant literature surrounding challenges with substance use interventions for mandated students; however, interpretations of the findings are to be exercised with caution due to sampling limitations. This study highlighted the need for additional intervention efforts for students engaged in poly-substance use and for students of diverse backgrounds who may also be at-risk for alcohol and other drug related concerns.

APPENDIX A

INSTITUTIONAL REVIEW BOARD APPROVAL LETTER

Research Compliance Services

University of Oregon Institutional Review Board

DATE: April 10, 2012 **IRB Protocol Number: 02062012.010**

TO: LaMisha Hill, Principal Investigator
Department of Education

RE: Protocol entitled, "Evaluating the Brief Alcohol Screening Intervention for College Students (BASICS) in Small Group Settings for Mandated College Students Engaged in High-Risk Drinking "

Notice of IRB Review and Approval

Expedited Review as per Title 45 CFR Part 46.110, 63 FR 60366, # 6, 7

The project identified above has been reviewed by the University of Oregon Institutional Review

Board (IRB) and Research Compliance Services using an expedited review procedure.

This is a

minimal risk study. This approval is based on the assumption that the materials, including changes/clarifications that you submitted to the IRB contain a complete and accurate description of all the ways in which human subjects are involved in your research.

This approval is given with the following standard conditions:

1. You are approved to conduct this research only during the period of approval cited below;
2. You will conduct the research according to the plans and protocol submitted (approved copy enclosed);
3. You will immediately inform Research Compliance Services of any injuries or adverse research events involving subjects;
4. You will immediately request approval from the IRB of any proposed changes in your research, and you will not initiate any changes until they have been reviewed and approved by the IRB;
5. You will only use the informed consent documents that have the IRB approval dates stamped on them (approved copies enclosed);
6. You will give each research subject a copy of the informed consent document;

7. If your research is anticipated to continue beyond the IRB approval dates, you must submit a Continuing Review Request to the IRB approximately 60 days prior to the IRB approval expiration date. Without continuing approval the Protocol will automatically expire on April 09, 2013.

Additional Conditions: *Any research personnel that have not completed CITI certificates should be removed from the project until they have completed the training. When they have completed the training, you must submit a Protocol Amendment Application Form to add their names to the protocol, along with a copy of their CITI certificates.*

Approval Period: April 10, 2012 - April 09, 2013

The University of Oregon and Research Compliance Services appreciate your efforts to conduct research in compliance with University of Oregon Policy and federal regulations that have been established to ensure the protection of human subjects in research. Thank you for your cooperation with the IRB process.

Sincerely,

Deborah Olson, PhD
IRB Chair
Committee for the Protection of Human Subjects - FWA 00005914
University of Oregon

CC: Elizabeth Stormshak, Faculty Advisor

COMMITTEE FOR THE PROTECTION OF HUMAN SUBJECTS • RESEARCH
COMPLIANCE SERVICES
1600 Millrace Drive, Suite 105, 5237 University of Oregon, Eugene OR 97401-5237
T 541-346-2510 F 541-346-6224 <http://humansubjects.uoregon.edu>
An equal-opportunity, affirmative-action institution committed to cultural diversity and compliance with the Americans with Disabilities Act

APPENDIX B

INSTITUTIONAL REVIEW BOARD CONTINUATION APPROVAL

DATE: March 22, 2013 **IRB Protocol Number: 02062012.010**

TO: LaMisha Hill, Principal Investigator
Department of Counseling Psychology

RE: Protocol entitled, "Evaluating the Brief Alcohol Screening Intervention for College Students (BASICS) in Small Group Settings for Mandated College Students Engaged in High-Risk Drinking"

Notice of IRB Review and Approval-Continuing Review

Expedited Review as per Title 45 CFR Part 46.110, 63 FR 60366, # 7

The continuation of the project identified above has been reviewed by the University of Oregon Institutional Review Board (IRB) and Research Compliance Services using an expedited review procedure. This is a minimal risk study. This approval is based on the assumption that the materials, including changes/clarifications that you submitted to the IRB contain a complete and accurate description of all the ways in which human subjects are involved in your research.

The following additional determinations have been made:

1. The IRB has waived documentation of informed consent under 45 CFR 46.117 (c)(2). The research presents no more than minimal risk of harm to subjects and involves no procedures for which written consent is normally required outside of the research context.

This approval is given with the following standard conditions:

1. You are approved to conduct this research only during the period of approval cited below;
2. You will conduct the research according to the plans and protocol submitted (approved copy enclosed);
3. You will immediately inform Research Compliance Services of any injuries or adverse research events involving subjects;
4. You will immediately request approval from the IRB of any proposed changes in your research, and you will not initiate any changes until they have been reviewed and approved by the IRB;
5. You will only use the informed consent documents that have the IRB approval dates stamped on them (approved copies enclosed);
6. You will give each research subject a copy of the informed consent document;

7. If your research is anticipated to continue beyond the IRB approval dates, you must submit a Continuing Review Request to the IRB approximately 60 days prior to the IRB approval expiration date. Without continuing approval the Protocol will automatically expire on March 21, 2014.

Additional Conditions: *Any research personnel that have not completed CITI certificates should be removed from the project until they have completed the training. When they have completed the training, you must submit a Protocol Amendment Application Form to add their names to the protocol, along with a copy of their CITI certificates.*

Approval period: March 22, 2013 - March 21, 2014

The University of Oregon and Research Compliance Services appreciate your efforts to conduct research in compliance with University of Oregon Policy and federal regulations that have been established to ensure the protection of human subjects in research. Thank you for your cooperation with the IRB process.

Sincerely,
Deborah Olson, PhD
IRB Chair
Committee for the Protection of Human Subjects - FWA 00005914
University of Oregon

CC: Elizabeth Stormshak, Faculty Advisor

COMMITTEE FOR THE PROTECTION OF HUMAN SUBJECTS • RESEARCH COMPLIANCE SERVICES

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APPENDIX C

STUDY ADVERTISEMENT

Study Advertisement for Participation as a Subject in the Dissertation: Evaluating the Brief Alcohol Screening Intervention for College Students (*BASICS*) in Small Group Settings for Mandated College Students Engaged in High-Risk Drinking

Hello,

My name is LaMisha Hill and I am a doctoral student from the Counseling Psychology Department at the University of Oregon. I am writing to invite you to participate in my research study about an intervention on alcohol use. You're eligible to be in this study because you are required to complete *BASICS*. I obtained your contact information from the Office of Student Conduct and Community Standards/ Office of Student Housing.

If you decide to participate in this study, you will complete 3 brief surveys over 2 months. I am also requesting your permission to access your GPA and student conduct records, and video recordings that may be taken of you during the *BASICS* intervention. You will receive one \$10 gift card (e.g. UO Campus Cash, Regal Movie electronic gift-card, or Starbucks electronic gift-card) for every survey completed. That's a total of \$30 for participating in the study. In addition, if you complete all three surveys you will be eligible for the grand prize drawing worth over \$200 (Solo Beats by Dr. Dre Headphones or a \$200 Gift Card)!

You should know that participants will be asked questions about illegal drug use (or, if they are under 21, illegal alcohol use), and as such they may skip any questions they are not comfortable answering. Random *BASICS* interventions are recorded and observed for fidelity purposes. Any such recordings accessed and reviewed by the primary investigator and will be deleted within a month.

Although you are required to complete the *BASICS* sanction, participation in this research study is completely voluntary. All information you provide as a participant will remain confidential and no identifying information will ever be used. You can choose to be in the study or not, but I would really appreciate your help in providing the University with information that will best serve students like yourself.

In addition, please feel free to email or contact me at lhill2@uoregon.edu with any questions or concerns. Thank you very much.

Sincerely,

LaMisha Hill

APPENDIX D

INFORMED CONSENT

University of Oregon Counseling Psychology

Informed Consent for Participation as a Subject in the Dissertation: Evaluating the Brief Alcohol Screening Intervention for College Students (*BASICS*) in Small Group Settings for Mandated College Students Engaged in High-Risk Drinking

Investigator: LaMisha Hill, M.S.

Adult Consent Form

Introduction

- You are being asked to be in a research study about an intervention on alcohol use.
- You were selected as a possible participant because you were mandated to participate in *BASICS*.
- We ask that you read this form and ask any questions that you may have before agreeing to be in the study.

Purpose of Study:

- The purpose of this study is determine if *BASICS* is effective at reducing harm associated with high-risk drinking for mandated students.
- Participants in this study are from The University of Oregon and the total number of subjects is expected to be 200.

*Please note that the responsible investigator has a significant financial interest in the completion of this dissertation study.

Description of the Study Procedures:

- If you agree to be in this study, we would ask you to do the following things:
Complete three brief surveys over 2 months. The surveys should take approximately 20 minutes and are administered online. You will be notified through email when it is time to take the next survey. You may receive a reminder email or phone call requesting that you complete the survey, if you have not done so in a timely manner.
- Additionally, the principal investigator is requesting permission to access, observe, and review video recordings that may occur as part of the *BASICS* intervention. These videos are randomly recorded and observed for fidelity purposes to ensure that *BASICS* is administered properly.
- Lastly, the principal investigator is requesting permission to access your student conduct records and University GPA.

Risks/Discomforts of Being in the Study:

- The study poses possible risks of psychological or emotional discomfort that may arise from questions asked involving behaviors or experiences surrounding past alcohol use and sexual behaviors.

- Participants will be asked questions about illegal drug use (or, if they are under 21, illegal alcohol use), and as such they may skip any questions they are not comfortable answering.

Benefits of Being in the Study:

- The purpose of the study is to determine if *BASICS* is effective at reducing high-risk drinking behaviors for mandated students.
- The benefits of participation are to reduce high-risk drinking behaviors, increase use of harm-reduction strategies, and provide students with additional resources.
- Provide the University of Oregon with information on how to better serve students.

Payments:

- You will receive the following reimbursement: \$10 gift card per survey filled out for a total of \$30 for complete participation in the Study. If you complete all three data collection points you will be eligible for a grand prize drawing worth over \$200.

Costs:

- There is no cost to you to participate in this research study.

Confidentiality:

- The records of this study will be kept private. All identifying information will be removed from survey data and participants will be issued an ID code. In any sort of report we may publish, we will not include any information that will make it possible to identify a participant. Research records will be kept in a locked file or on a secured data server.
- All electronic information will be coded and secured using a password protected file. A random number of *BASICS* Interventions will be recorded and observed by the principal investigator for fidelity purposes. These recordings will be reviewed by the principal investigator. All video recordings will be deleted from the secured server within one-month of review.
- Access to the records will be limited to the researchers; however, please note that regulatory agencies, and the Institutional Review Board and internal University of Oregon auditors may review the research records.
- Any student records such as GPA and conduct records will be gathered using student ID numbers and will not contain immediate identifying information.
- Any video recordings accessed by the investigator will be stored on a password protected secured server, and deleted within one month of review.
- Results from this study may be published or presented in national research journals.

Voluntary Participation/Withdrawal:

- Your participation is voluntary. If you choose not to participate, it will not affect your current or future relations with The University of Oregon.
- You are free to withdraw at any time, for whatever reason.
- There is no penalty or loss of benefits for not taking part or for stopping your participation. Withdrawal does not jeopardize grades or risk loss of present or future

faculty or University relationships.

Dismissal From the Study:

- The investigator may withdraw you from the study at any time for the following reasons: (1) withdrawal is in your best interests (e.g. side effects or distress have resulted), (2) you have failed to comply with the study requirements, or (3) the study sponsor decides to terminate the study.

Contacts and Questions:

- The researcher conducting this study is LaMisha Hill. For questions or more information concerning this research you may contact her at lhill2@uoregon.edu
- If you have any questions about your rights as a research subject, you may contact: the Office for Protection of Human Subjects, University of Oregon at (541-346-2510) or human_subjects@uoregon.edu

Copy of Consent Form:

- You may print this form to keep for your records. You will also have access to this form through the online survey.

Statement of Consent:

[checkbox] I have read (or have had read to me) the contents of this consent form and have been encouraged to ask questions. I have received answers to my questions. I give my consent to participate in this study. I have received (or will receive) a copy of this form.

Permission to access video recordings:

[checkbox] In addition to participating in the survey, I grant permission to the principal investigator to access and review video recordings that may be randomly taken of me during the BASICS intervention.

Permission to access student records:

[checkbox] In addition to participating in the survey, I grant permission to the principal investigator to access and review my University study records, including GPA and student conduct records.

APPENDIX E

FOLLOW-UP EMAIL TEMPLATE FOR NEWLY ENROLLED PARTICIPANTS

Dear [*Student Name*], Thank you for participating in the College Drinking Study. Below, please find registration information for your Basics 1 Class. The classes are offered on fixed dates and times, and it is common that students might need to make arrangements in their schedules to attend. The class is held for two hours. Please arrive a few minutes early, as the facilitators take attendance and promptly close the doors at *time*.

Basics 1 Class: *Date & Time*, PM for 2.00 hours.

Location: The University Counseling Center (13th & Agate, 2nd floor above the University Health Center)

Follow-up Information to The College Drinking Study:

-Please do not contact the Counseling Center with questions or concerns related to the Study, as they only provide services for the Basics 1 class to support students in completing their sanction. If you do have questions, please contact the Study's Principal Investigator, LaMisha Hill at lhil2@uoregon.edu.

-You will receive an email confirmation of your \$10 gift for participating in the Study within the week.

-You will receive the College Drinking Study Follow-up Survey after your completion of the BASICS 1 Class.

Sincerely,

--

LaMisha Hill, M.S.
Doctoral Candidate
Counseling Psychology
The University of Oregon

APPENDIX F

STUDY COMPENSATION EMAIL TEMPLATE

Subject Line: Your Gift for Participating in the College Drinking Study

Dear UO Student, this message is to confirm the delivery of your \$10 Gift for participating in the College Drinking Study.

If you selected \$10 UO Dollars, this was added to your student ID card through the campus card office. If you feel the need to verify receipt, you will need to go into the campus card office for this information directly.

If you selected either the \$10 Starbucks e-gift or \$10 Regal Movies e-gift, you should have received a notification in your UO email. If it is not there, please check your spam-mail (You might get a message that states "End User Digest" in subject line).

If you have any questions concerning the College Drinking Study and related items please direct your questions to me directly and do not contact the counseling center, as they are not conducting the Study and only provide the services to complete your Sanction.

Thanks again for your participation, and look out for our follow-up surveys for your chance to win the grand prize, Beats by Dr. Dre Solo Headphones.

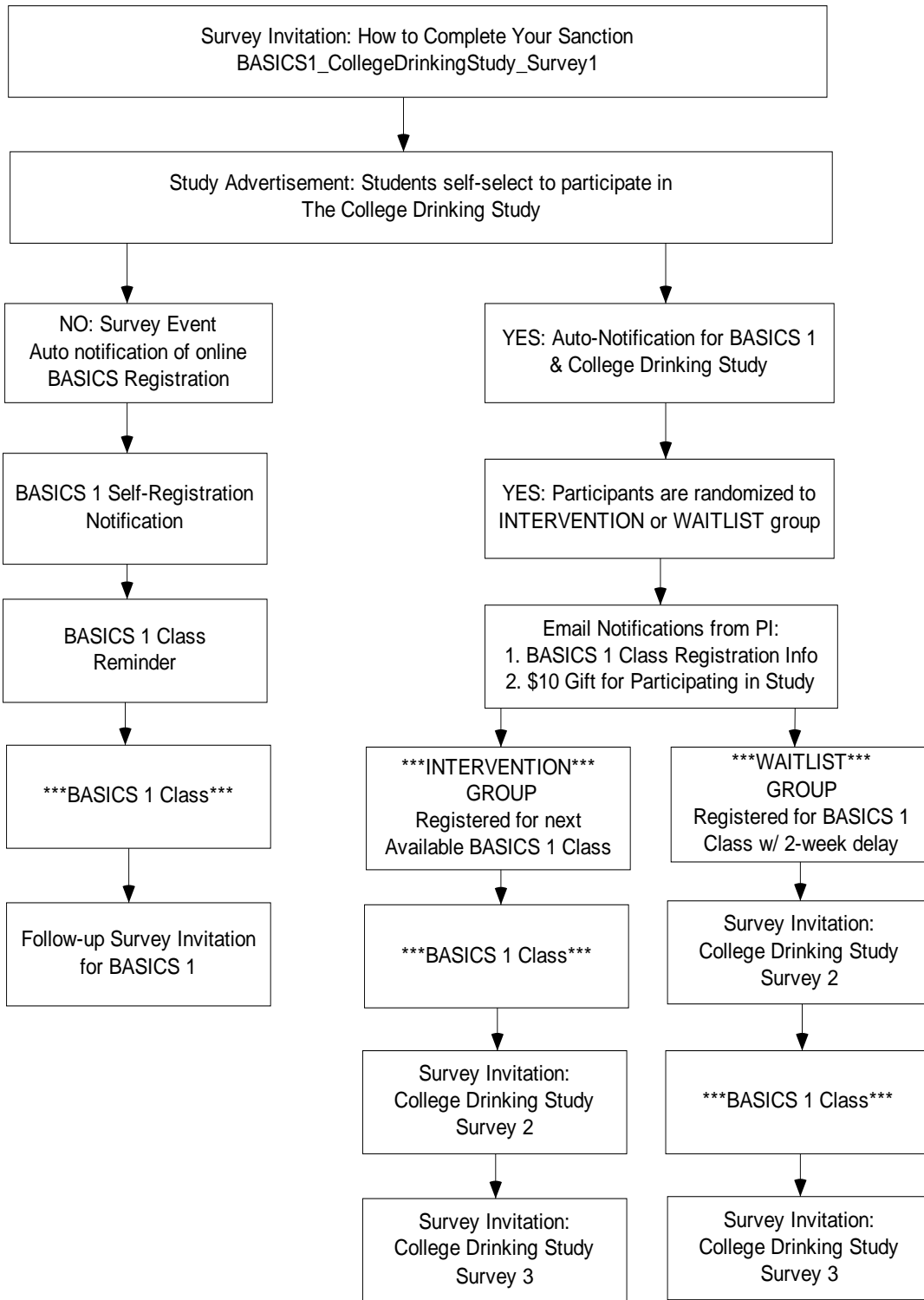
Sincerely,

--

LaMisha Hill, M.S.
Doctoral Candidate
Counseling Psychology
The University of Oregon

APPENDIX G

BASICS 1 & COLLEGE DRINKING STUDY FLOW CHART



APPENDIX H

MEMORANDUM OF UNDERSTANDING

LaMisha Hill
Counseling Psychology Program
5251 College of Education
The University of Oregon
Eugene, OR 97403
lhil2@uoregon.edu

November 4, 2011

MEMORANDUM OF UNDERSTANDING

between

LaMisha N. Hill, M.S.

and

**The University of Oregon Counseling & Testing Center, The Office of Student
Conduct &**

Community Standards, and University Housing & Residence Life

I. Purpose & Scope

The purpose of this Memorandum of Understanding (MOU) is a formal acknowledgement of communication between representatives of The University Counseling & Testing Center, Office of Conduct and Community Standards, and University Housing & Residence Life regarding LaMisha Hill's Doctoral Dissertation. This MOU will clearly identify the roles and responsibilities of each party as they relate to supporting the doctoral dissertation and outline agreed upon terms surrounding research design, participant recruitment, and projected timelines.

II. Background

The doctoral dissertation, *Evaluating the Brief Alcohol Screening for College Students (BASICS) in Small Group Settings for Mandated Students Engaged in High Risk Drinking*, will be conducted by the primary author (LaMisha Hill, M.S.). This study will examine University of Oregon students mandated to complete *BASICS* at the University of Oregon Counseling Center for violations of University alcohol policies. This study will utilize a randomized repeated measures waitlist-control design. The treatment group will complete the study's data collection prior to participating in the *BASICS* intervention, complete the second data collection point two weeks following the intervention, and complete the third data point collection after an additional four weeks. The waitlist-control group will complete the study's data collection points twice in two week regulated intervals prior to participating in the *BASICS* intervention, and complete the third data collection point four weeks following.

III. LaMisha Hill's Responsibilities Under this MOU

LaMisha Hill shall undertake the following activities:

- Submit necessary documents to Counseling Psychology department, Office for Protection of Human Subjects Institutional Review Board, and other responsibilities as they become relevant.
- Construct study's assessment battery and upload relevant documents into secured database.
- Contact mandated students sanctioned to complete the *BASICS* intervention.
- Monitor data collection completion and participant reimbursement.
- Complete treatment fidelity observations of *BASICS* intervention.
- Communicate regularly with associated parties regarding modifications to IRB and progress of the study.

IV. The University Counseling & Testing Center Responsibilities Under this MOU

- Provide *BASICS* intervention for mandated students following sanctions issued by The Office of Conduct & Community Standards and University Housing.
- Provide training for interventionist in *BASICS* administration and motivational interviewing.
- Administer *BASICS* intervention as established for the duration of the study with no significant changes to intervention structure.

V. The Office of Conduct & Community Standards and University Housing Responsibilities Under this MOU

- Issue sanctions to complete *BASICS* intervention to students who violate University Alcohol Policies in a consistent manner based on established protocol.
- Advertise the study to appropriate students to support recruitment process.
- Notify primary author regarding changes to protocol that would affect recruitment to *BASICS* intervention and study feasibility.
- Provide student participants randomized to waitlist-control group with extensions to complete *BASICS* sanction as needed depending on intervention availability.

VI. Funding

- This dissertation will be funded primarily by grants, scholarships, and personal monies attained by the primary author.
- Potential funding support available from relevant parties or knowledge of University funding will be accepted.
- Participants will be awarded \$10 for each data collection point, for a total of \$30 for completion of study.
- Potential increases in participant reimbursement will be dependent on funds secured, recruitment progress, and modifications to IRB.

VII. Effective Date & Signature

- This MOU shall be effective upon notification of receipt by The University Counseling & Testing Center, The Office of Conduct & Community Standards, and University Housing authorized officials. It shall be in force from the date of approval granted by Office for Protection of Human Subjects Institutional Review Board following any potential revisions to IRB as requested. Following IRB approval, this MOU shall remain in effect for the duration of participant recruitment.

APPENDIX I

SAMPLE INTERVENTION FIDELITY CHECKLISTS

BASICS Intervention Fidelity Observation Checklist

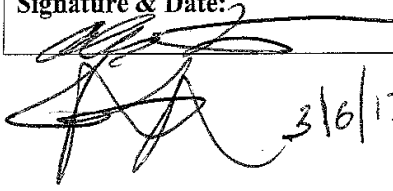
Instructions: Following the BASICS intervention, please assess whether or not you addressed the following BASICS components in your class. Use the answer key as follows: No (0) or Yes (1).

Facilitators review of:	0	1
1. Confidentiality, Consent to A/V taping, Release of Information, & Title IX		1
2. Alcohol Related Expectancies (e.g. "Pros & Cons of Drinking")		1
3. Physiological effects of Alcohol (e.g. Biphasic effect, Point of Diminishing returns, Tolerance, etc.)		1
4. Personalize Feedback Report (e.g. Alcohol quantity frequency and BAC)		1
5. Harm-Reduction Strategies		1
6. UCTC Resources		1
Signature & Date:	Total	6

[Handwritten Signature] 3/13/13
[Handwritten Signature] 3/13/13

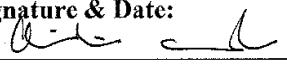
BASICS Intervention Fidelity Observation Checklist

Instructions: Following the BASICS intervention, please assess whether or not you addressed the following BASICS components in your class. Use the answer key as follows: No (0) or Yes (1).

Facilitators review of:	0	1
1. Confidentiality, Consent to A/V taping, Release of Information, & Title IX		✓
2. Alcohol Related Expectancies (e.g. "Pros & Cons of Drinking")		✓
3. Physiological effects of Alcohol (e.g. Biphasic effect, Point of Diminishing returns, Tolerance, etc.)		✓
4. Personalize Feedback Report (e.g. Alcohol quantity frequency and BAC)		✓
5. Harm-Reduction Strategies		✓
6. UCTC Resources		✓
Signature & Date:  3/6/13	Total	6

BASICS Intervention Fidelity Observation Checklist

Instructions: Following the BASICS intervention, please assess whether or not you addressed the following BASICS components in your class. Use the answer key as follows: No (0) or Yes (1).

Facilitators review of:	0	1
1. Confidentiality, Consent to A/V taping, Release of Information, & Title IX		1
2. Alcohol Related Expectancies (e.g. "Pros & Cons of Drinking")		1
3. Physiological effects of Alcohol (e.g. Biphasic effect, Point of Diminishing returns, Tolerance, etc.)		1
4. Personalize Feedback Report (e.g. Alcohol quantity frequency and BAC)		1
5. Harm-Reduction Strategies		1
6. UCTC Resources		1
Signature & Date:  3/6/13	Total	6

Christina Aranda, MS
 Carly Smith

BASICS Intervention Fidelity Observation Checklist

Instructions: Following the BASICS intervention, please assess whether or not you addressed the following BASICS components in your class. Use the answer key as follows: No (0) or Yes (1).

Facilitators review of:	0	1
1. Confidentiality, Consent to A/V taping, Release of Information, & Title IX		1
2. Alcohol Related Expectancies (e.g. "Pros & Cons of Drinking")		1
3. Physiological effects of Alcohol (e.g. Biphasic effect, Point of Diminishing returns, Tolerance, etc.)		1
4. Personalize Feedback Report (e.g. Alcohol quantity frequency and BAC)		1
5. Harm-Reduction Strategies		1
6. UCTC Resources		1
Signature & Date: <i>Charly Smith, MS</i> Total <i>2/27/13</i>		6

Charly Smith, MS 2/27/13

BASICS Intervention Fidelity Observation Checklist

Instructions: Following the BASICS intervention, please assess whether or not you addressed the following BASICS components in your class. Use the answer key as follows: No (0) or Yes (1).

Facilitators review of:	0	1
1. Confidentiality, Consent to A/V taping, Release of Information, & Title IX		✓
2. Alcohol Related Expectancies (e.g. "Pros & Cons of Drinking")		✓
3. Physiological effects of Alcohol (e.g. Biphasic effect, Point of Diminishing returns, Tolerance, etc.)		✓
4. Personalize Feedback Report (e.g. Alcohol quantity frequency and BAC)		✓
5. Harm-Reduction Strategies		✓
6. UCTC Resources		✓
Signature & Date:	Total	
<i>Ellen J. MA 2-26-13</i>		

BASICS Intervention Fidelity Observation Checklist

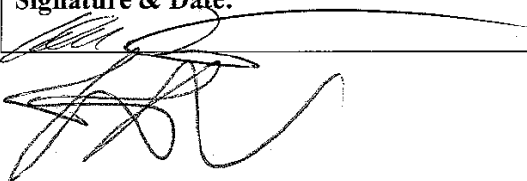
Instructions: Following the BASICS intervention, please assess whether or not you addressed the following BASICS components in your class. Use the answer key as follows: No (0) or Yes (1).

Facilitators review of:	0	1
1. Confidentiality, Consent to A/V taping, Release of Information, & Title IX		✓
2. Alcohol Related Expectancies (e.g. "Pros & Cons of Drinking")		✓
3. Physiological effects of Alcohol (e.g. Biphasic effect, Point of Diminishing returns, Tolerance, etc.)		✓
4. Personalize Feedback Report (e.g. Alcohol quantity frequency and BAC)		✓
5. Harm-Reduction Strategies		✓
6. UCTC Resources		✓
Signature & Date: <i>Cary Smith 2/13/13</i> Total		6

* Two participants today;
 both marijuana-focused;
 Harm reduction focused on
 marijuana.

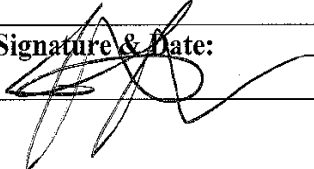
BASICS Intervention Fidelity Observation Checklist

Instructions: Following the BASICS intervention, please assess whether or not you addressed the following BASICS components in your class. Use the answer key as follows: No (0) or Yes (1).

Facilitators review of:	0	1
1. Confidentiality, Consent to A/V taping, Release of Information, & Title IX		1
2. Alcohol Related Expectancies (e.g. "Pros & Cons of Drinking")		1
3. Physiological effects of Alcohol (e.g. Biphasic effect, Point of Diminishing returns, Tolerance, etc.)		1
4. Personalize Feedback Report (e.g. Alcohol quantity frequency and BAC)		1
5. Harm-Reduction Strategies		1
6. UCTC Resources		1
Signature & Date: 	Total 2-19-13	

BASICS Intervention Fidelity Observation Checklist

Instructions: Following the BASICS intervention, please assess whether or not you addressed the following BASICS components in your class. Use the answer key as follows: No (0) or Yes (1).

Facilitators review of:	0	1
1. Confidentiality, Consent to A/V taping, Release of Information, & Title IX		✓
2. Alcohol Related Expectancies (e.g. "Pros & Cons of Drinking")		✓
3. Physiological effects of Alcohol (e.g. Biphasic effect, Point of Diminishing returns, Tolerance, etc.)		✓
4. Personalize Feedback Report (e.g. Alcohol quantity frequency and BAC)		✓
5. Harm-Reduction Strategies		✓
6. UCTC Resources		✓
Signature & Date:  2/12/13	Total	

BASICS Intervention Fidelity Observation Checklist

Instructions: Following the BASICS intervention, please assess whether or not you addressed the following BASICS components in your class. Use the answer key as follows: No (0) or Yes (1).

Facilitators review of:	0	1
1. Confidentiality, Consent to A/V taping, Release of Information, & Title IX		✓
2. Alcohol Related Expectancies (e.g. "Pros & Cons of Drinking")		✓
3. Physiological effects of Alcohol (e.g. Biphasic effect, Point of Diminishing returns, Tolerance, etc.)		✓
4. Personalize Feedback Report (e.g. Alcohol quantity frequency and BAC)		✓
5. Harm-Reduction Strategies		✓
6. UCTC Resources		✓
Signature & Date: <i>[Signature]</i> 2-12-12	Total	6

APPENDIX J

MEASURES

Demographic Questionnaire

Instructions: Please complete the following questions by providing an answer in the appropriate text box or selecting an option that most accurately captures your experience.

1. **Student ID:**_____

2. **Age:** _____

3. **Gender:**

Male_____

Female _____

No Response_____

4. **Current Academic Status:**

Freshman_____

Sophomore_____

Junior_____

Senior_____

5. **Number of academic credits currently enrolled:** _____

6. **Approximate Grade Point Average (0.00-4.0):** _____

7. **Ethnicity:**

Caucasian _____

Latino/Hispanic_____

African American/Black_____

Native American/Pacific Islander _____

Asian American _____

Middle Eastern _____

International Student (please specify) _____

Other (please specify) _____

8. Sexual Orientation:

Heterosexual _____

Gay _____

Lesbian _____

Bi-Sexual _____

Transgendered _____

Queer _____

Other (Please describe): _____

9. Student Athlete Yes/No (please specify which program): _____

10. Is this your first alcohol-related violation (Yes/No): _____

11. Other previous alcohol-related violation(s) (please select all that apply and number of offenses):

Minor in Possession(MIP) _____

Driving Under the Influence (DUI) _____

Disorderly Conduct _____

Other (please specify) _____

12. Substances Used in Past Month (please select all that apply):

Alcohol_____

Marijuana_____

Cocaine (coke, crack, rock, freebase)_____

Hallucinogens (LSD, acid, mushrooms, Salvia, PCP, Special K, Ecstasy)_____

Methamphetamine (speed, crystal meth, ice, crank) _____

Street Opioids (heroin, opium)_____

Prescription Opioids (Oxycodone [OxyContin, Percocet], hydrocodone [Vicodin],
methadone, buprenorphine)_____

Prescription Stimulants (Adderall, Ritalin, Concerta, Dexadrine)_____

Inhalants (nitrous oxide, glue, gas paint thinner)_____

Anabolic Steroids (testosterone) _____

Alcohol Use Disorders Identification Test (AUDIT)

Because alcohol use can affect your health and interfere with certain medications and treatments, it is important that we ask some questions about your use of alcohol. Your answers will remain confidential so please be honest.

Instructions: Place an X in one box that best describes your answer to each question.

Questions	0	1	2	3	4
1. How often do you have a drink containing alcohol?	Never	Monthly or Less	2-4 times a month	2-3 times a week	4 or more times a week
2. How many drinks containing alcohol do you have on a typical day when you are drinking?	1 or 2	3 or 4	5 or 6	7 to 9	10 or more
3. How often do you have six or more drinks on one occasion?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily
4. How often during the last year have you found that you were no able to stop drinking one you had started?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily

5. How often during the last year have you failed to do what was normally expected of you because of drinking?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily
6. How often during the last year have you needed a first drink in the morning to get yourself going after a heavy drinking session?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily
7. How often during the last year have you had a feeling of guilt or remorse after drinking?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily
8. How often drinking the last year have you been unable to remember what happened the night before because of your drinking?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily
9. Have you or someone else been injured because of your drinking?	No		Yes, but not in the last year		Yes, during the last year

10. Has a relative, friend, doctor, or other health care worker been concerned about your drinking or suggested you cut down?	No		Yes, but not in the last year		Yes, during the last year
Total					

Daily Drinking Questionnaire (DDQ)

(LNH Question...should this be one week or in the last week?)

Instructions: Think of a **typical two week** period in your recent past. In the calendar below, please enter the number of “standard drinks” (see chart) you had on each day **and the number of hours you spent drinking. Enter “0” if you do not drink.**

One “Standard Drink” includes:

12 oz. of beer or cooler

10 oz. of microbrew

8-9 oz. of malt liquor

5 oz. of table wine

1.5 oz. of hard liquor

Week One	Sun	Mon	Tue	Wed	Thurs	Fri	Sat
Number of Drinks							
Number of Hours Drinking							
Week Two	Sun	Mon	Tue	Wed	Thurs	Fri	Sat
Number of Drinks							
Number of Hours Drinking							

Brief Young Adult Alcohol-Related Consequences Questionnaire (B-YAACQ)

Instructions: Below is a list of events that sometimes occur either during or after drinking alcohol. Next to each item below, please indicate approximately how many times each of the following happened to you in the past month and in the last year, either while you were drinking or as a result of your drinking.

Questions	# times in past month	# times in past year
1. While drinking, I have said or done embarrassing things.		
2. I have had a hangover (headache, sick stomach) the morning after I had been drinking.		
3. I have felt very sick to my stomach or thrown up after drinking.		
4. I often have ended up drinking on nights when I planned not to drink.		
5. I have taken foolish risks when I have been drinking.		
6. I have passed out from drinking.		
7. 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.		
8. When drinking, I have done impulsive things I regretted later.		
9. I've not been able to remember large stretches of time while drinking heavily.		
10. I have driven a car when I knew I had too much to drink to drive safely		
11. I have not gone to work or missed classes at school because of drinking, a hangover, or illness caused by drinking.		
12. My drinking has gotten me into sexual situations I later regretted.		
13. I have often found it difficult to limit how much I drink.		
14. I have become very rude, obnoxious, or insulting after drinking.		
15. I have woken up in an unexpected place after heavy drinking.		
16. I have felt badly about myself because of my drinking.		

17. I have less energy or felt tired because of my drinking.		
18. The quality of my work or school work has suffered because of my drinking.		
19. I have spent too much time drinking.		
20. I have neglected my obligations to family, work, or school because of drinking.		
21. My drinking has created problems between myself and my boyfriend / girlfriend / spouse, parents, or other near relatives.		
22. I have been overweight because of drinking.		
23. My physical appearance has been harmed by my drinking.		
24. I have felt like I needed a drink after I'd gotten up (before breakfast).		
Total		

Risky Sex Scale (RSS)

Instructions: Indicate to what extent you *agree or disagree* with the following

statements. Use the answer key as follows: Strongly Agree (5); Agree (4); Not Sure (3);

Disagree (2); Strongly Disagree (1).

Questions	5	4	3	2	1
1. I often feel sexier after I've had a couple of drinks.					
2. I'm a better lover after a few drinks.					
3. Women can have orgasms more easily if they have been drinking.					
4. I enjoy having sex more if I've had some alcohol.					
5. I am more romantic when I drink.					
6. I feel more masculine (feminine) after a few drinks.					
7. After a few drinks, I am more sexually responsive.					
8. If I have been drinking or using other drugs, I am probably more likely to engage in unprotected sex.					
9. If I have been drinking or using other substances with a new date, I am more likely to have sex with that person.					
10. I am more likely to have unplanned sex if I have been					

drinking or using other substances.					
11. If I have been drinking or using other substances with a familiar companion, I am more likely to have sex with that person.					
12. Women are more vulnerable to sexual assault if they have been drinking or using other drugs					
13. Women seem more inclined to have sex if they have been drinking, than if they have not been drinking.					
14. Men are more likely to commit sexual assault if they have been drinking or using other drugs.					
Total					

Harm Reduction Behavior Scale (HRBS)

Instructions: In the last two weeks, please indicate most accurately how often you engage in the following behaviors. Use the answer key as follows: Never or almost never (0); Sometimes (1); Often (2); Always or almost always (3).

Questions	0	1	2	3
1. Before drinking I establish a plan of where I'm going, how I am going to get there, and how I will get home safely.				
2. Prior to drinking, I set a limit of the number of drinks I intend on having.				
3. I space my drinks out throughout the night.				
4. I have several shots of alcohol or alcoholic drinks in a row to feel the effects more quickly (reverse code).				
5. I eat food and drink non-alcohol beverages while drinking alcohol.				
6. I am able to turn down drinks or offers to drink from others and friends if I feel that I have had enough alcohol or do not want to drink.				
7. My friends will prevent me from drinking excessive amounts of alcohol if they notice that I have had too				

much.				
8. I will intervene or prevent a friend from drinking excessive amounts of alcohol if I feel that they have had too much to drink.				
9. My individual goals, personal values, or future career plans strongly influence my behaviors while drinking in a positive way.				
10. Reflection on my own (or others) negative past drinking related experiences influence my current drinking behaviors in a positive way.				
Total				

University of Rhode Island Change Assessment Scale (URICA)

Instructions: Each statement describes how a person might feel when starting therapy or approaching problems in their lives. Please indicate the extent to which you tend to agree or disagree with each statement. In each case, make your choice in terms of how you feel right now, not what you have felt in the past or would like to feel. There are FIVE possible responses to each of the items in the questionnaire:

1 = Strongly Disagree 2 = Disagree

3 = Undecided 4 = Agree

5 = Strongly Agree

1. As far as I'm concerned, I don't have any problems that need changing.
2. I think I might be ready for some self-improvement.
3. I am doing something about the problems that had been bothering me.
4. It might be worthwhile to work on my problem.
5. I'm not the problem one. It doesn't make much sense for me to be here.
6. It worries me that I might slip back on a problem I have already changed, so I am here to seek help.
7. I am finally doing some work on my problem.
8. I've been thinking that I might want to change something about myself.
9. I have been successful in working on my problem but I'm not sure I can keep up the effort on my own.
10. At times my problem is difficult, but I'm working on it.
11. Being here is pretty much a waste of time for me because the problem doesn't have to do with me.
12. I'm hoping this place will help me to better understand myself.
13. I guess I have faults, but there's nothing that I really need to change.
14. I am really working hard to change.

15. I have a problem and I really think I should work at it.
16. I'm not following through with what I had already changed as well as I had hoped, and I'm here to prevent a relapse of the problem.
17. Even though I'm not always successful in changing, I am at least working on my problem.
18. I thought once I had resolved my problem I would be free of it, but sometimes I still find myself struggling with it.
19. I wish I had more ideas on how to solve the problem.
20. I have started working on my problems but I would like help.
21. Maybe this place will be able to help me.
22. I may need a boost right now to help me maintain the changes I've already made.
23. I may be part of the problem, but I don't really think I am.
24. I hope that someone here will have some good advice for me.
25. Anyone can talk about changing; I'm actually doing something about it.
26. All this talk about psychology is boring. Why can't people just forget about their problems?
27. I'm here to prevent myself from having a relapse of my problem.
28. It is frustrating, but I feel I might be having a recurrence of a problem I thought I had resolved.
29. I have worries but so does the next guy. Why spend time thinking about them?
30. I am actively working on my problem.
31. I would rather cope with my faults than try to change them.
32. After all I had done to try to change my problem, every now and again it comes back to haunt me.

Scoring:

Precontemplation items 1, 5, 11, 13, 23, 26, 29, 31

Contemplation items 2, 4, 8, 12, 15, 19, 21, 24

Action items 3, 7, 10, 14, 17, 20, 25, 30

Maintenance items 6, 9, 16, 18, 22, 27, 28, 32

Student Engagement Instrument (SEI)

Instructions: Since attending the University of Oregon, please indicate most accurately to what extent you *agree* or *disagree* with the following statements. Use the answer key as follows: Strongly Agree (1); Agree (2); Disagree (3); Strongly Disagree (4).

1. My family/guardian(s) are there for me when I need them.
2. After finishing my schoolwork I check it over to see if it's correct.
3. My teachers are there for me when I need them.
4. Other students here like me the way I am.
5. Adults at my school listen to the students.
6. Other students at school care about me.
7. Students at my school are there for me when I need them.
8. My education will create many future opportunities for me.
9. Most of what is important to know you learn in school.
10. The school rules are fair.
11. Going to school after high school is important.
12. When something good happens at school, my family/guardian(s) want to know about it.
13. Most teachers at my school are interested in me as a person, not just as a student.
14. Students here respect what I have to say.
15. When I do schoolwork I check to see whether I understand what I'm doing.
16. Overall, my teachers are open and honest with me.
17. I plan to continue my education following high school.
18. I'll learn, but only if the teacher gives me a reward.

19. School is important for achieving my future goals.
20. When I have problems at school my family/guardian(s) are willing to help me.
21. Overall, adults at my school treat students fairly.
22. I enjoy talking to the teachers here.
23. I enjoy talking to the students here.
24. I have some friends at school.
25. When I do well in school it's because I work hard.
26. The tests in my classes do a good job of measuring what I'm able to do.
27. I feel safe at school.
28. I feel like I have a say about what happens to me at school.
29. My family/guardian(s) want me to keep trying when things are tough at school.
30. I am hopeful about my future.
31. At my school, teachers care about students.
32. I'll learn, but only if my family/guardian(s) give me a reward.
33. Learning is fun because I get better at something.
34. What I'm learning in my classes will be important in my future.
35. The grades in my classes do a good job of measuring what I'm able to do.

Brief COPE

Instructions: Reflect on a current or recent (In the past month) stressful situation. Please indicate to what extent you engaged in the following thoughts or behaviors to manage this stressful situation. Use the answer key as follows: “I haven’t been doing this at all” (0); “I’ve been doing this a little” (1); “I’ve been doing this sometimes” (2); “I’ve been doing this a lot” (3).

Questions	0	1	2	3
1. I’ve been concentrating my efforts on doing something about the situation I’m in.				
2. I’ve been taking action to try to make the situation better.				
3. I’ve been trying to come up with a strategy about what to do.				
4. I’ve been thinking hard about what steps to take.				
5. I’ve been trying to see it in a different light, to make it more positive.				
6. I’ve been looking for something good in what is happening.				
7. I’ve been accepting the reality of the fact that it has happened.				
8. I’ve been learning to live with it.				
9. I’ve been making jokes about it.				

10. I've been making fun of the situation.				
11. I've been trying to find comfort in my religion or spiritual beliefs.				
12. I've been praying or meditating.				
13. I've been getting emotional support from others.				
14. I've been getting comfort and understanding from someone.				
15. I've been trying to get advice or help from other people about what to do.				
16. I've been getting help and advice from other people.				
17. I've been turning to work or other activities to take my mind off things.				
18. I've been doing something to think about it less, such as going to movies, watching TV, reading, daydreaming, sleeping, shopping.				
19. I've been saying to myself "this isn't real".				
20. I've been refusing to believe that it has happened.				
21. I've been saying things to let my unpleasant feelings escape.				
22. I've been expressing my negative feelings.				
23. I've been using alcohol or other drugs to make				

myself feel better.				
24. I've been using alcohol or other drugs to help me get through it.				
25. I've been giving up trying to deal with it.				
26. I've been giving up the attempt to cope.				
27. I've been criticizing myself.				
28. I've been blaming myself for things that happened.				
				Total

Patient Health Questionnaire -4 (PHQ-4)

Instructions: Over the past two weeks, how often have you been bothered by the following problems? Use the answer key as follows: “Not at all” (0); “Several days” (1); “More than half the days” (2); “Nearly every day” (3).

Questions	0	1	2	3
1. Little interest or pleasure in doing things.				
2. Feeling down, depressed, or hopeless.				
3. Feeling nervous, anxious, or on edge.				
4. Not being able to stop or control worrying.				
Total				

BASICS Intervention Fidelity Observation Checklist

Instructions: Following the BASICS intervention, please assess whether or not you addressed the following BASICS components in your class. Use the answer key as follows: No (0) or Yes (1).

Facilitators review of:	0	1
1. Confidentiality, Consent to A/V taping, Release of Information, & Title IX		
2. Alcohol Related Expectancies (e.g. “Pros & Cons of Drinking”)		
3. Physiological effects of Alcohol (e.g. Biphasic effect, Point of Diminishing returns, Tolerance, etc.)		
4. Personalize Feedback Report (e.g. Alcohol quantity frequency and BAC)		
5. Harm-Reduction Strategies		
6. UCTC Resources		
Signature & Date:	Total:	

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