Alcohol Interventions for Mandated Students (Project AIMS)

Diane E. Logan

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Reading Committee:

Mary E. Larimer, Chair

Jason R. Kilmer

Kevin M. King

Program Authorized to Offer Degree:

Department of Psychology

University of Washington

Abstract

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Diane E. Logan

Chair of the Supervisory Committee:
Professor Mary E. Larimer
Departments of Psychiatry and Behavioral Sciences and Psychology

College student drinking continues to be a significant problem, with consequences directly impacting students, institutions, and communities. While research with volunteer participants generally supports the use of cognitive behavioral and motivational interventions in reducing drinking quantities and consequences, research with mandated students (students referred for an intervention following violation of a campus alcohol policy) continues to produce mixed results. The current study evaluated the effectiveness of three interventions: Alcohol Skills Training Program (ASTP) groups, Brief Alcohol Screening and Intervention for College Students (BASICS) feedback sessions, and Alcohol Diversion Program (ADP) treatment-as-usual education groups in a sample (*N* = 61) of mandated students. Pre-intervention behavior change and intervention techniques were also evaluated. Attitudes toward campus policies, readiness to change, intervention satisfaction, and reactions to the sanctioning incident were examined as moderators of intervention efficacy. Finally, defensiveness, norms perceptions, protective behavioral strategies, and alcohol expectancies were examined as mediators of behavioral change. Results revealed a significant pre-intervention decrease in monthly drinks and drinking days. There was a significant effect of time for reductions in blood alcohol content (BAC) and

weekly drinks but not consequences. While ASTP and BASICS participants reported decreases in BAC, ADP participants experienced increases over time. Reductions in consequences were related to ASTP participation and lower policy support at baseline. Low external responsibility for the incident predicted greater reductions in BAC, and greater incident aversiveness predicted lower BAC and weekly drinks. Increases in pre-intervention defensiveness were more pronounced among ADP participants as well as male, older, and Greek students. Finally, decreases in overall defensiveness were associated with ASTP participants and more in-session complex reflections. Results from this study suggest a complex relationship between mandated student characteristics and interventions, highlighting potential iatrogenic effects from education-only mandated group interventions, the importance of incident reactions on behavior change, and factors associated with pre- and post-intervention defensiveness.

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DEDICATION

I dedicate this work to my family, including those who created me and those whom I created. Nothing inspires my passion for my work, or distracts me more from completing it. While our distributions may never quite reach normality, your effect sizes are off the scale. I am so lucky to have you in my life, reminding me of what is important.

INTRODUCTION

College student drinking:

College student drinking continues to be a significant problem, with consequences directly impacting students, institutions, and communities. National surveys report past year alcohol use of college students at 79% and thirty-day prevalence at 65% with 44% reporting having "been drunk" in the past month (Johnston, O'Malley, Bachman, & Schulenberg, 2011). Over one-third of full-time college students report at least one episode of five or more drinks in the past two weeks, with rates ranging from 32% of women to 44% of men (Johnston, et al., 2011). Even more concerning are reports of "extreme binge drinking" in the past two weeks, with 13% of college students reporting having 10 or more drinks in a row (24% male, 7% female) and 5% endorsing 15 or more drinks in a row (10% male, 2% female) (Johnston, et al., 2011). College students also have higher lifetime, annual, and 30-day prevalence rates compared to their non-collegiate peers (Johnston, et al., 2011). Additionally, although college students tend to engage in less heavy episodic drinking prior to college than their non-college bound peers, they become more likely to engage in heavy drinking during college (O'Malley & Johnston, 2002; Timberlake et al., 2007), and have a higher prevalence of heavy episodic drinking (R. W. Hingson, Zha, & Weitzman, 2009; Johnston, et al., 2011). Trends further indicate either no reductions in binge drinking (for college men) or actual increased rates (for college women) over the past 30 years (Grucza, Norberg, & Bierut, 2009). Frequent heavy drinkers are at particular risk for meeting DSM-IV criteria for alcohol abuse (13 times increased likelihood) and alcohol dependence (19 times increased likelihood) compared with peers who drink alcohol

but not heavily (Knight et al., 2002). Overall, the college age cohort has the highest prevalence of diagnosable alcohol use disorders (DHHS, 2007).

College students also face serious consequences resulting both from their own and their peers' alcohol use. Alcohol is associated with over 5,500 unintentional deaths, 500,000 unintentional injuries, and 600,000 assaults annually (R. Hingson, Heeren, Winter, & Wechsler, 2005; R. W. Hingson, et al., 2009). Approximately 3.4 million college students report driving under the influence of alcohol (R. W. Hingson, et al., 2009). Additional consequences of heavy alcohol use include increased risk of sexual assaults, legal problems, academic failure, health and developmental problems, and financial concerns (R. Hingson, et al., 2005; R. W. Hingson, Heeren, Zakocs, Kopstein, & Wechsler, 2002; Knight, et al., 2002; Pascarella et al., 2007; Perkins, 2002b), as well as secondhand effects by peers, such as loss of sleep due to others' drinking behaviors (Wechsler et al., 2002).

In response to these significant patterns of use and consequences, national agencies have issued "Call to Action" publications targeting underage drinking (DHHS, 2007) and college student drinking specifically (National Institute on Alcohol Abuse and Alcoholism NIAAA, 2002; National Institute on Alcohol Abuse and Alcoholism NIAAA, 2007). Both of these directives emphasize the importance of empirically supported interventions. NIAAA (2002) identified strategies with demonstrated effectiveness in impacting drinking and related consequences within samples of college students (deemed "Tier 1" interventions), and these included interventions incorporating cognitive-behavioral techniques (CBT), motivational interviewing (MI), and norms clarification. Each of these techniques will be discussed as they relate to college student drinking interventions.

Components of effective interventions

Cognitive-behavioral techniques (CBT): Previous research has indicated that information-only interventions do not necessarily lead to behavior change (for a review, see (Cronce & Larimer, 2011)). CBT combines accurate information, such as campus norms and realistic effects of alcohol, with behavioral techniques to assist students in reducing alcohol use. A number of CBT skills can be included in college alcohol interventions. For example, students are taught to monitor their drinking which can increase their awareness of the behavior. High-risk situations are discussed and realistic alternatives can be identified (Marlatt & Gordon, 1985). Information regarding blood alcohol concentration (BAC) effects can be presented, and students may be provided with personalized BAC cards to assist them in monitoring their own BAC. Students can also be taught specific behavioral skills to reduce drinking and related consequences, including spacing drinks over more time, setting a limit, keeping track of drinks, or choosing to not drink at all. The CBT focus of interventions is designed to give students specific tools that they may choose to implement when appropriate, thereby supporting autonomy.

Motivational Interviewing (MI): MI (W. R. Miller & Rollnick, 2002) is considered a clinical style of interacting with an individual with roots in client-centered approaches to therapeutic change. MI emphasizes rapport, a non-judgmental style, client acceptance of self, autonomy, internal motivation, and self-efficacy, while at the same time attempting to evoke

internally motivated talk about behavior change. These tenets tend to be more harmonious with college student identity and developmental stage (discussed further below) than traditional directive therapeutic approaches. The non-confrontational spirit of MI tends to be more effective than confrontational interventions for college students and other emerging adults (Baer & Peterson, 2002; W. R. Miller, 1983; Tober, 1991). The four primary tenets of MI, expressing empathy, developing discrepancy, rolling with resistance, and supporting self-efficacy each help the facilitator develop rapport with the participant and support the autonomy of the individual while focusing on the problematic behavior (alcohol use).

Norms clarification: A significant amount of research has reported that norm perceptions influence drinking behaviors (Borsari & Carey, 2001; S. E. Collins, Carey, & Sliwinski, 2002; Larimer, Turner, Mallett, & Geisner, 2004; Lewis & Neighbors, 2004; Lo, 1995; Perkins, 2002a; Perkins & Berkowitz, 1986). College students tend to overestimate descriptive norms, or perceptions of others' actual drinking, which is associated with increased individual drinking (Baer, Stacy, & Larimer, 1991; Borsari & Carey, 2003; Lewis & Neighbors, 2004; Thombs, Ray-Tomasek, Osborn, & Olds, 2005), though the amount and influence of misperceptions have received some recent critique (Pape, 2012). Many interventions attempt to correct these norm inflations by providing normative reeducation. Research has also indicated that students tend to overestimate injunctive norms, or others' perceived approval of drinking behaviors (Alva, 1998; Borsari & Carey, 2003; Perkins & Berkowitz, 1986; Prentice & Miller, 1993). Perceptions of approval or disapproval of drinking behaviors are related to higher and lower levels of individual drinking, respectively, particularly for perceptions of groups that are more proximal

and familiar (i.e. close friends versus parents or typical students) to the student (Alva, 1998; Baer, et al., 1991; Borsari & Carey, 2001, 2003; Chawla, Neighbors, Lewis, Lee, & Larimer, 2007; Chawla, Neighbors, Logan, Lewis, & Fossos, 2009; Larimer et al., 2011; Lewis et al., 2011; Lewis & Neighbors, 2004; Lo, 1995; C. Neighbors, LaBrie, et al., 2010; Thombs, et al., 2005).

College student developmental considerations

College represents a unique developmental period in young adulthood, and successful interventions must consider these factors to meet students where they are in terms of readiness and willingness to change. Risks for developing (or continuing) alcohol misuse, abuse, and/or dependence begin long before college age. Early developmental risk factors include biological and genetic factors; family influences including parental substance use and psychopathology, family harmony or aggression and violence; temperamental and personality factors including impulsivity, aggressiveness, and risk taking; behavioral factors such as age of first drink and regular consumption; and demographic risks including ethnicity, socioeconomic status, and household composition (Donovan & Molina, 2011; Ellis, Zucker, & Fitzgerald, 1997; Hopfer, Crowley, & Hewitt, 2003; King & Chassin, 2004; Thatcher & Clark, 2006; Zhou, King, & Chassin, 2006). However, the college years present additional risk factors in addition to general development.

Most students attend college during a developmental stage referred to as emerging adulthood. Emerging adulthood is described as a unique developmental stage between adolescence and adulthood, which allows for increased responsibility and independence while still retaining some reliance and interdependence characterized in adolescence (Arnett, 2000,

2001). Students in emerging adulthood tend to identify themselves as more independent (Arnett, 2000; Hornsey & Jetten, 2005; Markus, Mullally, & Kitayama, 1997), although they do not see themselves as having reached adulthood (Arnett, 2001). This developmental period is critical to the development of an identity that is separate from parents as well as peers. While the college environment presents additional opportunities for independence and growth, most students are still developmentally adolescents in terms of brain development, which increases the likelihood for risk-taking and places additional emphasis on immediate reinforcement with less behavioral control (Spear, 2002; Steinberg, 2004), translating into differences in alcohol-related intentions and behaviors (S. E. Collins, Witkiewitz, & Larimer, 2011).

Unique environmental considerations are present on college campuses as well (see (Wechsler & Nelson, 2008) for an overview). Specific risk factors include first year events such as leaving home and beginning college (White, McMorris, et al., 2006) although parental monitoring and permissiveness continue to be influential (Walls, Fairlie, & Wood, 2009), specific living situations including Greek affiliation (Danielson, Taylor, & Hartford, 2001) as well as specific on-campus residence hall layouts (Cross, Zimmerman, & O'Grady, 2009), campus environmental factors including alcohol availability and price (Weitzman, Folkman, Lemieux Folkman, & Wechsler, 2003; J. Williams, Chaloupka, & Wechsler, 2005), campus and community alcohol policies and laws (Lenk, Erickson, Nelson, Winters, & Toomey, 2012; T. F. Nelson, Naimi, Brewer, & Wechsler, 2005; Wechsler, Eun, Gledhill-Hoyt, & Nelson, 2001; J. Williams, et al., 2005), and high-risk specific events like holidays and school breaks (C. Neighbors et al., 2011), although many of these represent risks beyond the dichotomy of college/non-college distinctions (Carter, Brandon, & Goldman, 2010).

Interventions for college student drinking need to take into consideration not just the environmental context, but also developmental factors relevant to emerging adults. Emerging adults place great importance on independence and identity, and any threat to their autonomy can be counter-therapeutic and perhaps result in a rebound effect (Larimer et al., 1998; Walters & Baer, 2006). As many students do not view their alcohol use as a problem (Vik, Culbertson, & Sellers, 2000), an abstinence-based program may seem too extreme and not match social norms of the environment. Education-only programs provide students with information, but these emerging adults are more likely to test this alcohol-related information rather than internalize it based on the word of an adult (Crundall, 1995; C. Neighbors, Larimer, Lostutter, & Woods, 2006). When any discrepancies are found between the provided information and actual experiences, the student may discount all of the previous information as either being incorrect or not applying to the student's situation. In addition, even when students learn the educational material, it does not necessarily lead to behavior change (Larimer & Cronce, 2007; Larimer, et al., 1998). Further, college student interventions also occur during a unique developmental phase of drinking behaviors, as most students have initiated use only within the previous few years, and most are on the ascending limb of their drinking trajectory (Johnston, et al., 2011; C. B. Nelson, Heath, & Kessler, 1998; O'Malley & Johnston, 2002).

Alcohol interventions for college students:

Research evaluating college student interventions over the past two decades has identified strategies with promising outcomes. As noted previously, NIAAA has designated Tier 1 interventions that have favorable outcomes with college students in at least two independent

studies (National Institute on Alcohol Abuse and Alcoholism NIAAA, 2002). The two experimental conditions in the current study were provided as specific examples of the general approaches listed as Tier 1 interventions: Alcohol Skills Training Program (ASTP) and Brief Alcohol Screening and Intervention for College Students (BASICS). ASTP combines cognitive-behavioral skills, norms clarification, and motivational enhancement techniques in a group setting (E. T. Miller, Kilmer, Kim, Weingardt, & Marlatt, 2001). Multiple-session ASTP groups have repeatedly demonstrated effectiveness at significantly reducing alcohol intake (decreases of 40-50%) as well as negative consequences with reductions sustained at two-year follow up (Baer et al., 1992; Fromme, Marlatt, Baer, & Kivlahan, 1994; Kivlahan, Marlatt, Fromme, Coppel, & Williams, 1990).

Individual BASICS feedback interventions incorporate personalized feedback with Motivational Interviewing (W. R. Miller & Rollnick, 2002) in a brief one-on-one setting (Dimeff, Baer, Kivlahan, & Marlatt, 1999). Both single-session and two-session BASICS have demonstrated similar effectiveness in reducing drinking amounts and consequences for extensive follow-up periods (Baer, Kivlahan, Blume, McKnight, & Marlatt, 2001; Borsari & Carey, 2000; Larimer et al., 2001; Marlatt et al., 1998; Murphy et al., 2001). Most recently, ASTP and BASICS have also demonstrated generalizability of effectiveness with multicultural and international college students (Hanewinkel & Wiborg, 2005; Hernandez et al., 2006; Stahlbrandt, Johnsson, & Berglund, 2007).

Empirical support for individual interventions incorporating both individual feedback sessions and personalized normative feedback comes from extensive quantitative (Carey, Scott-Sheldon, Carey, & DeMartini, 2007) and qualitative (Branscum & Sharma, 2010; Cronce &

Larimer, 2011; Larimer & Cronce, 2002, 2007) reviews, with little to no evidence of effectiveness for education-only and/or values clarification interventions (Cronce & Larimer, 2011; Thadani, Huchting, & LaBrie, 2009). Given the considerable time and cost considerations in providing individual in-person sessions, researchers have begun evaluating alternative delivery mechanisms via the web (Hustad, Barnett, Borsari, & Jackson, 2010; C. Neighbors, Lewis, et al., 2010; Walters & Neighbors, 2011) as well as considering in-person cost-effectiveness (Cowell, Brown, Mills, Bender, & Wedehase, 2012) and the impact of shortening existing interventions (Kulesza, Apperson, Larimer, & Copeland, 2010). Results suggest that among volunteer college students, web-based interventions show similar effectiveness to standard in-person sessions (Hustad, et al., 2010; C. Neighbors, M. A. Lewis, et al., 2010; Walters & Neighbors, 2011), and that very brief (10 minute) in-person interventions had similar outcomes to the more typical 50 minute sessions (Kulesza, et al., 2010). While both of these findings could potentially reduce the expenses associated with providing interventions, evaluations of effective components suggest that in spite of the additional expense, motivational interviewing with personalized feedback represented the greatest cost-effectiveness given the impact on changing drinking behaviors (Cowell, et al., 2012; C. J. Neighbors, Barnett, Rohsenow, Colby, & Monti, 2010).

Mandated student characteristics

Mandated students (students referred for an intervention following violation of a campus alcohol or drug policy) comprise a high-risk subpopulation of college students, with unique intervention needs. The number of mandated students and the scope of the sanctions

continue to increase (Barnett & Read, 2005) as higher education institutions continue to adjust and enforce policies related to underage drinking (as recommended by the Federal "Call to Action" publications; DHHS, 2007; NIAAA, 2002). As mandated students are clearly a liability-management, risk-management, and health and safety concern on college campuses, it is imperative that researchers identify supported interventions with demonstrated effectiveness while maximizing limited campus resources.

However, research has indicated that mandated students differ from volunteer students in significant ways, and do not consistently benefit from interventions found to be efficacious with volunteers, including reporting smaller decreases (and occasionally even reporting increases) in drinking behaviors and smaller effect sizes when drinking reductions are detected (Carey, Henson, Carey, & Maisto, 2009; Cimini et al., 2009; Doumas, Workman, Smith, & Navarro, 2011; LaBrie, Lamb, Pedersen, & Quinlan, 2006). These variable findings can be partially explained by the unique characteristics of mandated (versus volunteer) students. Many studies have begun to explore differences between mandated and volunteer populations as well as within the mandated subgroup, including demographics, drinking behaviors, and individual attitudes and characteristics. A number of these characteristics are reviewed below.

Demographics, drinking behaviors, and norms: Male students tend to be overrepresented in the mandated population (Harper, Harris, & Mmeje, 2005). Mandated students are also more likely to report lower grades than their non-mandated peers (Barnett et al., 2004). Studies comparing drinking behaviors of mandated students are mixed. One study found that mandated students reported more heavy drinking days and alcohol-related consequences than their peers who were not mandated, though there were no differences in

frequency of drinking days or perceived drinking norms (Barnett, et al., 2004). In contrast, another study found significantly less drinking and fewer consequences among students mandated to participate in alcohol interventions, in comparison to a group of students from undergraduate psychology courses who were screened as at-risk drinkers and voluntarily agreed to attend these interventions (Palmer, 2004).

Defensiveness: Defensiveness toward an intervention is considered a form of psychological reactance, potentially related to a loss of autonomy particularly in a mandated population (Palmer, 2004). In other words, these students are not given a choice to participate, and may experience greater reactance (or in Motivational Interviewing terms, resistance) to any intervention imposed (Palmer, 2004). Palmer and colleagues found mandated students reported significantly more intervention defensiveness than voluntary participants (Palmer, 2004; Palmer, Kilmer, Ball, & Larimer, 2010).

Readiness and motivation to change: Readiness to change refers to the Stages of Change (SOC) model, which identifies five stages of behavior change: precontemplation, contemplation, preparation, action, and maintenance (Prochaska & DiClemente, 1991). A majority of college heavy drinking students fall into the precontemplation category (Vik, et al., 2000) and are not aware of a need to change. This might apply even more to mandated students, consistent with defensiveness and loss of autonomy as discussed above. Findings comparing mandated and non-mandated students have been mixed, with studies reporting no difference in readiness to change (Barnett, et al., 2004)and less readiness to change in mandated groups (Palmer, 2004). Studies within mandated groups have identified other factors related to readiness to change in this population. Interestingly, readiness to change was related

to fewer drinking days, fewer heavy episodic drinking occasions, and fewer alcohol-related consequences in one mandated population (Shealy, Murphy, Borsari, & Correia, 2007). Another study found that mandated male students expressed much lower motivation and lower readiness to change following a sanction, perhaps in part due to men expressing higher perceptions of regarding friends' permissiveness of a sanction than women (Carey & DeMartini, 2010).

Sanction-specific considerations: The common thread for all mandated students is that they have been found in violation of an alcohol-related policy and sanctioned to some form of penalty, intervention, or often both. Studies have begun to evaluate the independent impact of the sanction on drinking behaviors and attitudes, finding that mandated students made significant reductions in alcohol-related behaviors prior to any intervention and students with the most serious infractions made the greatest reductions (Morgan, White, & Mun, 2008). Further, heavier drinking during the sanctioning incident was related to feeling more responsible, which made perceptions of the event more aversive, which was then related to increased readiness to change scores (Barnett, Goldstein, Murphy, Colby, & Monti, 2006). Further evaluating incident-specific drinking, one study (Hustad et al., 2011) found that the sanction day tended to have higher drinking than the typical pattern for 2 weeks prior, and was higher for the same day reports for two weeks following. There was also a significant but modest decrease in consumption for the two weeks following the incident, with no sex differences. Previous research has also identified different clusters of mandated students based on their typical drinking behaviors, incident drinking, and incident reactions (Barnett et al., 2008). Three clusters were identified: "Why Me?" had low prior and current drinking levels and

low reactions; “So What?” had high prior drinking behaviors, moderate current levels, and low reactions; “Bad Incident” had low to moderate previous levels but high incident drinking and strong reactions to the incident.

Intervention considerations: A further study (Mun, White, & Morgan, 2009) found that when controlling for baseline drinking behaviors, mandated students with greater readiness to change, older students, female students, and those with more severe incidents were more likely to improve following an intervention, though only female sex and severe incident continued to be significant when all variables were included. Further, those with a serious incident or more alcohol-related problems at baseline were more likely to have improved following a brief motivational intervention than written feedback only, with no difference in the non-serious incident category. Another study found that students with low internal responsibility actually fared better following computerized delivery versus an in-person feedback session, with no impact of aversiveness, consequences, sex, or readiness to change (Mastroleo, Murphy, Colby, Monti, & Barnett, 2011). Interestingly, sex, consequences, and aversiveness all moderated an additional booster session, such that men and those who did not find the incident aversive who received a booster session fared worse, while those with more consequences fared better. This suggests mandated students who perceive themselves more in need of prevention services may fare better in such additional services than those who do not believe they need them.

Summary: All in all, these findings support the heterogeneity of the mandated college student population, and may help explain why interventions for mandated students have met with mixed success, including variability in both outcomes and effect sizes across studies

(Amaro et al., 2009; Barnett, Murphy, Colby, & Monti, 2007; Barnett, et al., 2004; Borsari & Carey, 2005; Borsari, O'Leary Tevyaw, Barnett, Kahler, & Monti, 2007; Carey, Carey, Henson, Maisto, & DeMartini, 2011; Cimini, et al., 2009; Doumas, McKinley, & Book, 2009; Doumas, Workman, Smith, et al., 2011; Fromme & Corbin, 2004; LaChance, Feldstein Ewing, Bryan, & Hutchison, 2009; O'Leary Tevyaw, Borsari, Colby, & Monti, 2007; Palmer, Kilmer, et al., 2010; Terlecki, Larimer, & Copeland, 2010; White, Morgan, et al., 2006; White, Mun, Pugh, & Morgan, 2007).

Alcohol interventions for mandated students

A variety of interventions, including group and individual approaches delivered via in-person, computerized, and written administration, have demonstrated mixed success with mandated students. Given the relevance to the current study, the evidence for each of these intervention implementation approaches is summarized below.

Mandated student group interventions: Nine studies have tested group interventions for mandated students. The first (Keillor, Perkins, & Horan, 1999) tested a videotaped expectancy challenge against an alcohol education group with 25 male mandated students. While no differences were reported at post-test in drinks per week or alcohol expectancies, alcohol knowledge did increase within the education group. This study was limited by the small sample size, lack of follow-up, and no control group.

Palmer (2004, 2010) tested the ASTP group intervention with mandated students (n = 90), heavy drinking volunteers (n = 119), and heavy drinking controls (assessment-only, n = 85).

Results at three-month follow-up indicated no significant changes in outcome measures for mandated students. Volunteers in both the ASTP and control conditions reported significant reductions in consequences, and all participants reported fewer drinking days. Readiness to change (RTC) improved in all participants regardless of group, though mandated student post-assessment only reached voluntary participant baseline levels. Defensiveness did moderate outcomes, and predicted an increase in peak drinking among mandated students at follow-up (Palmer, 2004). This study also had several limitations, including the lack of a control group for the mandated participants, a short follow-up period, and group characteristics that were not equivalent at baseline (including drinking behaviors as well as attitudes like defensiveness.)

A Lifestyle Management Class intervention, consisting of two 2-hour groups, was evaluated for mandated (n = 113) and volunteer (n = 403) participants (Fromme & Corbin, 2004). This study included a six-week wait-list control for mandated students and an assessment-only control for voluntary participants. Results indicated that all participants reported decreases in typical drinks per week and decreases in heavy episodic drinking episodes. Intervention participants also reported greater decreases in driving after drinking and alcohol-related consequences. Contrary to the prior study, mandated students reported higher levels of readiness to change at baseline compared with voluntary participants, although no pre- to post-assessment changes were significant for any groups. This study reported only small effect sizes for changes post-intervention (up to d = 0.29 for consequences). Limitations of this study include 75-minute assessments, short follow-up, poor recruitment, a brief wait-list for mandated students, and a relatively small mandated sample size (group sizes were n = 45, 22,

and 46 for peer-delivered interventions, professional-delivered interventions, and control groups respectively).

Three studies have also evaluated single-session group motivational interventions for mandated students. The first assessed a single 60-90 minute intervention for 136 mandated students, with outcomes reported at one-month and three-month follow-up (LaBrie, et al., 2006). Participants were categorized as non-binge drinkers (*n* = 29), binge drinkers (*n* = 51), or frequent binge drinkers (*n* = 87). Most outcome measures decreased for all participants, including drinks per month, drinking days, average drinks, maximum drinks, alcohol-related consequences, and recidivism, with alcohol-behavior measures showing the greatest decreases within the frequent binge drinking group. In a related study, they evaluated a single 90-minute motivational intervention for 110 female mandated students (LaBrie, Thompson, Huchting, Lac, & Buckley, 2007). Follow-up data was collected each week through the 12 week follow-up. Participants were again categorized as non-binge drinkers (*n* = 26), binge drinkers (*n* = 45), or frequent binge drinkers (*n* = 39). Participants reported decreases in all outcome measures, including drinks per month, average drinks, maximum drinks, consequences, and drinking days, at three-month outcome. Most recently, they evaluated a single motivational enhancement group for male mandated students (LaBrie, Cail, Pedersen, & Migliuri, 2010). Over two years, 230 students were assessed each week for 12 weeks following the intervention, and then at three month follow up. Drinks per month and consequences decreased for everyone (though effect sizes were not reported). This study did not find any post-sanction/pre-intervention decreases in drinking as established in other studies. Upon testing a “post-hoc control group,” in which the researchers randomized individuals who had a natural delay in treatment

scheduling, they observed fewer drinks and consequences among students who received immediate interventions.

More recent studies continue to evaluate different group options for mandated students. One study found efficacy of a three hour group motivational enhancement intervention over and above six hour treatment as usual educational groups or three hour information only groups (LaChance, et al., 2009). Further, the experimental groups were successful in reducing positive expectancies, and the motivational group also increased participants' risk perceptions associated with drinking. In another study, 695 mandated students were randomized to one of three 2-hour group interventions: a motivational enhancement group, peer theater, or alcohol education (Cimini, et al., 2009). There were no significant changes in drinking measures or consequences at six month follow up, though further analyses found that decreases in descriptive norms (particularly those of best friends versus general students) and increases in use of protective strategies was associated with reductions in drinking over time.

Finally, one study evaluated an alcohol education group intervention for mandated students (Oswalt, Shutt, English, & Little, 2007). This intervention consisted of four 2.5-hour groups. Out of 400 mandated students enrolled in the groups, only 259 completed the post-test assessment, and 79 completed three-month follow up. Findings supported decreased drinks per week at post-test but no change at three-month follow up. Reported drinking days also decreased at post-test, but increased (above baseline) at three months. Some drinking consequences showed decreases at post-test, but none were significant at follow-up. Perceived number of drinks before experiencing consequences decreased at post-test and remained

lower at follow-up. Participant perception of his/her risk of alcoholism increased at post-test but was non-significant at follow-up. Limitations of this study include no control or comparison groups, short follow-up periods, small retention rates, the use of measures not standardized nor theoretically-based for this population, lack of motivational enhancement techniques, and ten-hour groups (exceeding typical capacity for implementation at most campuses)

Despite the promising findings in some of the latter studies, notable limitations across studies include the lack of a control group, lack of a comparison group, small group sizes, and short follow-up periods. Additionally, a significant portion (13-15%) of participants actually reported *increases* in binge drinking at three-month follow-up (with non-binge drinkers escalating to the binge drinker group, or binge drinkers escalating to the frequent binge drinker group)(LaBrie, et al., 2006; LaBrie, et al., 2007).

In sum, the findings of group interventions with mandated students vary as much as the interventions themselves. Results range from significant improvements to no change to iatrogenic effects following interventions. These studies are fraught with methodological limitations which confounds interpretation and generalizability. Given the cost-effective and time-limited benefits of group interventions, combined with promising outcomes in voluntary populations, more research with adequate populations is needed to identify mechanisms of change in group interventions while minimizing the iatrogenic effects noted above.

Mandated student individual interventions: Data from individual interventions with mandated students also reflect mixed findings. One study (Borsari & Carey, 2005) evaluated a single-session brief motivational intervention (average 62 minutes, *n* = 34) and an individual

alcohol education session (average 46 minutes; *n* = 30) in a sample of heavy drinking mandated students with outcomes assessed at three- and six-month follow-up. Reductions were reported at six months in heavy episodic drinking and alcohol-related consequences for all participants, and typical blood alcohol content decreased but did not reach significance. Alcohol-related consequences were reduced significantly more in the brief motivational intervention compared with the individual alcohol education session (within-group effect sizes: *d* = 1.11 BMI, .07 AE; between-group effect size *d* = .39). All other between-group effect sizes were small (*d* < .05), and within-group effects ranged from small to medium (.07-.67). While these results are promising, this study was limited by a particularly small sample size, no control or wait-list group, inclusion of heavy drinkers only, unsuccessful randomization, and presentation of all interventions by a single facilitator.

Another study evaluated a stepped-care approach for mandated students (*n* = 43) (Borsari, O'Leary Tevyaw, et al., 2007). In this design, all students received an assessment, a brief discussion about alcohol (11 minutes), and a book with alcohol information. At six-week follow-up, students were categorized either as responders (those not meeting risky drinking or alcohol-related consequence score cut-offs, *n* = 9) or non-responders (*n* = 32). Non-responders were then randomly assigned to receive a brief motivational intervention (*n* = 14) or assessment only (*n* = 18). Outcome data reflected self-reported decreases in heavy episodic drinking, drinking frequency, typical blood alcohol content, and alcohol-related consequences for all non-responders. There were no group differences between the motivational intervention and assessment-only groups, with within-group effect sizes ranging from small (*d* = .11) to large (*d* = .89). There were no significant changes in outcome measures for the responders, although

there was a trend towards increased drinking from six-week follow-up to ten-week follow-up. Limitations of this study include a very small sample size, short follow-up period, and absence of a control group. Further confounding results, the follow-up period for most participants was during finals or early summer, a time independently associated with reduced drinking among college students (Del Boca, Darkes, Greenbaum, & Goldman, 2004).

Another study (O'Leary Tevyaw, et al., 2007) compared a brief motivational intervention (*n* = 18) with a brief motivational intervention with peer-enhancement (*n* = 18 mandated student/peer dyads). At one-month follow-up, heavy drinking days and drinking frequency had decreased for all participants, though no changes were observed in drinks per occasion or alcohol-related consequences. Effect sizes were small to medium for both groups, ranging from *d* = .22 to .58. Limitations of this study include a very small sample size, limited follow-up, and no control group.

The next study (Barnett, et al., 2007) evaluated a brief motivational intervention (*n* = 106) in comparison to a computer-delivered intervention (Alcohol 101, *n* = 106), each with a one-month 25-minute booster. Computer-delivered interventions lasted 45 minutes, and the length of the motivational intervention was not reported. Outcome data were collected at three and twelve months. Findings supported a decrease in drinking frequency within the motivational group at three months, but all participants increased frequency at 12 months. Drinks per day increased only among the computer-based group at 12 months. There was no difference in alcohol consequences or one-year recidivism. The use of protective behavioral strategies increased for the motivational group at 3 and 12 month follow-up, and descriptive norms misperception decreased for both groups. Motivation to change increased for all

participants, and help-seeking behaviors increased for the motivational group at three months only (with no change for the computer group). All reported effect sizes were small, with *d* = 0.18-0.23. Limitations of this study include low recruitment rates (65%) and no control group.

Next, a series of studies have evaluated variations of a written-only feedback intervention for mandated students (White, Morgan, et al., 2006; White, Mun, & Morgan, 2008; White, et al., 2007). In the initial published study, White and colleagues (2006) compared a brief motivational session (*n* = 118) with written only feedback (*n* = 104). Outcomes at three month follow-up supported decreased drinks per week, heavy episodic drinking occasions, peak blood alcohol content, and alcohol-related consequences for all participants with no group differences. There was no change in drinking frequency. Effect sizes ranged from small to medium (*d* = 0.13 for alcohol frequency to *d* = 0.58 for alcohol problems). While this study appeared to support the use of written feedback interventions, thereby reducing the time- and cost-related burdens of in-person interventions, follow-up data at 15 months supported benefits for the brief motivational condition. Specifically, White and colleagues (2007) extended the previous research by comparing 15 month outcomes for this group of mandated students assigned to either brief motivational interventions (*n* = 180) or written-only feedback (*n* = 168). Findings support clear benefits for the motivational intervention participants, including decreased heavy episodic drinking, decreased consequences, initial decrease (at four months) with less increase in drinks per week at 15 months, and less increase in drinking days. Peak blood alcohol content decreased for all participants at 15 months. Within-group effect sizes were small to medium (*d* = .01-.39) for the motivational group. Limitations of these studies included the exclusion of heavy drinkers, and the inclusion of a one-hour assessment for both

groups. Interpretations about the effectiveness of written-only feedback in the absence of a peer or professional intervention are confounded by this initial one-hour interaction.

Extending the research on written feedback interventions, White and colleagues (2008) tested an immediate written feedback condition (*n* = 111) with a two month delayed written feedback condition (*n* = 119). Participants in each condition completed baseline measures and half received feedback while the other half did not. All participants returned in two months, completed the same measures, and were provided feedback. At two-month follow-up (or pre-intervention for the delayed condition), drinking frequency and peak blood alcohol content had decreased for all participants. Heavy episodic drinking decreased only for participants who received immediate feedback, and alcohol-related consequences decreased only for participants in the delayed condition. Effect sizes were small for all groups and all measures (*d* = .08-.29). At seven-month follow-up, drinking frequency and alcohol-related problems decreased for all participants, heavy episodic drinking changes were non-significant, and peak blood alcohol content decreased only for participants in the delayed condition. Effect sizes were again small (*d* = .11-.28). One important finding of this study was that mandated students in the delayed condition decreased their alcohol related behaviors and consequences following a sanction and assessment independent of any intervention. Incident reaction effects will be discussed later.

Next, one study (Amaro, et al., 2009) evaluated an individual intervention (based on BASICS, *n* = 130) compared with treatment as usual, which consisted of either a group education intervention (*n* = 66) or a web-based intervention (*n* = 66). Follow up at six months revealed no significant differences in total consumption, weekend consumption, or BAC, though

endorsing drinking on weekdays decreased for the individual intervention while it *increased* in the treatment as usual condition, and effects on reducing consequences and increasing protective strategies were more successful in the individual condition.

Another series of studies evaluated web-delivered interventions for mandated students. While research with volunteers typically supports the use of web-delivery (Hustad, et al., 2010; C. Neighbors, M. A. Lewis, et al., 2010; Walters & Neighbors, 2011), less is known about its effect with mandated students. The first study tested web-based feedback (www.CheckYourDrinking.com) versus web information only (www.reslife.net) with 46 and 31 mandated students, respectively (Doumas, et al., 2009). Findings indicate significant decreases at 30 day follow up for weekly drinks, peak consumption, and frequency of intoxication with the feedback group decreasing significantly more than the education group on all outcomes, with effects mediated by descriptive norms clarification. There were no significant changes in consequences. Next, they tested web-delivered (n = 32) versus in-person (n = 24) personalized feedback generated from completion of the eChug program (Doumas, Workman, Navarro, & Smith, 2011), and found a significant decrease in weekly drinks, peak consumption, frequency of intoxication, and consequences at 30 day follow up for all participants with no group differences (η^2 = .14-.24), though results should be interpreted cautiously given the small sample, low retention (66%), short follow up, and lack of description of the activities in the in-person 30 minute intervention. Finally, extending the previous research, they tested the same programs with 135 mandated students (81 web-delivered and 54 in-person) with an eight month follow up (Doumas, Workman, Smith, et al., 2011). Results suggested decreases in weekly drinks and binge drinking for in-person participants with corresponding *increases* for

web-based students, with no significant changes in peak consumption or consequences. Further, participants generally overestimated descriptive norms of peers, and norms clarification partially mediated the treatment effect. While this study improved on many of the previous study's limitation, the retention rate was still 61% and randomization produced fairly uneven sample groups.

Another series of studies have evaluated in-person and computerized interventions. The first study (Carey, et al., 2009) evaluated a brief motivational feedback intervention versus a computerized program for a sample of 198 mandated students with follow up at one month, 6 months, and 12 months. Findings suggest better short-term outcomes for the female in-person students compared with the computerized delivery, but no difference for the men. Higher-risk students and those with greater readiness to change decreased their drinking and consequences to a greater degree than other students, with no intervention effects. Students did reduce their drinking and consequences post-sanction but pre-intervention, and the in-person (but not the web-based) intervention accounted for additional reductions. Overall though, the reductions were not maintained at 12-month follow up. Follow up analyses evaluating intervening variables on outcome (Carey, Henson, Carey, & Maisto, 2010), revealing no significant change in readiness to change or injunctive norms over time, though descriptive norms for friends and local students had mixed results. Women in the in-person condition reported significant decreases in perceptions compared to computerized delivery (with no difference between groups for men), and this change was associated with drinking for men and women suggesting mediation for the intervention effect for women. At the local level, both women and men had intervention effects with in-person resulting in significant reductions, but

was only associated with behavior change for men. A final recent study (Carey, et al., 2011) evaluated 677 mandated students across four groups: a brief motivational feedback intervention, two computerized interventions, and a delay control group with follow up at 1 month, 6 months, and 12 months. Findings suggest differences by sex, such that women in the control group reduced their drinking and consequences compared to men in the control group, males reduced their drinking and consequences after each intervention though they reverted to pre-intervention levels over time, and females in the in-person intervention saw greater reductions and maintained them compared to the computerized groups.

Summary: Overall, research supports the use of brief motivational interventions and cognitive-behavioral motivational group interventions with mandated college students, though study limitations complicate interpretations. Findings regarding lack of group differences between active groups (Barnett, et al., 2007; Borsari, O'Leary Tevyaw, et al., 2007; White, Morgan, et al., 2006) and compared to wait-list control (Fromme & Corbin, 2004; White, et al., 2008), combined with tendencies of mandated students to decrease drinking prior to an intervention (Barnett, et al., 2006; Hustad, et al., 2011; Morgan, et al., 2008; White, et al., 2008) highlight the importance of study designs that evaluate pre-intervention changes in drinking patterns. Further, the identification of a "sleeper effect" (White, et al., 2007) for brief interventions illustrates the importance of an ample follow-up period. Instances of iatrogenic effects following an intervention (LaBrie, et al., 2006; Palmer, 2004) also demand particular scrutiny. Additionally, many of the previous studies used group and individual interventions similar to ASTP and BASICS protocols, though deviations from original intervention protocols

were not always apparent. Some studies reported conflicting findings, such as mandated students being higher (Barnett, et al., 2007; Morgan, et al., 2008) or lower (Palmer, 2004; Sharkin, 2007) in readiness to change. No studies published to date have compared in-person group and individual interventions in this population.

Mechanisms of change

In addition to the putative intervening variables discussed above (descriptive and injunctive norms, defensiveness, readiness to change, and sanction reactions), research has investigated myriad other mediators and moderators as they relate to changes in college drinking behavior. While the components in and clinical style of ASTP and BASICS support their use for mandated student populations, there is limited research comparing the effectiveness of these interventions with each other or with education-based programs. Further, limited sample sizes and follow-up periods have reduced the ability to identify mechanisms of change particular to this high-risk population. We will review the following eight putative variables, including the unique association with mandated students: 1) attitudes toward campus policies, 2) readiness to change, 3) intervention satisfaction 4) reactions to the sanctioning incident, 5) defensiveness, 6) norms perceptions, 7) protective behavioral strategies, and 8) alcohol expectancies.

1) **Attitudes toward campus policies:** Research studies evaluating policy implementation have varied in their findings related to drinking behaviors, ranging from little or no impact to actually increasing problems and reactions (Brittain & Roberge, 1998; Gonzalez, 1990;

Schall, 1991; F. G. Williams, 1990). Adding to the complications of evaluating this research is the lack of consistency in policies across campuses (Lenk, et al., 2012). In general, however, greater opposition appears to be associated with stricter policies and with heavier drinking across subpopulations including male, Greek, and mandated students (Colby, Raymond, & Colby, 2000; Garey, Prince, & Carey, 2011; Kilmer, Larimer, Parks, Dimeff, & Marlatt, 1999; Lavigne, Witt, Wood, Laforge, & DeJong, 2008), and students tend to underestimate peer support for policies (Lavigne, et al., 2008; Saltz, 2007).

2) **Readiness to change:** As discussed above, readiness to change tends to be low among heavy drinking college students (Vik, et al., 2000), though its impact on outcomes is inconsistent (Borsari, Murphy, & Carey, 2009; Carey, Henson, Carey, & Maisto, 2007). Mandated students in particular may be less likely to identify a need to change relative to voluntary students who might intentionally seek out treatment (Sharkin, 2007), particularly among men (Carey & DeMartini, 2010), though mandated students higher in readiness to change were more likely to improve following an intervention (Mun, et al., 2009) but had lower self-efficacy in their ability to change (LaChance, et al., 2009).

3) **Satisfaction:** Satisfaction following an intervention has been associated with reduced drinking among both voluntary and mandated students (Palmer, 2004), though this area of research has largely gone unexplored. In general, college students, especially heavy drinking college students, were more likely to evaluate punitive interventions as less effective compared to educational interventions (Thombs, Dimintroff, Wolcott, & Nickel, 1996), and

mandated students expressed more satisfaction with a brief motivational intervention (Borsari, O'Leary Tevyaw, et al., 2007) though other studies demonstrated no differences among groups (LaChance, et al., 2009).

4) **Incident reaction:** Reaction to a specific sanctioning or other aversive alcohol situation has recently become a focus of college student research. One study (Reis, Harned, & Riley, 2004) found that a majority of college students expressed plans to decrease drinking following an emergency room visit due to alcohol use. Further, perceived aversiveness and personal responsibility related to a sanctioning incident were related to increased motivation to reduce drinking (Barnett, et al., 2006), although recent findings suggest that students with low attributions fared less well in an in-person (versus computerized) intervention and perceived aversiveness of the incident only moderated a second booster condition on outcome, such that those with low aversiveness had higher drinking rates following the booster (Mastroleo, et al., 2011). Other findings suggest more serious referrals were related to decreases in drinking prior to an intervention (Morgan, et al., 2008) and that students decreased their drinking similarly in immediate versus two month delayed feedback interventions (White, et al., 2008). While these findings support an association between incident reaction and decreased drinking independent of an intervention, it is important to note that the heaviest drinkers were excluded from participation.

5) **Defensiveness:** Defensiveness appears to be much more pronounced in mandated students than volunteers (Palmer, Kilmer, et al., 2010), and has been associated with less problem recognition, dismissal of health-related information, and decreased motivation in heavy drinkers (Leffingwell, Neumann, Leedy, & Babitzke, 2007; Nye, Agnostinelli, & Smith, 1999; Palmer, Kilmer, et al., 2010). Students higher in defensiveness were less likely to reduce and more likely to potentially increase their drinking following an intervention (Palmer, 2004). Given the unique developmental stage of emerging adulthood, it is possible that the act of mandating students may violate their pursuit of independence and increase defensiveness or reactance. However, one of the functions of MI is to roll with resistance (W. R. Miller & Rollnick, 2002), reduce defensiveness, and increase engagement (L. A. R. Stein et al., 2006).

6) **Norms perception:** As discussed above, overestimation of descriptive drinking norms, or beliefs about how much other individuals actually drink, is associated with increased drinking (Borsari & Carey, 2001, 2003; Larimer, et al., 2004; Lo, 1995; Perkins, 2002a; Perkins & Berkowitz, 1986), particularly for similar reference groups and drinking contexts (Larimer, et al., 2011; Lewis, et al., 2011). Intervention effects were also found (Carey, et al., 2010) such that a brief motivational intervention decreased descriptive norms perceptions about friends in women mandated to treatment, and although there was no intervention effect for men, decreases in perceptions were associated for everyone with behavioral change. Norms clarification also partially and fully mediated treatment effects for mandated students receiving web-based and in-person interventions (Doumas, et al., 2009; Doumas, Workman, Smith, et al., 2011), and accounted for behavior change outside of intervention

effects (Cimini, et al., 2009). Similarly, misperceptions of injunctive norms, or perceived approval of others' towards one's drinking, are also associated with increased drinking, particularly among peer and more similar reference groups (Borsari & Carey, 2001, 2003; Chawla, et al., 2007; LaBrie, Hummer, Neighbors, & Larimer, 2010; Lewis & Neighbors, 2004; C. Neighbors, J. W. LaBrie, et al., 2010; C. Neighbors, Lee, Lewis, Fossos, & Larimer, 2007).

7) **Protective behavioral strategies:** Protective behavioral strategies (PBS) are cognitive-behavioral strategies used to limit alcohol consumption and/or minimize related consequences (Martens et al., 2005), and have been correlated with improvements in prior studies with mandated students (Cimini, et al., 2009) and individual interventions in a mandated population (Amaro, et al., 2009). PBS used while drinking have been associated with reduced alcohol-related consequences among volunteer college students both directly and through a moderating effect between heavy drinking and consequences (Benton et al., 2004; Borden et al., 2011; Delva et al., 2004; Martens, et al., 2005; Martens, Pederson, Labrie, Ferrier, & Cimini, 2007; Martens et al., 2004; Palmer, Corbin, & Cronce, 2010; Patrick, Lee, & Larimer, 2011). Further research has identified the unique roles of specific strategy types and impact on drink reduction, where strategies to avoid activities were associated with decreased consumption but strategies used while drinking were positively associated with consumption (Sugarman & Carey, 2007, 2009), though this research did not evaluate negative consequences of drinking.

8) **Expectancies:** Alcohol expectancies refer to the set of beliefs an individual holds about the effects they will experience when drinking. A strong research foundation supports associations between expectancies and consumption (Fromme, Stroot, & Kaplan, 1993; C. Neighbors, Walker, & Larimer, 2003; Read, Wood, Lejuez, Palfai, & Slack, 2004; Sher, Wood, Wood, & Raskin, 1996; Wood & Sher, 1996), particularly in the context of subjective evaluations (whether the expectancy is considered desirable or undesirable) (Burden & Maisto, 2000; Fromme, et al., 1993; C. M. Lee et al., 2010; Leigh, 1987). Both positive and negative expectancies are associated with consumption, though positive expectancies tend to be stronger predictors of behavior (Greenbaum, Del Boca, Darkes, Wang, & Goldman, 2005; N. K. Lee, Greely, & Oei, 1999; Rohsenow, 1983; Stacy, Widaman, & Marlatt, 1990) and have also been associated with consequences directly (Park & Grant, 2005). Expectancies are also potentially related to emerging adulthood considerations and self-determination, such that they have a stronger impact among those in situations with less control (C. Neighbors, Larimer, & Lewis, 2004). Students with strong endorsements of both positive and negative expectancies may also face additional risks of drinking and consequences (Leeman, Kulesza, Stewart, & Copeland, 2012). Research has indicated that prior experience of consequences may have differential effects on type of expectancy, such that positive effects are seen as more likely and more positive when experienced in the past, but negative effects are seen as less likely and no worse except at high levels of experience (Logan, Henry, Vaughn, Luk, & King, 2011). Further, college students report experiencing positive consequences more frequently than negative (Park, 2004) and overestimate the amount of drinks needed to experience negative effects (Mallett, Lee,

Neighbors, Larimer, & Turrisi, 2006), potentially increasing the relevance of positive expectancies. Prior research (Labbe & Maisto, 2011; LaChance, et al., 2009; Scott-Sheldon, Terry, Carey, Garey, & Carey, 2012; Wood, Capone, Laforge, Erickson, & Brand, 2007) suggests the impact of expectancy challenges to coincide with at least a temporary decrease in positive expectancies and increase in negative expectancies.

Current Study

The current study sought to investigate what was gained and lost in single-session individual and group interventions with this high-risk population, consistent with suggestions for future research published by NIAAA (2002, 2007), DHHS (2007), and individual research groups (White, et al., 2007). Theoretically, this research aimed to test the effectiveness of multiple interventions while considering incident reactivity, delay in treatment, mediators and moderators of outcomes, and specific intervention techniques.

SPECIFIC AIMS AND HYPOTHESES

Aim 1. Evaluate the impact of the sanction on outcomes.

H1a: Mandated students will make reductions in drinking behaviors following a sanction independent of an intervention.

Aim 2. Evaluate the effectiveness of single-session mandated treatment interventions through comparisons of changes in blood alcohol content (BAC), drinking quantity (weekly drinks), and alcohol-related consequences following randomized interventions.

H2a: The Alcohol Skills Training Program (ASTP) and Brief Alcohol Screening and Intervention for College Students (BASICS) interventions will be more effective in reducing drinking quantity and frequency, and related consequences, compared with a treatment-as-usual education-only Alcohol Diversion Program (ADP) (see specific Aims 3 & 4 for proposed mechanisms of change).

H2b: ADP may have an iatrogenic effect on drinking and related harms compared with ASTP and BASICS.

H2c: Increased use of advanced and MI-adherent techniques will be associated with greater decreases in drinking behaviors and consequences.

Aim 3. Examine moderators of the treatment effect, including attitudes toward campus policies, readiness to change, satisfaction with the intervention, and reactions to the sanctioning incident.

H3a: Participants with more negative attitudes toward campus policies will respond less favorably to the interventions, particularly the ADP group.

H3b: Participants higher in readiness to change will respond more favorably to ASTP and BASICS than to ADP.

H3c: Participants who are more satisfied with the intervention will report greater reductions in drinking behaviors.

H3d: Participants who take more internal responsibility, give less external responsibility, and perceive the sanctioning incident as more aversive will benefit more from interventions.

H3e: Increased use of advanced and MI-adherent techniques will be associated with improved attitudes, including greater policy support, increased readiness to change, greater intervention satisfaction, and more internal responsibility.

Aim 4. Examine mediators of drinking behavior reductions, including changes in defensiveness, norms perceptions, protective behavioral strategies, and alcohol expectancies.

H4a: Decreases in defensiveness will be associated with drinking reductions, and BASICS individual feedback will have the greatest impact in reducing defensiveness.

H4b: More accurate norms perceptions will be associated with drinking reductions. The ASTP group format will have the greatest impact on injunctive norms, and BASICS will have the greatest impact on descriptive norms.

H4c: Increases in the identification and use of protective behavioral strategies will be associated with drinking and consequence reductions, and BASICS will have the greatest impact in identifying individual strategies.

H4d: Decreases in positive expectancies and increases in negative expectancies will be associated with drinking reductions, and ASTP groups will have the largest impact in expectancy change.

H4e: Increased use of advanced and MI-adherent techniques will be associated with decreases in defensiveness.

RESEARCH DESIGN AND METHODS

Overview

Participants were randomly assigned into one of three treatment conditions: ASTP, BASICS, or ADP (treatment as usual consisting of a group-format alcohol education presentation by campus police). Participants were compensated for completing voluntary web surveys at baseline, two months, four months, and six months.

Participants (*N* = 61).

Participants were undergraduates at a Southern U.S. campus sanctioned to a clinical program following violation of an on-campus alcohol policy. UT drinking data and consequences reported in campus-wide surveys closely reflect the previously cited national trends. During the 2010-2011 academic year, 208 students identified as violating a campus policy were referred to Judicial Affairs where they met with a graduate law student. Once it was determined they would be referred for ADP, they were given information about the current study and their contact information was forwarded to the research team (RT) following passive consent.

During the span of the study (10/2011-04/2012), 90 names were forwarded to the RT (see Figure 1 for an overview). Of the initial 90, 73 (81.1%) agreed by telephone to participate, while nine declined, three had their sanctions dropped, and the RT was unable to reach the other five by phone or email. Of the 73 who agreed, 61 (83.5%) completed baseline, while 7 later declined, 1 had the sanction dropped, and the RT was unable to reach the other 4 by phone or email. Overall, of the 90 students who gave passive consent at their initial meeting, 4 (4.4%) were later ineligible (due to having their sanction dropped by Judicial Affairs), 16 (17.8%) declined to participate (mostly citing time commitments), and 9 (10%) did not respond to

phone or email messages from the RT, resulting in an overall recruitment rate of 67.8% with 61 participants completing baseline measures.

The 61 participants were randomly assigned to an intervention (ADP *n* = 18, ASTP *n* = 25, BASICS *n* = 18) either immediately or following a two-month wait. Unfortunately, programming delays and suboptimal recruitment resulted in a wait-list sample of only five individuals; thus they were not separated for purposes of analyses. A Goodness of Fit test χ^2 (2, *N* = 61) = 1.61, *p* > .05 revealed successful randomization. Of the 61 participants, 56 (91.8%) completed their assigned intervention, while the other five were referred back to Judicial Affairs at the end of the Spring semester for assignment next year. The five non-completers were assigned to ADP (*n* = 2) and ASTP (*n* = 3), and a test for independence χ^2 (2, *N* = 61) = 2.29, *p* > .05 revealed no group differences in completion. Retention for the voluntary follow up surveys ranged from 68.9% at two-month follow up to 67.2% at four-month and six-month follow ups. Overall, over half of the participants (*n* = 35, 57.4%) completed all follow ups, 6 (9.8%) completed two, 7 (11.5%) completed one, and 13 (21.3%) completed no follow up surveys. The recruitment rate (67.8%) was somewhat lower and attrition (21.3%) higher than our expectations based on comparable studies available at that time with mandated students, which ranged from 86-93% recruitment and 3-4 month follow up at 5-8% attrition (Borsari, O'Leary Tevyaw, et al., 2007; White, et al., 2007), though later studies have demonstrated rates similar to our own (Amaro, et al., 2009; Carey, et al., 2009; Doumas, et al., 2009; Doumas, Workman, Smith, et al., 2011) (see Limitations, below).

Baseline demographics are presented in Table 1. Participants were primarily male (57.4%), heterosexual (100%), and Caucasian (96.7%). Mean age was 19.16 years (*SD* = 1.20). All

students were enrolled full time, with an average reported GPA of 3.34 (*SD* = 0.61) on a 4-point scale. They were primarily freshmen (59.0%) and sophomores (27.9%), lived in residence halls (78.7%), and identified substance-free housing accommodations (78.7%). Over half reported a Greek affiliation (55.7%). Nearly half (42.6%) endorsed having attended an alcohol program at some point in the past (see Table 2).

Measures

All measures were self-report, and collected via web surveys at baseline and at two month, four month, and six month follow up. Reports indicated that among those who completed the surveys during a single login (ranging from 78.0% to 83.3%), the average completion time was 33.17 minutes (*SD* = 9.90) for baseline consent and measures, 27.71 minutes (*SD* = 9.45) for two-month follow up, 25.27 minutes (*SD* = 7.40) for four-month follow up, and 26.50 minutes (*SD* =10.79) for six-month follow up. See Appendix A for an overview of measures at each time point and the measures in their entirety. All measures were selected based on adequate validity and reliability in prior studies with college students and/or for comparability with similar studies of mandated students.

Screening data: Screening data were collected by the judicial officer during the sanction meeting, and consisted solely of verifying that the participant was at least 18 years of age and was not unwilling to be contacted by the RT, who then administered all subsequent measures via web surveys.

Demographics (Appendix A-2-3): Pre- and post-intervention sections collected general (not identifying) information regarding age, ethnicity, sex, year in school, current grade point average, housing situation, and recreational affiliations. Weight was also requested for calculation of approximate blood alcohol content (BAC).

Outcome measures: Drinking quantity/frequency and alcohol-related consequences were assessed though multiple measures.

- *Time Line Follow Back* (TLFB; (Sobell & Sobell, 1992); A-4): assessed actual alcohol use on each day for 30 days pre-incident, up to 30 days post-incident but pre-baseline, and 30 days prior to each follow up period. As post-sanction data was collected for *up to* 30 days (sanction day through the date the measures were taken), averages were obtained to allow comparison with the full 30-day month of pre-intervention data. An average number of drinking days per responded days was calculated and multiplied by 30 for the total monthly drinking days. The total monthly drinking days were then multiplied by the average number of drinks per drinking day to establish total monthly drinks. Of note, while the incident date was included in the calendar, it was not explicitly identified as the date of the infraction. Most participants (68.9%) indicated they consumed zero drinks on the date of the sanction, which is inconsistent with sanctioning guidelines and is likely a result of our oversight to differentiate this specific date from the rest of the calendar.
- *Daily Drinking Questionnaire* (DDQ; (R. L. Collins, Parks, & Marlatt, 1985); A-5-6): a modified version measured average number of standard drinks for each day of the week

as well as time typically spent drinking on each day. BAC was calculated using an equation factoring number of drinks and hours by sex and weight independently for Friday and Saturday, and the greater of the two BAC levels was used to establish a peak weekend BAC. Weekly drinks were calculated by adding the responses for typical drinks on each of the seven days.

- *Rutgers Alcohol Problem Index* (RAPI; (White & Labouvie, 1989); A-7): assessed the frequency of specific problems related to alcohol use within the past two months, yielding α levels of .88, .85, .94, and .93 respectively at baseline, 2 month, 4 month, and 6 month follow up.

Moderators: Putative moderators were assessed to evaluate changes in drinking outcomes as indicated in Specific Aim 3.

- *Policies* (Pol; (Kilmer, et al., 1999); A-8): measured policy support, "I support the substance use policies on my campus," among other items ranging on a 7-point scale from "strongly disagree" to "strongly agree," with higher scores indicating greater support.
- *Brief Readiness to Change Questionnaire* (BRCQ; (Rollnick, Heather, Gold, & Hall, 1992); A-9): assessed readiness to change through 12 statements including "I don't think I drink too much," and "Sometimes I think I should cut down on my drinking," with responses ranging on a 5-point scale from "strongly disagree" to "strongly agree." Precontemplative items (those with no problem recognition) were reverse coded and a mean score obtained, with higher scores corresponding with greater readiness to

change (Budd & Rollnick, 1996; S. E. Collins, Logan, & Neighbors, 2010). Cronbach α levels of .89, .90, .83, and .91 were obtained for baseline, 2 month, 4 month, and 6 month follow up.

- *Satisfaction Survey* (Sat; (Palmer, 2004); A-10): measured program satisfaction ("The information presented was interesting and helpful"), facilitator satisfaction ("The facilitator(s) seemed competent and well-trained"), and intent to change ("I left the program with a specific goal in mind about changing my drinking habits") rated from "strongly disagree" to "strongly agree" on a five-point scale with higher scores indicating more favorable ratings (see Table 3 for full items by subscale). Reliability estimates for the initial satisfaction rating following an intervention are as follows: overall scale (12 items): α = .86; program satisfaction (3 items): α = .72; facilitator satisfaction (4 items): α = .83; and intent to change (3 items): α = .91. These subscales were also separated for analyses due to the increased reliability and specific theoretical value.
- *Incident Reaction* (InRe; (Barnett, et al., 2006); A-11) assessed how the participant views the incident that resulted in the sanction, measuring responsibility, concern, and consequences. Three separate scales were derived from this measure including internal responsibility, external responsibility, and aversiveness of the sanctioning event. Sample items for each subscale include "To what extent do you believe your alcohol consumption was responsible for this incident?" "To what extent was the incident someone else's fault?" and "How unpleasant has this incident been for you?" with responses ranging from "not at all" to "totally" or "completely" on a 7-point scale (see Table 3 for full items by subscale). Reliability estimates for the overall measure and each

subscale at baseline, 2 month, 4 month, and 6 month follow up are as follows: overall scale (9 items): α = .56, .54, .68, and .70; internal responsibility (3 items): α = .68, .83, .85, and .89; external responsibility (2 items): α = .80, .92, .92, and .86; and aversiveness (4 items): α = .88, .84, .87, .84. The subscales were separated for analyses due to the preferred reliability over the entire measure.

Mediators: Multiple mediators were assessed at all time points to evaluate changes in pre- to post-intervention scores as indicated in Specific Aim 4.

- *Defensiveness* (Def-pre and Def-post; (Palmer, 2004); A-12-13) measured resistance to the intervention through 10 items with 7 responses ranging from "Strongly disagree" to "Strongly agree." Items included statements like "I am open-minded about [the intervention]," and "Attending the [intervention] feels like punishment. Post-intervention assessment included the same items but measured in retrospect: "I *was* open-minded about [the intervention]," and "Attending the [intervention] *felt* like punishment." Seven of the items were reversed coded and a mean was calculated with higher scores corresponding to greater defensiveness. Participants automatically received the pre- or post-version depending on their follow up status at each time point. The pre-defensiveness scale yielded α levels of .86 and .88 at baseline and 2 month follow up (calculations for 4 month and 6 month follow ups were not valid as there were only two participants with this measure at each time point). The post-defensiveness measure yielded α levels of .95, .90, and .86 at 2 month, 4 month, and 6 month follow up. Additional questions assessed prospective (and retrospective) interest in attending

different types of interventions (e.g. “an interactive group workshop with peers”), ranging from “very uninterested” to “very interested” on a four-point scale.

- *Descriptive Norms Rating Form* (DNRF; (Baer, et al., 1991); A-14): measured perceived number of daily drinks of reference groups, including best same-sex friends and typical students on campus. A total of weekly drinks was calculated for each group by adding the daily responses.
- *Alcohol Injunctive Norms* (AIN; (Baer, 1994); A-15): measured perceived approval of peers and parents toward individual drinking behaviors, including drinking every weekend, drinking daily, driving after drinking, and drinking enough to pass out. Separate mean scores were calculated for each reference group by averaging the responses, which ranged from “strongly disapprove” to “strongly approve” on a 7-point scale.
- *Protective Behavioral Strategies Survey* (PBSS; (Martens, et al., 2005); A-16): measured strategies to reduce harm from drinking. Participants responded how often they used each of 19 strategies, including “alternate alcoholic and non-alcoholic drinks,” and “avoid drinking games” on a 5-point scale ranging from “never” to “always.” After excluding one item, “drink shots of liquor,” the remaining 18 items were averaged to yield an overall mean at each time point. The PBSS yielded α levels of .93, .93, .94, and .95 for the respective follow ups.
- *Comprehensive Effects of Alcohol* scale (CEOA; (Fromme, et al., 1993); A-17) was composed of two sections related to alcohol expectancies. Participants first indicated the likelihood of experiencing a given effect after drinking such as “I would enjoy sex

more," or "I would feel guilty," and also rating the desirability of that effect. Based on prior research suggesting that participant valence ratings do not always match researchers' theoretical constructs (Mallett, Bachrach, & Turrisi, 2008), separate means were calculated for the perceived likelihood of experiencing positive and negative consequences as they were defined by the individual, such that the mean likelihood (ranging on a 4-point from "disagree" to "agree") was included only if the participant indicated the effect was "bad" or "slightly bad" for negative perceptions and "good" or "slightly good" for positive expectancies. Likelihood for expectancies labeled as "neutral" were not included in these analyses as they were not distinct toward positive or negative valence.

Procedures

Recruitment: When a judicial officer determined that a student was eligible for ADP following existing UT sanctioning procedures, the student received a research information sheet. The judicial officer clarified that only attendance at an intervention was a requirement of the sanction, that participation in the research was completely voluntary, and that judicial personnel would not have access to individual data. If the student was less than 18 years of age, declined contact, chose to not complete measures, or withdrew prior to attending an intervention, the student was excluded from the research and fulfilled the sanction following the existing non-research protocol. Upon receipt of a student's name, phone, and email address (which confirmed that the student was at least 18 and did not decline contact), a member of

the research team (RT) attempted contact through phone and e-mail. If multiple attempts to contact the student were not successful, the student was excluded from the research.

Information and consent: Upon contacting the student, the RT explained the project and addressed any questions. The RT reiterated that participation in the research was voluntary and that judicial staff would not have access to any responses. If the student declined, he/she was excluded from the research and assigned to a non-research program. If the student agreed to participate, the RT explained they would be randomized to an intervention following consent, and would schedule their intervention online either at the end of the baseline surveys, or if in the wait-list group, at the end of the two-month follow up surveys. The RT emailed the student a web link to access the consent form and baseline surveys. After initial consent, participants were retained in the project and intent to treat analyses (J. C. Nelson, 1996) evaluated potential differences between completers and non-completers.

Incentives: Participants had the option of receiving either movie tickets or entry into a drawing for a gift certificate for the first three time points, and received both for the six month follow up. Movie tickets (1 for baseline, 2 for two-month and four-month, and three for six-month follow ups) were mailed following notification of a completed survey. If the student selected entry into a drawing ($250 for baseline and two-month, $500 for four-month, and $750 for six-month), they entered their top three choices of a business they wished to receive a gift card for during completion of their survey. The winners of the drawings (one for each time point) received a gift card to their top choice of a business that did not serve alcohol or beer.

Baseline survey: Upon receiving the survey link, the participant completed the online consent form and questionnaires. The RT sent reminders as needed. As provided in prior research protocols and consistent with published recommendations (C. Neighbors, Pedersen, Kaysen, Walter, & Kulesza, 2012), students reporting a BAC considered potentially dangerous (greater than .30) were sent a separate letter from the RT notifying them of the risks associated with BACs at or above this level and providing them with local campus and community referrals/resources.

Interventions: Participants were randomly assigned into ASTP, BASICS, or ADP and to either the immediate or delayed group. Upon completion of the intervention, the RT notified Judicial Affairs that the sanction was complete, and no further contact occurred between the RT and judicial affairs regarding that student. The RT handled reschedules as needed.

- *Alcohol Skills Training Program (ASTP):* This skills-training approach used MI techniques to focus on drinking in a less dangerous and less risky way (Fromme & Corbin, 2004). The groups were adapted from the published two-session curriculum to a single two-hour session with the following components: Orientation and Building Rapport, Expectancies, Assessment of Use, Alcohol and the Body, Blood Alcohol Level, Biphasic Effects of Alcohol and Tolerance, and Risk Reduction. ASTP interventions had two graduate student facilitators in Fall semester and only one facilitator in Spring. Of the 13 ASTP sessions, the majority (8) had only one participant due to lower-than-anticipated participant flow, while three had 2 participants, one had 3, and one had 5.

- *Brief Alcohol Screening and Intervention for College Students (BASICS):* This non-confrontational, harm reduction approach helps students reduce their alcohol consumption and decrease risks related to heavy drinking (Dimeff, et al., 1999). Graduate student facilitators delivered personalized feedback based on the participant's most recent online responses (baseline for the immediate group, and two-month for the delayed group). Alcohol content, skills-training, and risk reduction plans are introduced throughout the intervention when relevant or of interest. The 18 sessions were conducted 1:1.
- *Alcohol Diversion Program (ADP; treatment-as-usual education group):* ADP was scheduled as a single two-hour alcohol education protocol facilitated by the UT Police Department. Following a PowerPoint format, this intervention covered Signs of Alcohol Poisoning, Symptoms of Abuse, Myths and Facts about Alcohol, Physical and Psychological Effects of Alcohol, Tennessee State Laws on Alcohol, and an Exam. Thirteen of the fourteen ADP groups had only one research participant assigned, though research participants in these interventions were joining groups of non-research participants so a group environment was maintained. While this condition also included alcohol information, it differed from ASTP and BASICS in the absence of an MI clinical technique, risk reduction plans, cognitive-behavioral skills, and norms clarification. Consistent with findings in non-mandated college samples (Cronce & Larimer, 2011), we hypothesized that while ADP would increase alcohol knowledge, it may not produce behavior changes expected in the ASTP and BASICS groups.

<u>Training and supervision:</u> ADP interventions continued to be facilitated by members of the UT Police Department (UTPD) with no supervision by the research team. ASTP and BASICS sessions

were facilitated by UT Counseling and Clinical Psychology graduate students earning practicum credits. We provided a two-day training including motivational interviewing techniques, alcohol information, and demonstrations of providing the interventions for four graduate students at the beginning of the academic year on the UT campus, following training protocols successfully used by UW in training peer educators for previous studies. Consistent with recommendations to maintain and continue supervision of MI skills (Mastroleo, Magill, Barnett, & Borsari, 2012), weekly phone group supervision was provided, supplemented by as-needed e-mail and phone consultation. Undergraduate research assistants were trained in participant recruitment and scheduling, as well as follow-up reminders and incentives. Session coding was completed by two members of the UW Coding Team trained in Motivational Interviewing coding. Coder training was completed over a three month period with an experienced (5+ years) supervisor, ranging from an intensive initial workshop to weekly practice with pre-coded recordings until competence was obtained in identifying utterances, coding specific behaviors, and finally ranking global dimensions. The two coders on this project each had over one year of previous experience.

Treatment fidelity: Audio recordings were received for 35 of the 45 sessions, and all tapes were coded in their entirety by one or two independent coders following the Motivational Interviewing Treatment Integrity (MITI) 3.0 protocol (Moyers, Martin, Manuel, Hendrickson, & Miller, 2005; Moyers, Martin, Manuel, Miller, & Ernst, 2007). Prior studies have established the validity of this measure with undergraduate coders (Pierson et al., 2007). ADP facilitators provided audio for 8 of the 14 sessions that included study participants, with almost half

forgetting to record the session. One of these tapes had to be excluded as only 15 minutes of the session recorded. The remaining seven tapes revealed the average session lasted 46.91 minutes (*SD* = 10.13). It is unknown how many overall participants were in each group as research and non-research participants attended the same group classes, but research participants ranged from 1 to 3 students per group. All thirteen of the ASTP sessions were audio recorded and coded. The average session was 67.11 minutes (*SD* = 14.85) and typically involved only one student (8 programs), while others included two students (3 programs), three students (1 program), and five students (1 program). All BASICS sessions were 1:1 and lasted an average of 45.12 minutes (*SD* = 8.72). Sixteen of the eighteen sessions were recorded and coded while two sessions had tape recorder malfunctions. A one-way ANOVA revealed significant differences in session length based on intervention, F (2, 32) = 10.24, $p < .001$, $\eta^2 = 0.38$. Planned contrasts revealed that BASICS sessions were significantly shorter than ASTP (t = -4.33, $p < .001$, d = -1.51) with no difference between ADP and the experimental groups.

Tapes were coded for MITI Behavior Counts and Global Ratings. Behavior counts included the number of open and closed questions, simple and complex reflections, giving information, and MI-adherent and non-adherent utterances. Global ratings are coded on a 5-point Likert-type scale ranging from 1 = *low* to 5 = *high* and assess facilitator competence in Evocation (attempts to elicit reasons for change rather than imposing reasons), Collaboration (treats the participant as an equal rather than assuming an authority role), Autonomy (supports participant choice rather than trying to control behaviors), Direction (focus on the presenting behavior rather than other topics), and Empathy (show understanding for the participants' perspective rather than being dismissive). Assessment of MI-adherence is identified through

the following calculations: 1) Global Spirit Rating (GSR) is the average of Evocation, Collaboration, and Autonomy subscales; 2) percent open questions (% OQ) is open questions divided by total questions; 3) percent complex reflections (% CR) is complex reflections divided by total reflections, 4) reflection to question ratio (R:Q) is total reflections divided by total questions; and 5) percent MI-adherent (% MiA) is MI-adherent divided by the total of MI-adherent and MI non-adherent behaviors.

Table 4 presents facilitator cutoff levels for basic proficiency and competence, as well as the ratings by each intervention type. As expected, ADP failed to meet beginning proficiency in any of the five categories. ASTP and BASICS interventions met at least beginning proficiency in the majority of categories (GSR, % OQ, and % MiA), but failed to meet competence in the other two (% CR and R:Q). While these findings are less than ideal, they are consistent with real world findings of fidelity when presenting brief interventions for college student drinking. In one study evaluating a sample of nearly 100 BASICS sessions from two randomized controlled trials (Tollison, 2010), the identical pattern was found with facilitators meeting proficiency in GSR, % OQ, and % MiA but failing to meet the threshold for % CR and R:Q. Further analyses (see Table 5) revealed all three BASICS facilitators met proficiency in GSR and % OQ, only one met proficiency in % CR and % MiA, and none met proficiency in R:Q. In ASTP (Table 6), groups provided by two facilitators met proficiency in GSR, % OQ, and % MiA, while the individual facilitators met proficiency in % OQ and % MiA; GSR and % MiA, and no categories, respectively. Overall, while proficiency was met in a majority of categories, it is important to note that these codes suggest the facilitators were not fully competent when providing BASICS, and unique coding guidelines have yet to be developed and standardized for ASTP to assess compliance

with “motivational enhancement” that would capture adherence in the group educational setting.

Descriptives and correlations of individual behavior counts are presented in Table 7. The length of the intervention was significantly positively associated with the number of closed questions, open questions, simple reflections, and giving information counts. Closed questions were associated with simple reflections and giving information, suggesting lower MI-adherence among those variables. Open questions were positively associated with reflections as well as global ratings of evocation, collaboration, autonomy, and empathy. Reflections were negatively associated with the global direction rating, which was negatively associated with evocation and empathy. Each of the global ratings was positively correlated with each other except for direction and autonomy, which were not significantly correlated with each other.

A one-way ANOVA evaluated group differences in MI techniques (see Table 8 and Figures 2 and 3). As MI training was not provided to the campus police for the treatment as usual ADP alcohol education group, we anticipated that those groups would differ from the experimental ASTP and BASICS groups with the MI groups using more complex reflections and open ended questions, as well as having higher adherence ratings. Results indicate overall group differences in open questions F (2, 33) = 5.09, p = .01, η^2 = 0.24, simple reflections F (2, 33) = 3.96, p = .03, η^2 = 0.19, complex reflections F (2, 33) = 4.84, p = .01, η^2 = 0.23, and giving information F (2, 33) = 11.69, p < .001, η^2 = 0.41. Planned contrasts revealed a trend toward fewer instances in ADP of open questions (ADP M = 14.29, SD = 12.65, ASTP/BASICS M = 25.86, SD = 7.98, t(39) = 2.29, p = .06, d = 1.71) and giving information (ADP M = 33.00, SD = 4.76, ASTP/BASICS M = 40.59, SD = 30.58, t(39) = 1.83, p < .09, d = .91). There were also significantly

fewer simple reflections (ADP *M* = 10.57, *SD* = 6.37, ASTP/BASICS *M* = 21.97, *SD* = 10.24, *t*(14) = 3.78, *p* = .002, *d* = 2.02) and complex reflections (ADP *M* = 2.14, *SD* = 3.08, ASTP/BASICS *M* = 9.66, *SD* = 9.98, *t*(26) = 3.55, *p* = .002, *d* = 1.40) in ADP sessions. Complex reflections were also much more common in BASICS (*M* = 13.00, *SD* = 11.68) than ASTP (*M* = 5.54, *SD* = 5.33, *t*(22) = 2.28, *p* = .03, *d* = 0.97), while giving information was more common in ASTP (*M* = 61.92, *SD* = 34.81) than BASICS (*M* = 23.25, *SD* = 7.83, *t*(13) = -3.93, *p* = .002, *d* = -2.18). Notably, there were no differences in closed questions among any of the groups.

Global rating scores also revealed significant differences between groups in evocation, collaboration, and autonomy (with no differences in direction or empathy). Omnibus testing revealed overall group differences in evocation *F* (2, 32) = 7.86, *p* = .002, η^2 = 0.33, collaboration *F* (2, 32) = 9.05, *p* = .01, η^2 = 0.36, and autonomy *F* (2, 32) = 9.34, *p* = .001, η^2 = 0.37. Planned contrasts indicate a trend toward less evocation in ADP (*M* = 2.71, *SD* = 1.11) than ASTP/BASICS (*M* = 3.79, *SD* = 0.83, *t*(8) = 2.26, *p* = .055, *d* = 1.63) and less collaboration in ADP (*M* = 2.71, *SD* = 1.38) than ASTP/BASICS (*M* = 3.93, *SD* = 0.72, *t*(7) = 2.17, *p* = .069, *d* = 1.68). Significant differences included less autonomy in ADP (*M* = 2.71, *SD* = 1.11) than ASTP/BASICS (*M* = 4.00, *SD* = 0.67, *t*(32) = 3.94, *p* < .000, *d* = 1.39), less evocation in ASTP (*M* = 3.33, *SD* = 0.98) than BASICS (*M* = 4.13, *SD* = 0.05, *t*(15) = 2.55, *p* = .022, *d* = 1.31), and less collaboration in ASTP (*M* = 3.50, *SD* = 0.67) than BASICS (*M* = 4.25, *SD* = 0.58, *t*(22) = 3.10, *p* = .005, *d* = 1.33).

Overall, consistent with our expectations, ASTP and BASICS sessions were more MI-adherent than ADP, and BASICS was more adherent than ASTP. Correlations evaluating number of participants and MI techniques yielded no significant overall or intervention-specific relationships. Regarding session length, overall correlations were positive only between

duration and giving information (r = .50, p= .002), closed questions (r = .42, p= .011), and simple reflections (r = .48, p= .003). Among ADP sessions only, the only significant relationship was between session length and simple reflections (r = .78, p= .040). No factors were correlated with duration for ASTP groups. For BASICS, session length was associated with closed questions (r = .60, p= .013), simple reflections (r = .51, p= .044), and complex reflections (r = .71, p= .002).

Follow-Ups

RT members contacted participants by email and phone for follow up assessments at 2, 4, and 6 months post baseline regardless of intervention completion status, although the surveys were delayed due to programming issues for the first cohort of students (n = 15), resulting in follow up periods closer to 3, 5, and 7 months post baseline for these participants. Contact was attempted once or twice per week for up to 6 weeks. Incentives were choice of entry into a drawing for a gift card (to a business that does not serve alcohol) or movie tickets at two and four months, and both drawing entry and movie tickets at six months. Incentives were increased (with IRB approval) when recruitment estimates were reevaluated, though all participants had the opportunity to complete all the measures for the higher incentives (participants that had completed follow ups prior to the increase were automatically compensated at the higher 2 movie ticket rate).

Data Analytic Plan

Our primary goals were 1) to evaluate the efficacy of the three interventions, and 2) test putative intervening variables on the outcome variables of peak weekend BAC, weekly drinks,

and consequences while evaluating the impact of intervention techniques. In order to achieve these goals, a variety of analyses were conducted in both SPSS 19 and HLM 7 (Raudenbush, Bryk, & Congdon, 2011). Using SPSS, correlations were identified between variables of interest. Paired *t*-tests evaluated changes from pre- to post-intervention in drinking behaviors, and one-way analysis of variance (ANOVA) tests evaluated group differences. The majority of the analyses were then conducted using HLM, allowing modeling of trajectories over time (unconditional models) then simultaneous examination of interactions between interventions and time and later intervention techniques (conditional models). HLM provided more robust estimates as list-wise deletion was not necessary to model change, so results were not limited to those who completed all four surveys.

Moderators were then entered into the HLM equations to investigate the role of baseline levels on outcome (Baron & Kenny, 1986). Each moderator variable was evaluated independently to determine 1) the main effect of the IV on the DV; 2) the main effect of the moderator on the DV; and 3) the interaction effect of the IV and the moderator on the DV. Significant interactions were probed at one standard deviation above and below the mean to explore the degree of each moderation effect (Aiken, West, & Reno, 1991). Intervention characteristics were then entered into hierarchical regression analyses as predictors of the putative moderators.

Finally, individual and intervention characteristics were entered to predict mediators, entered as outcome variables, in the final series of analyses. Following the mediation model presented by Baron & Kenny (1986) and later expanded upon (MacKinnon, Fairchild, & Fritz, 2007; MacKinnon, Lockwood, & Hoffman, 1998; MacKinnon, Lockwood, Hoffman, West, &

Sheets, 2002), each mediator variable was evaluated to determine the effect of the independent variable (IV) on the mediator (path *a*) and the effect of the mediator on the DV (path *b*). Mediation was to be tested using the products of coefficients (*ab)* method to obtain an estimate of the indirect effect of the IV on the DV via the mediator (MacKinnon, Lockwood, & Hoffman, 1998); this provides a more powerful test of mediation than the standard causal steps approach (Baron & Kenny, 1986). The standard error of the mediator was to be estimated using the bias-corrected bootstrap standard error (Preacher & Hayes, 2008), which allows an empirical estimation of the confidence interval of the standard error, increasing power and reducing bias introduced by the multiplication of two regression coefficients.

We estimated power based on our overall sample size of *N* = 61 and test-specific sample sizes and groups. Based on G*Power calculations (Erdfelder & Faul, 1996; Faul, Erdfelder, Lang, & Buchner, 2007), we have .80 power to be able to detect medium to large effect sizes for independent means (*d* = 0.74-0.90), large effect sizes for one-way ANOVAs (*f* = 0.41-0.50), and medium to large effect sizes for multiple regression (f^2 = 0.23-0.57) (Cohen, 1992).

Results

All data were screened for outliers and normality. Analyses identified two notable outliers in consequences at four-month follow up. As these consequences were extremely high, and did not correspond with the 0.00 and 0.02 BAC levels reported for the same time frame, they were deleted and treated as missing data. (Of note, most analyses did not vary with the inclusion or exclusion, and differences are noted below when relevant). Square root

transformations were performed for non-normal distributions of the outcome variables of BAC, weekly drinks, and consequences.

Follow up comparisons

Thirty five participants (57.4%) completed all three follow ups, 13 (21.3%) completed some follow up, and the remaining 13 (21.3%) completed no follow ups. As demonstrated in Table 9, an association was found between sex and follow up status χ^2 (2, N = 61) = 8.27, $p < .05$ where non-completers were much more likely to be men (n = 12, 92.3%) then women (n = 1, 7.7%). The other follow up categories were more consistent, with partial completers composed of 6 men (46.2%) and 7 women (53.8%), and full completers composed of 35 men (57.4%) and 26 women (42.6%). Overall, women were more likely to have completed all follow ups (69.2%) than some follow ups (26.9%) or no follow ups (3.8%), while men were more likely to have completed all follow ups (48.6%) or no follow ups (34.3%) than some follow ups (17.1%).

A series of ANOVAs (presented in Table 10) evaluated group differences in transformed BAC, drinks per week, and consequences as well as baseline levels of defensiveness, readiness to change, and incident reaction based on follow up status. There were no significant associations between drinking behaviors or perceptions and follow up status, although there was a trend toward a group difference in aversiveness ratings F (2, 58) = 2.83, p = .067, η^2 = 0.09, with a significant contrast between those completing no follow ups (M = 2.73, SD = 1.43) and any follow ups (M = 3.96, SD = 1.69; t = 2.29, p = .026, d = 0.60). Further analyses also revealed no associations between follow up status and intervention group.

Follow up analyses (see Tables 11-14 for summary) investigated group differences in drinking behaviors and perceptions within intervention type related to completion of each follow up. While there were no differences in baseline drinking behaviors or perceptions among ASTP and BASICS participants who did and did not complete each follow up, a different pattern emerges for ADP participants. First, there was a trend toward ADP participants who completed any follow up consuming less drinks per week at baseline (M = 10.23, SD = 12.41) than those who did not follow up at all (M = 22.00, SD = 14.23; t = 1.91, p = .075, d = 0.95). Although there were no significant differences between ADP participants who did or did not complete the two month follow up, the four month and six month surveys were completed by participants with significantly lower baseline BAC levels (four month not completed M = 0.13, SD = 0.09; four month completed M = 0.04, SD = 0.04; t = 2.99, p <.009, d = 1.49; six month not completed M = 0.12, SD = 0.09; six month completed M = 0.04, SD = 0.04; t = 2.63, p = .018, d = 1.31) and drinks per week (four month not completed M = 25.50, SD = 15.35; four month completed M = 7.50, SD = 7.89; t = 3.20, p <.006, d = 1.60; six month not completed M = 24.29, SD = 14.37; six month completed M = 6.64, SD = 7.66; t = 3.54, p = .003, d = 1.77). Further, again only among ADP participants, those with a greater negative reaction toward the incident were more likely to have completed any follow up (no follow up M = 2.20, SD = 0.21; any follow up M = 4.27, SD = 1.51; t = -4.84, p <.001, d = -2.67) as well as each follow up specifically: at two month (not completed M = 2.57, SD = 1.09; completed M = 4.41, SD = 1.46; t = -2.85, p = .011, d = -1.43), four month (not completed M = 2.13, SD = 0.26; completed M = 4.48, SD = 1.36; t = -5.79, p <.001, d = -3.27), and six month (not completed M = 2.46, SD = 0.93; completed M = 4.48, SD = 1.43; t = -3.30, p = .005, d = -1.65). There were no differences among completers in any group

based on baseline defensiveness, readiness to change, or internal and external incident responsibility.

Pre-post incident changes

H1a: Sanction effects

Paired samples *T*-tests evaluated changes in drinking behaviors prior to an intervention (pre-sanction vs. post-sanction) measured by the TLFB. Pre-incident data was included if all of the 30 days prior had data entered; five cases were excluded for missing data. Post-incident responses included two cases that were excluded for missing data. For the remaining 59 cases, participants responded with number of drinks (including 0) for consecutive days (M = 24.66, SD = 6.63). As described above, these responses were adjusted for equivalence with the 30-day pre-sanction data. These calculations were compared with pre-incident actual total drinks, drinking days, and drinks per drinking day with all variables transformed for normality. Results (see Table 15) indicated significant reductions in total monthly drinks (pre-incident M = 39.09, SD = 40.77; post-incident M = 30.50, SD = 38.70; t = 3.89, p < .001) and drinking days per month (pre-incident M = 7.27, SD = 4.31; post-incident M = 5.66, SD = 4.52; t = 4.13, p < .001), with the decrease in drinks per drinking day only trending toward significance (pre-incident M = 4.39, SD = 2.73; post-incident M = 4.16, SD = 3.19; t = 1.71, p < .10). These findings indicate large effect sizes for the significant changes (d = 1.06 for drinks and 1.12 for drinking days).

Descriptives and correlations

Descriptive statistics and correlations for the main outcomes at each time point are presented in Table 16 and Figure 4. Each outcome was significantly correlated with itself at each time point, and in general BAC and weekly drinks were correlated across time points. There appears to be less of a relationship between later drinking measures and consequences, though baseline and 2 month drinking behaviors were generally associated with consequences.

Correlations between moderators and baseline drinking behaviors are presented in Table 17. Each of the drinking behaviors was significantly correlated, with positive relationships between BAC, weekly drinks, and consequences. Policy support was positively associated with intent to change drinking behaviors following an intervention. Readiness to change was positively associated with consequences, perceived internal responsibility and incident aversiveness, and intent to change, as well as negatively associated with perceived external responsibility. Perceived internal and external responsibility were negatively associated, and program satisfaction was positively correlated with facilitator satisfaction and intent to change.

Descriptives for mediators at each time point (Table 18) and correlations between drinking behaviors and mediators are presented for baseline (Table 19), 2 month (Table 20), 4 month (Table 21), and 6 month (Table 22). Drinking behaviors were positively correlated at baseline and 2 months, but inconsistently associated with consequences at 4 and 6 months. Defensiveness at baseline and each follow up was generally positively associated with injunctive norms, particularly for friends, and negatively associated with PBS. Defensiveness was positively related to all drinking behaviors at 2 months and with consequences at 6 months. Descriptive norms were typically positively associated with each other as well as BAC and weekly drinks. Injunctive norms were also positively associated with each other and

typically negatively related to PBS, and friends' perceived approval was positively related to drinking behaviors and consequences and at times defensiveness and descriptive norms. PBS were negatively related to drinking behaviors at the first two time points only, and negatively associated with injunctive norms later on. Expectancies were positively correlated with each other only at 2 month and 6 month follow ups, and negatively associated with injunctive norms (though positively with PBS) at 4 months.

Finally, there were no correlations between MI techniques or global ratings and drinking outcomes at any time point, though there was a significant positive relationship between baseline drinking and treatment delay (r = .26, p = .05 for BAC and r = .31, p < .020 for weekly drinks), such that those with higher drinking levels waited a longer time for their intervention. As we attempted a randomized waitlist group, we cannot assume a natural relationship though these results could suggest a possibility of heavier drinkers taking longer to schedule and/or no-showing or rescheduling appointments in this mandated population.

Covariates

Independent samples *t*-tests evaluated differences based on binomial covariates in transformed drinking behaviors in Table 23 and in baseline moderators in Table 24. There were no significant relationships between sex or Greek status and BAC, drinks per week, or consequences at any time point with one exception: men trended toward reporting more drinks per week at baseline (M = 13.83, SD = 11.82) than women (M = 7.50, SD = 4.70; t = -1.91, p = .06, d = -0.52). Regarding moderators, men reported significantly higher internal responsibility (men M = 3.61, SD = 1.75, women M = 2.44, SD = 1.13; t = -3.17, p < .01, d = -0.83)

and trended toward lower external responsibility (men *M* = 3.64, *SD* = 1.97, women *M* = 4.58, *SD* = 2.09; *t* = 1.78, *p* = .08, *d* = 0.46) and lower facilitator satisfaction (men *M* = 3.84, *SD* = 0.94, women *M* = 4.27, *SD* = 0.48; *t* = 2.00, *p* = .05, *d* = 0.61). Greek students reported less readiness to change (Greek *M* = 2.64, *SD* = 0.71, Non-Greek *M* = 3.03, *SD* = 0.78; *t* = 2.01, *p* = .05, *d* = 0.52), less internal responsibility (Greek *M* = 2.73, *SD* = 1.46, Non-Greek *M* = 3.59, *SD* = 1.70; *t* = 2.14, *p* = .04, *d* = 0.56), and greater external responsibility (Greek *M* = 4.53, *SD* = 2.19, Non-Greek *M* = 3.43, *SD* = 1.73; *t* = -2.14, *p* = .04, *d* = -0.56).

Outcome changes over time (HLM)

Hierarchical linear models evaluated both outcomes and predictors in four analytic steps. First, correlations between key variables were examined. Second, unconditional analyses were conducted to assess inter-individual variation in initial levels and rate of change over time. Next, all Level 1 and Level 2 predictors were simultaneously tested for intervention effects. Lastly, intervention techniques were included in the final series of tests. For purposes of analyses, birth sex was coded “0” for women and “1” for men. The first intervention comparison, IN_0, compared treatment-as-usual ADP (-1) with ASTP and BASICS (+.5 and +.5). The second intervention comparison, IN_1, compared the Tier 1 interventions with ASTP coded as -1 and BASICS coded as +1. Significant predictors were evaluated for interactions by treatment type and were explored at 1 *SD* above and below the mean.

Step 1: Correlations

The correlation matrix for Level 1 baseline variables and Level 2 variables was provided in Table 17 and discussed above.

Step 2: Unconditional Models

The results from the unconditional models (equation: Y = P0 + P1*(TIME) + E) are included in Table 25. The intercepts at baseline were all significant at $p < .001$, though only two variables demonstrated significant change over time and variance in that change. For BAC, the intercept mean was significant ($M = 0.07$, $SE = .01$, $p < .001$), and varied across individuals (variance component = 0.01, $df = 44$, $\chi^2 = 219.51$, $p < .001$). There was also a significant average decrease over time in BAC ($M = -0.01$, $SE = .00$, $p < .001$) that varied across individuals (variance component = 0.00, $df = 44$, $\chi^2 = 86.08$, $p < .001$). Results for weekly drinks were consistent: the intercept mean was significant ($M = 9.43$, $SE = 1.05$, $p < .001$), and varied across individuals (variance component = 48.62, $df = 44$, $\chi^2 = 176.97$, $p < .001$). There was also a significant average decrease over time in weekly drinks ($M = -0.93$, $SE = .36$, $p < .05$) that varied across individuals (variance component = 2.25, $df = 44$, $\chi^2 = 63.11$, $p < .05$). While the intercept mean ($M = 5.73$, $SE = 0.79$, $p < .001$) and variance (variance component = 23.29, $df = 44$, $\chi^2 = 144.84$, $p < .001$) were significant for consequences, the decrease over time was not significant ($M = -0.49$, $SE = 0.33$, $p > .10$) though the variance component (variance component = 1.77, $df = 44$, $\chi^2 = 74.73$, $p < .01$) suggests different trajectories for participants over time. Analyses run without the outliers excluded were similar with a significant intercept, though change over time and the associated variance component were not significant in that case. Given the better fit with outliers excluded, further analyses were run excluding the two outliers in four month consequences.

Step 3: Conditional Models (Intervention effects)

<u>H2a and H2b: Intervention effects</u>

A series of analyses evaluated intervention effect on drinking behaviors. Table 26 illustrates the results from the comprehensive models evaluating intervention effect on behaviors, examined through the following equations:

Level 1 Model:

$$(OUTCOME)_{ti} = \pi_{0i} + \pi_{1i}*(TIME_{ti}) + e_{ti}$$

Level 2 Models:

$$\pi_{0i} = \beta_{00} + \beta_{01}*(IN\_0_i) + \beta_{02}*(IN\_1_i) + r_{0i}$$

$$\pi_{1i} = \beta_{10} + \beta_{11}*(IN\_0_i) + \beta_{12}*(IN\_1_i) + r_{1i}$$

Results indicated no significant differences between the interventions over time, though the model detected an unequal distribution during randomization such that participants in the BASICS condition drank significantly more drinks per week (M = 11.11, SD = 6.34) than participants assigned to ASTP (M = 9.44, SD = 8.87; t = 2.12, $p < .05$). We attempted to examine age, sex, and Greek affiliation as covariates, but none were significant and results indicated the new model was a poorer fit with our data and were excluded from further analyses.

H2c: MI techniques and intervention effects

Further analyses (Table 27) were run to evaluate the impact of advanced MI strategies on drinking outcomes through the following equations:

Level 1 Model:

$$(OUTCOME)_{ti} = \pi_{0i} + \pi_{1i}*(TIME_{ti}) + e_{ti}$$

Level 2 Models:

$$\pi_{0i} = \beta_{00} + \beta_{01}*(IN\_0_i) + \beta_{02}*(IN\_1_i) + \beta_{03}*(\text{Open Questions}_i) + \beta_{04}*(\text{Complex Reflections}_i) + r_{0i}$$

$$\pi_{1i} = \beta_{10} + \beta_{11}*(IN\_0_i) + \beta_{12}*(IN\_1_i) + \beta_{13}*(\text{Open Questions}_i) + \beta_{14}*(\text{Complex Reflections}_i) + r_{1i}$$

While no differences were identified based on the techniques, an intervention effect was significant for BAC (see Figure 5). These findings suggest that while participants in general decreased their BAC over time, those in the ADP group actually *increased* their BAC following an intervention (slope = 0.006) while ASTP and BASICS participants decreased their BAC (slope = -0.01). These results were limited to the 43 participants with tapes available for coding, compared with the 56 participants available in the conditional models evaluating intervention effects only. In spite of this discrepancy, these findings are particularly compelling given both 1) the small sample size and limited power to detect change, and 2) the tendency for ADP participants with higher BAC to not complete follow up measures. There was also a trend toward significance for an intervention effect on consequences, such that ASTP participants decreased their consequences over time with a slight increase among BASICS participants (see Figure 6).

Moderation

Moderation effects were evaluated for policy support, readiness to change, incident reaction, and satisfaction. Moderators and interaction terms were included in the next series of HLM tests. Significant predictors were evaluated for interactions by treatment type and were explored at 1 *SD* above and below the mean.

Step 4: Conditional Models (Moderators)

As discussed in Specific Aim 3, a final series of analyses evaluated the putative moderators of policy support, readiness to change, incident reactions, and program satisfaction on drinking behaviors through the following comprehensive equations:

Level 1 Model:

$$(OUTCOME)_{ti} = \pi_{0i} + \pi_{1i}*(TIME_{ti}) + e_{ti}$$

Level 2 Models:

$$\pi_{0i} = \beta_{00} + \beta_{01}*(IN\_0_i) + \beta_{02}*(IN\_1_i) + \beta_{03}*(MODERATOR_i) + r_{0i}$$

$$\pi_{1i} = \beta_{10} + \beta_{11}*(IN\_0_i) + \beta_{12}*(IN\_1_i) + \beta_{13}*(MODERATOR_i) + r_{1i}$$

Significant results were then evaluated for an interaction with the intervention group by the following:

Level 1 Model:

$$(OUTCOME)_{ti} = \pi_{0i} + \pi_{1i}*(TIME_{ti}) + e_{ti}$$

Level 2 Models:

$$\pi_{0i} = \beta_{00} + \beta_{01}*(IN\_0_i) + \beta_{02}*(IN\_1_i) + \beta_{03}*(MODERATOR_i) + r_{0i}$$

$$\pi_{1i} = \beta_{10} + \beta_{11}*(IN\_0_i) + \beta_{12}*(IN\_1_i) + \beta_{13}*(MODERATOR_i) +$$
$$\beta_{14}*(IN\_0*MODERATOR_i) + \beta_{15}*(IN\_1*MODERATOR_i) + r_{1i}$$

<u>H3a: Campus policies</u>

While the intercept was significant, there was no significant effect of policy support (Table 28) on BAC or weekly drinks over time. When predicting consequences however, policy support was significant (b = -0.00, SE = .00, $p < .05$) such that lower support for policies at

baseline was associated with a decrease in consequences over time (see Figure 7), although follow up analyses considering the interaction of intervention and policy support were nonsignificant.

H3b: Readiness to change

Again, while the intercept was significant, there was no significant effect of readiness to change (Table 29) on BAC or weekly drinks over time. However, the intercept of readiness to change on consequences was significant (b = 2.33, SE = 1.07, $p < .05$) suggesting that those with higher readiness to change at baseline were also experiencing more consequences, though there was no effect of time.

H3c: Satisfaction

There were significant intercepts between satisfaction and BAC (see Table 30), suggesting that those with higher BAC levels at baseline expressed more facilitator satisfaction (b = 0.26, SE = .01, $p < .05$) but trended toward expressing less program satisfaction (b = -0.03, SE = .02, $p < .10$), with no impact of time. Satisfaction was not related to weekly drinks or consequences.

H3d: Incident reaction

Reactions to the sanctioning incident did yield some significant findings related to alcohol consumption and are displayed in Table 31. Again the intercepts were significant. For BAC, the intercept mean was significant (b = 0.07, SE = .01, $p < .001$), and varied across individuals (variance component = 0.00, df = 39, χ^2 = 194.94, $p < .001$). There was also a significant average decrease over time in BAC (b = -0.01, SE = .00, $p < .01$) that varied across individuals (variance component = 0.00, df = 39, χ^2 = 66.21, $p < .01$). For weekly drinks, the

intercept mean was significant (b = 9.60, SE = 1.01, $p < .001$), and varied across individuals (variance component = 45.35, df = 39, χ^2 = 153.24, $p < .001$). There was also a significant average decrease over time in BAC (b = -0.86, SE = 0.34, $p < .01$) that trended toward varying across individuals (variance component = 1.85, df = 39, χ^2 = 52.77, $p < .07$). For BAC, both external responsibility (b = 0.00, SE = 0.00, $p < .01$) and aversiveness (b = -0.00, SE = 0.00, $p < .05$) were also significant, though no interactions by intervention type were detected. For weekly drinks, only aversiveness (b = -0.34, SE = 0.17, p = .05) was significant, with again no significant interactions identified.

These significant moderators were further examined at 1 *SD* above and below the mean. While all respondents decreased their BAC over time, this change was greatest among students who blamed others less (Figure 8) and found the sanctioned incident more aversive (Figure 9). Similarly, students with a greater negative reaction to the incident decreased their weekly drinking more than their peers (Figure 10). It is important to note that while internal and external responsibility were correlated, internal responsibility did not appear to have an impact on BAC, such that the change was only associated with blaming others.

H3e: MI techniques and attitudes

A series of regression analyses also evaluated the effect of each of the intervention factors (scheduling delay, intervention length, and MI behaviors of open and closed questions, simple and complex reflections, and giving information) on moderators at 6 month follow up. While the intercepts for policy support and readiness to change were significant, none of the predictors were (Table 32). For post-intervention satisfaction (Table 33), there was a positive relationship between intervention length and satisfaction with both the program (β = .66, t =

2.00, $p < .05$) and the facilitator (β = .68, $t = 2.16$, $p < .05$) such that longer programs were rated better. The delay between the incident and the intervention also positively predicted facilitator satisfaction (β = .58, $t = 2.36$, $p < .05$). None of the session features were related to intent to change.

Multiple session behaviors predicted incident reactions at 6 months (see Table 34), and different factors predicted different reactions. For internal responsibility for the incident, intervention length (β = .63, $t = 1.93$, $p < .10$) and closed questions (β = .59, $t = 2.00$, $p < .10$) trended toward positive relationships, while simple reflections (β = -.74, $t = -1.83$, $p < .10$) and giving information (β = -.67, $t = -1.97$, $p < .10$) trended toward negative relationships. In other words, longer interventions and more closed questions predicted increased self responsibility, while more simple reflections and giving information predicted decreased self responsibility. For external responsibility, the delay in scheduling trended toward a negative relationship (β = -.50, $t = -1.99$, $p < .10$), while complex reflections demonstrated a significant negative relationship (β = -.68, $t = -2.96$, $p < .01$) and simple reflections indicated a significant positive relationship (β = .80, $t = 2.21$, $p < .05$). Participants blamed others for the incident less when there was a greater delay before the intervention, and simple reflections increased blame while complex reflections decreased blame. Perceived aversiveness was negatively associated with intervention length (β = -.71, $t = -2.24$, $p < .05$) and complex reflections (β = -.53, $t = -2.22$, $p < .05$), such that longer sessions and more complex reflections resulted in lower perceived aversiveness.

Mediation

H4a: Defensiveness; H4b: Norms perceptions; H4c: Protective Behavioral Strategies; H4d: Expectancies

Descriptive statistics and correlations of the putative mediators are discussed above and presented in Tables 18-22. The mediators included: an overall defensiveness score (which included both pre- and post-intervention defensiveness ratings), pre-interventions and post-intervention defensiveness independently, descriptive norms for friends and same-sex students, injunctive norms for friends and parents, protective behavioral strategies, and positive and negative expectancies. First, unconditional models were evaluated in HLM for each mediator (equation: (MEDIATOR) = P0 + P1*(TIME) + E) in Table 35. All intercepts were significant at $p < .001$, and most had significant intercept variance at $p < .001$ (with the exception of negative expectancies). Results varied more for linear change trends. For defensiveness, there was a trend toward an increase over time for overall defensiveness (b = 0.41, SE = .24, $p < .10$) with no significant linear change in pre- or post-defensiveness. There were also significant variance components for overall defensiveness (variance component = 0.72, df = 9, χ^2 = 619.74, $p < .001$) and pre-intervention defensiveness (variance component = 0.56, df = 12, χ^2 = 222.55, $p < .001$). Descriptive norms had mixed results: perceptions of friend's drinking decreased over time (b = -1.30, SE = .46, $p < .001$) and varied between individuals (variance component = 4.30, df = 44, χ^2 = 70.60, $p < .01$), while perceptions of general students' drinking decreased over time (b = -1.01, SE = .46, $p < .05$) with no variation between participants. For injunctive norms, friends' approval did not change significantly over time but did vary between individuals (variance component = 0.06, df = 44, χ^2 = 80.60, $p < .001$), while parental approval trended toward increasing over time (b = 0.06, SE = .03, $p < .10$) with no

variation between participants. Protective behavioral strategies were not significant for change over time or variation. Finally, while positive expectancies trended toward a decrease over time (b = -0.17, SE = .08, $p < .10$) the variation was non-significant, while negative expectancies showed no linear change but trended toward variation (variance component = 0.08, df = 44, χ^2 = 57.88, $p < .10$).

In sum, overall defensiveness and parental injunctive norms trended toward increasing over time, positive expectancies trended toward a decrease, and perceptions of students' and friends' drinking norms both significantly decreased. Significant variance was detected for overall defensiveness, pre-incident defensiveness, perceptions of friends' drinking, perceptions of friends' approval of drinking, and (a trend toward) negative expectancies. Mediators with significant variance were evaluated for intervention effects, controlling for the covariates of age, sex, and Greek affiliation (Table 36). Overall defensiveness yielded a significant interaction between MI intervention group and time, suggesting that defensiveness increased more for participants in BASICS over time (b = 0.08, SE = .04, $p < .05$), though the non-significance of the variance component of time suggests that individuals may not have had great variability once controlling for the covariates. A series of ANOVAs explored differences in individual defensiveness scale items at 6 months by intervention group. There was only one significant item that varied by assigned group: "Attending the [intervention] felt like punishment to me," F (2, 36) = 4.87, p = .013, η^2 = 0.21. Contrast tests revealed that BASICS participants agreed much more strongly that the session felt like punishment (M = 5.58, SD = 1.08) than ASTP participants (M = 3.81, SD = 1.52), t(36) = 3.00, p = .005, d = 1.00. Further review revealed no significant differences in paired sample t-tests evaluating prospective interest in BASICS (one-to-one

feedback session, *M* = 1.89, *SD* = 0.95), ADP (classroom-format education group , *M* = 2.00, *SD* = 0.95), and ASTP (interactive group workshop with peers, *M* = 2.07, *SD* = 0.95) as potential interventions, though overall interest was low for all conditions.

For pre-intervention defensiveness, the variance component was significant at $p < .001$, and results suggest significant impacts of intervention ($b = -0.57$, $SE = .23$, $p < .05$), age ($b = -0.34$, $SE = .13$, $p < .05$), sex ($b = -2.37$, $SE = .43$, $p < .001$), and Greek affiliation ($b = -0.76$, $SE = .30$, $p < .05$), with defensiveness increasing more for ADP participants, younger students, men, and Greeks (Figure 11). Perceptions of friends drinking behaviors and approval, as well as negative expectancies all suggested sex effects ($b = -2.18$, $SE = 1.17$, $p < .10$; $b = -0.34$, $SE = .13$, $p < .05$; $b = -0.53$, $SE = .20$, $p < .05$, respectively) with men's descriptive norms increasing less, injunctive norms decreasing more, and negative expectancies increasing less than women's responses (see Figure 12). While the norms models demonstrated significant variance over time ($p < .05$ for descriptive and $p < .01$ for injunctive), the variance component of negative expectancies over time was not significant.

H4e: MI techniques and defensiveness

Two further analyses were conducted to investigate potential effects of intervention techniques on defensiveness. First, regression analyses evaluated the effect of each of the intervention factors (scheduling delay, intervention length, and MI behaviors of open and closed questions, simple and complex behaviors, and giving information) on defensiveness at each follow up (Table 37). At 2 month follow up, there was a trend toward fewer simple reflections predicting lower defensiveness ($\beta = .12$, $t = 1.95$, $p < .10$), while 4 month follow up indicated a trend toward longer sessions and decreased defensiveness ($\beta = -.60$, $t = 1.75$, $p <$

.10). Finally, at 6 month follow up, there were significant negative association between intervention length and defensiveness (β = -.71, *t* = 2.24, *p* < .05), and between complex reflections and defensiveness (β = -.53, *t* = 2.22, *p* < .05), such that longer sessions and more complex reflections were associated with lower defensiveness.

Finally, HLM analyses evaluated the impact of advanced MI techniques on defensiveness through:

Level 1 Model:

$$(\text{DEFENSIVENESS})_{ti} = \pi_{0i} + \pi_{1i}*(\text{TIME}_{ti}) + e_{ti}$$

Level 2 Models:

$$\pi_{0i} = \beta_{00} + \beta_{01}*(\text{IN\_0}_i) + \beta_{02}*(\text{IN\_1}_i) + \beta_{03}*(\text{Open Questions}_i) + \beta_{04}*(\text{Complex Reflections}_i) + r_{0i}$$

$$\pi_{1i} = \beta_{10} + \beta_{11}*(\text{IN\_0}_i) + \beta_{12}*(\text{IN\_1}_i) + \beta_{13}*(\text{Open Questions}_i) + \beta_{14}*(\text{Complex Reflections}_i) + r_{1i}$$

Table 38 and Figure 13 indicates significant effects of the MI interventions (*b* = 0.10, *SE* = 0.05, *p* < .05) and complex reflections (*b* = -0.01, *SE* = 0.00, *p* < .05), with a trend toward open questions as well (*b* = 0.01, *SE* = 0.00, *p* < .10), though the variance component of time was not significant.

Discussion

Prior research in mandated student alcohol interventions has demonstrated inconsistent outcomes, though generally favors motivational enhancement strategies and in-person delivery either in group or individual settings. The goal of the current study was to evaluate the efficacy of a group intervention (ASTP), an individual intervention (BASICS), and

treatment as usual alcohol education (ADP), in addition to evaluating pre-intervention behavior changes and identifying intervening variables specific to the mandated population. Our results indicated a reduction in drinking behaviors prior to an intervention (i.e., in reaction to the sanction event), as well as a potential iatrogenic effect of the ADP group in one analysis, with BAC increasing following the ADP intervention compared with the overall decrease among participants in other conditions. ASTP outcomes were most favorable at two months with a trend toward fewer consequences over time, with no group differences in consumption maintained at four and six months. While no direct effects were found for the putative moderators of policy support, readiness to change, or program satisfaction on consumption, two incident reaction variables were significant: both lower blame for others and greater aversiveness of the incident were associated with greater decreases in drinking over time. Lower baseline support for policies was related to fewer consequences over time, and greater readiness to change was related to greater consequences at baseline. Finally, while sex differences were noted in some of the proposed mediators (men tended to increase descriptive norms less, decrease injunctive norms more, and increase negative expectancies less), none had an impact on drinking behaviors. Pre-intervention defensiveness increased more for younger, male, and Greek students as well as those assigned to ADP, while defensiveness assessed at each time point increased more for BASICS than ASTP participants. Specific MI techniques such as complex reflections were associated with lower defensiveness but had no direct influence on drinking outcomes. Overall, these results indicate that a one-size-fits-all approach to mandated students may not be clinically beneficial, as some students appeared to

improve while others did not, even in the same intervention groups. Primary findings will be discussed individually below.

Our results indicated few intervention effects, with the exception being an increase in BAC following an ADP intervention compared to decreases among ASTP and BASICS participants. These findings are consistent with prior research identifying better outcomes among interventions with an MI component in mandated populations (LaChance, et al., 2009; White, et al., 2007) and potential iatrogenic effects among education only and/or web only programs (Amaro, et al., 2009; Doumas, Workman, Smith, et al., 2011; Terlecki, et al., 2010). Although many studies have found no differences between completers and attriters (Carey, et al., 2009; Doumas, Workman, Smith, et al., 2011), our findings were consistent with other studies noting a differential lack of follow up among heavier drinkers (Cimini, et al., 2009), particularly in conditions with little to no motivational enhancement components (LaChance, et al., 2009). Compliance and willingness to follow up is fairly complex in a mandated population and studies vary between which follow ups are required and which are optional based on existing sanctioning procedures. For example, in our study, only participation in an intervention was required to fulfill the sanction and all surveys were optional. Other studies require completion of baseline and some follow up with later follow ups being optional (Carey, et al., 2011), and others require all follow up periods for sanction fulfillment (LaBrie, et al., 2007). Thus, comparisons between studies are complicated as motivation levels may vary significantly but not be captured by retention and completion rates. Overall, given the differential follow up of heavy drinking ADP participants in our sample, our findings of an iatrogenic effect are even more remarkable, suggesting an increase in drinking particularly among those at lower initial

levels, though this finding could also be interpreted as regression to the mean. These findings are also consistent with the risk of iatrogenic effects in peer group interventions, particularly among high-risk adolescents (Dishion, McCord, & Poulin, 1999; Dishion, Poulin, & Burraston, 2001; Moos, 2005) and in mandated populations (LaBrie, et al., 2006; LaBrie, et al., 2007). Given the time- and cost-effectiveness of group interventions, further studies are needed to assess the impact of groups in mandated populations.

Our results also suggest that ASTP outperformed BASICS over time, with decreases in consequences and defensiveness among ASTP participants compared to BASICS participants. There are a couple of potential explanations of these findings. First, ASTP sessions were significantly longer than BASICS sessions, and longer session length predicted greater program and facilitator satisfaction as well as decreased defensiveness over time. Most prior studies have evaluated programs with equal time requirements, though studies evaluating randomized booster sessions have suggested differential findings with additional requirements resulting in iatrogenic effects among men and participants with low incident aversion (Mastroleo, et al., 2011). These findings suggest that while extremely brief interventions may be effective in volunteer college students (Kulesza, et al., 2010), mandated students may require additional interaction for optimal outcomes. However, more in depth or personally tailored interventions and booster sessions may actually be contraindicated and lead to increases in defensiveness and poorer outcomes when mandated students feel they are getting too much attention that is not consistent with their concern over their drinking, though they continue to be more effective for students with more problems and more serious incidents (Mun, et al., 2009). Though this is a possible explanation, it is important to again note that while our facilitators met proficiency

on most categories, they did fail to meet full competence across the board and thus any reactions could have been a result of inadequate motivational interviewing techniques. It is also possible that mandated students comprise heterogeneous clusters rather than a homogenous subpopulation, like the "Why Me," "So What," and "Bad Incident" groups identified in previous research (Barnett, et al., 2008), and thus receive differential benefits of specific interventions.

Another important factor appears to be the sex of the mandated student. Prior findings indicate that women were more likely to improve following an intervention (Carey, et al., 2009; Mun, et al., 2009), had lower resistance and greater readiness to change (Carey & DeMartini, 2010), were more influenced by friends' descriptive norms (Carey, et al., 2010), reduced consumption even in a control condition and maintained reductions over one year following a brief motivational intervention (Carey, et al., 2011), while men increased their drinking following a booster session (Mastroleo, et al., 2011), were more influenced by students' descriptive norms (Carey, et al., 2010), and initially reduced but reverted following interventions (Carey, et al., 2011). Studies indicating positive outcomes in mandated samples of men have been single group studies lacking a control or comparison group (LaBrie, Cail, et al., 2010; LaBrie, et al., 2006), undermining any causal inferences. While the outcomes in our study were not influenced by sex directly, we did find that men showed greater pre-intervention increases in defensiveness, had lesser increases in descriptive norms and greater decreases in injunctive norms estimates, and had a lesser increase in negative expectancies over time. Men also reported significantly higher internal responsibility and trended toward lower external responsibility and facilitator satisfaction compared to women. These differences are somewhat contradictory given that men's responses are favored in terms of norms and external

responsibility while women's are favored in defensiveness and satisfaction (related to intent to change). It is important to note, however, than sex was not associated with any outcomes in this study, which is likely due to our limited power and unequal proportion of men given that additional women is associated with greater effect sizes in intervention studies (Carey, Scott-Sheldon, et al., 2007). Further, men were less compliant and less likely to follow up in our study as well as others (Cimini, et al., 2009), making comparisons more difficult.

While some of our intervention effects were significant, we also note that the majority of our intervention effects found no group differences. This is again consistent with prior research (Amaro, et al., 2009; Borsari & Carey, 2005; Borsari, O'Leary Tevyaw, et al., 2007; Cimini, et al., 2009; Doumas, Workman, Navarro, et al., 2011; O'Leary Tevyaw, et al., 2007), particularly studies such as the current comparing active treatment groups with limited sample sizes, and could likely reflect a lack of power to detect change when evaluating small effect sizes. It is also possible that there are no actual intervention effects, and consistent with our findings, mandated students tend to decrease their drinking prior to and independent of an intervention; thus these changes happen naturally over time either due to the incident itself (Barnett, et al., 2006; Hustad, et al., 2011; Morgan, et al., 2008), or to natural development (Labouvie, 1996; Misch, 2007). Other explanations for a lack of intervention effects come from recent studies that have questioned the reliability of mandated student self-report, particularly at pre-intervention time points (Walker & Cosden, 2007). In this study, participants' self-reported drinking levels were lower prior to attending sanction groups than when they re-reported levels for the same period after attending. Qualitative discussions revealed that students were worried about additional penalties or sanctions if their full drinking levels were

revealed, but became less concerned during and after their sanction. In addition to intentional misrepresentation, unintentional estimate errors should also be considered, as studies have also indicated that students tend to underestimate number of drinks consumed but correct these estimates following standard drink education such as that provided in all of our interventions (Bergen-Cico & Kilmer, 2010). Thus, it is possible that our lack of intervention effects could be due to intentional or inadvertent initial underestimation of drinking behaviors, though it is notable that BAC and weekly drinks significantly decreased over time. However, studies with waitlist delay groups suggest there is at least some intervention influence in addition to the pre-session changes (Carey, et al., 2011; White, et al., 2008).

Given the general discrepant findings in mandated research, our study sought to identify mechanisms of change, including both individual factors as well as intervention techniques. Defensiveness toward the intervention has received particular attention in mandated research (Palmer, 2004; Palmer, Kilmer, et al., 2010). Our findings indicate that defensiveness was positively associated with drinking outcomes at two months and consequences at six months, such that greater defensiveness was correlated with increased drinking and consequences. Defensiveness was also positively associated with perceptions of friends' injunctive norms, and negatively associated with PBS. Overall defensiveness increased over time, and increased more in BASICS than ASTP. As discussed above, students showed the least interest in our description of a BASICS session at baseline (pre-randomization), and BASICS participants tended to view their session as punishment more than ASTP participants. It is also possible that providing both self-focused and normative feedback simultaneously may have increased defensiveness in BASICS (Nye, et al., 1999), requiring greater use of advanced MI techniques to avoid

confrontation and roll with resistance. Defensiveness was initially positively associated with simple reflections, consistent with other studies identifying an iatrogenic effect associated with a greater proportion of simple reflections (Tollison et al., 2008). Overall defensiveness was negatively associated with session length (favoring ASTP) and complex reflections (favoring BASICS). Taken together, these findings suggest that mandated students responded better to a longer structured program with an MI focus, though increases in defensiveness were potentially offset in a brief intensive session through increasing advanced MI techniques. Pre-intervention defensiveness levels were also notably influenced by type of intervention (with greater increases in ADP participants) as well as sex, age, and Greek affiliation (with greater increases among male, younger, Greek students). Results suggest that scheduling and completing interventions sooner with these high-risk groups may have better outcomes.

Policy support in our study was positively correlated to intent to change at baseline, though support had a surprising effect on consequences over time, such that those with low policy support decreased their consequences significantly with no change (or a slight increase) among those reporting higher support. Previous research has demonstrated lower policy support among mandated students in general, and that lower support tends to be associated with greater consumption (Garey, et al., 2011; Kilmer, et al., 1999; Lavigne, et al., 2008). One possible explanation for these surprising findings is that students with the least policy support might have been more distrustful of the process and research, and consistent with prior studies (Walker & Cosden, 2007), have minimized consequences for fear of additional sanctions. Another possible explanation is that students with lesser support already began the reduction in their consequences trajectory following the sanction (given that they were likely heavier

drinkers at the time). We are unable to explore this possibility as consequences were not evaluated separately for pre-incident levels nor were initial reports reconfirmed later, though this would imply that heavier drinkers with greater consequences had begun to independently reduce their consequences, thus having less support for external policies, and we merely picked up on the trajectory after initial changes were made. This theory is further supported by our finding that consequences were higher at baseline among those with greater readiness to change. This is consistent with prior studies indicating greater pre-incident consumption was related to greater readiness to change (Barnett, et al., 2006) which was related to greater pre-intervention decreases (Carey, et al., 2009). Readiness to change in our sample was also related to increased internal responsibility, incident aversiveness, and intent to change, and negatively associated with external responsibility. However, readiness to change did not vary over time or between individuals in our sample, and did not impact outcome variables. Given the questionable predictive value of readiness to change (Borsari, et al., 2009; S. E. Collins, et al., 2010) and inconsistencies in our findings, as well as the absence of a theory-driven rationale, caution is recommended with any possible interpretations.

Our results indicate that satisfaction with the program was positively associated with facilitator satisfaction and intent to change. Further, those with higher program satisfaction trended toward lower BAC levels at baseline, though those with higher facilitator satisfaction had higher BAC levels. Our lack of intervention differences on satisfaction is consistent with the literature on mandated students indicating little to no difference in ratings between groups (Borsari, O'Leary Tevyaw, et al., 2007; LaChance, et al., 2009), though may again be a result of limited power between active conditions. It is also possible that those least satisfied were less

likely to follow up, specifically in the ADP condition with differential lack of follow up among heavy drinkers. Regardless, satisfaction with the intervention and facilitator has been greatly understudied in this population and warrants further investigation.

Incident reactions were particularly relevant to other attitudes and behaviors in our study. Internal and external responsibility were negatively correlated with each other but unrelated to incident aversiveness. Internal responsibility and aversiveness were positively associated with readiness to change, while external responsibility was negatively correlated with readiness to change and weekly drinks. Barnett and colleagues (2006) found that internal responsibility influenced readiness to change through increased aversiveness, our results suggest that internal responsibility and aversiveness were independently related to readiness to change. It is important to note that the majority (82%) of referrals in the original study were medical or more serious referrals, while all of ours came from judicial referrals and thus were likely to have lower responsibility and aversion ratings. Our findings related to external responsibility where students who blamed others more decreased their drinking less over time is consistent with engagement in and openness to treatment. Blame is indicated as one form of resistance specifically targeted by MI (W. R. Miller & Rollnick, 2002), and thus could reduce potential benefits of a brief intervention or individual change. Finally, greater perceived aversiveness was associated with greater decreases in drinking behaviors, consistent with better outcomes in previous studies (Barnett, et al., 2006; Mastroleo, et al., 2011; Morgan, et al., 2008). Complex reflections were associated with less external responsibility but also less incident aversiveness, while simple reflections were associated with greater blame and trended toward lesser internal responsibility. These findings have important clinical implications: 1)

attitudes appear to be influenced by advanced MI techniques designed to reduce resistance and defensiveness; 2) however facilitators must be cautious to only reduce perceptions positively associated with outcomes (e.g. blame) while developing discrepancy and maintaining perceptions that are negatively associated (e.g. aversiveness); and 3) an increase in self-responsibility does not appear necessary for behavior change, at least among less severe judicial referrals. In other words, mandated students don't need to take responsibility for the incident to have better outcomes – they only need to blame others less.

This study also examined intervention-specific factors related to group differences, behaviors, and attitudes of participants. There were no differences in closed questions between the groups, and open questions only neared significance with fewer noted in the ADP condition. ADP had significantly fewer simple and complex reflections, and neared significance of giving less information. ASTP conditions had significantly fewer complex reflections and gave significantly more information than BASICS. Regarding global ratings, evocation, collaboration, and autonomy showed increases from ADP to ASTP and from ASTP to BASICS, with ADP demonstrating superficial or discouraging levels. Of note, there were no differences in global levels of direction or empathy indicating that even without MI training, facilitators generally give instruction and empathize with participants. It is particularly important to note the intersection of increased MI skills as well as the interpersonal focus apparent in our conditions, supporting findings that both processes and spirit influence outcome (W. R. Miller & Rose, 2009). While prior studies have suggested that MI alone is not sufficient for behavior change (Walters, Vader, Harris, Field, & Jouriles, 2009), the significant findings in our study support the

wealth of prior research suggesting it is commonly an active ingredient in interventions with optimized outcomes (Cronce & Larimer, 2011).

Limitations

In addition to the strengths and contributions of this study, a number of limitations should be noted and discussed. First, sample size was notably smaller than originally anticipated. A few factors contributed to the lower recruitment: 1) Staff turnover at our collaboration site resulted in miscommunication and ultimately changed the referral protocol, reducing our potential pool of subjects by 119 referrals that were assigned to a computerized program instead of being notified about our study. 2) In spite of our specific script and recruitment protocol, initial strategies also appeared inconsistent as the ratios of students giving passive consent varied greatly between the four legal students holding the initial sanction appointments (initial responses showed three students received one decline each, while the fourth received nine in the same period of time and number of potential subjects). While we provided additional instruction, overall rates were unfortunately not available to the researcher to evaluate whether recruitment moved toward similar rates, nor were we able to identify any potential characteristics of the participant sample that was initially lost). 3) Potential miscalculation of recruitment and retention rates also may have played a role. Based on the research available at the time of the proposal, recruitment and retention rates were quite substantial in mandated student research (ranges from 86-93% recruitment and 3-4 month follow up at 5-8% attrition (Borsari et al., 2007; White, et al., 2007), though more recent studies have been quite variable and reflect rates closer to our own of 68% and 79%

(recruitment rates of 39%, 65%, 72%, and 95%, and retention rates of 83%, 70%, 88%, 61%, respectively) (Amaro, et al., 2009; Carey, et al., 2009; Doumas, et al., 2009; Doumas, Workman, Smith, et al., 2011). Other studies have failed to provide recruitment rates for their mandated samples (Cimini, et al., 2009; LaChance, et al., 2009), making comparisons not possible. These differences in recruitment and an almost inverse relationship with retention is likely a reflection of variability in sanction protocol, researcher affiliation (counseling centers, psychology departments, etc.), and to an extent, participant factors and behaviors. This sample size limitation resulted in drastically decreased power to detect change in our sample. While our original estimates were to identify a small effect size for our randomized groups, our sample size indicates that we were limited to primarily large effect sizes for each of our tests. Large effect sizes are very unusual in mandated student intervention outcomes, particularly when comparing active interventions. As such, any null findings are equally likely to have been caused by no significant differences or our limited power to detect true change.

A second limitation was the absence of a randomized waitlist or true control group. Our original intention to provide a 12 week delay control group was shortened to an 8 week proposal in order to accommodate our collaborators' request to complete sanctions in the same semester whenever possible. An eight week delay would have allowed for recruitment for the first half of each semester, but due to programming delays we were unable to randomize to the control condition in the Fall, and only five participants consented, completed baseline, and were randomized before the Spring deadline. As such, no comparisons of immediate versus control conditions were possible, though treatment delay was tested and controlled for in our analyses. This artificial waitlist confounded the natural scheduling process though, so it is not

possible to differentiate any participant characteristics associated with delaying completion of an intervention. Additionally, while our attempt at a waitlist condition was thought to best estimate a true no-treatment control, as the potential harm of denying a supported intervention is too great as to outweigh any potential benefit for research, it must be noted that no mandated student research has been performed with a true control group and cannot therefore differentiate naturalistic changes or changes surrounding the sanctioning process itself. It is equally plausible that the reductions in drinking represented natural development (Labouvie, 1996; Misch, 2007) or was the result of some unmeasured external variable.

Third, there may have been response bias between participants who declined to participate as they might differ in drinking patterns and defensiveness from participants who agreed to participate. Given the importance we placed on informed consent and voluntary research, combined with adequate incentives and institutional and geographical separation between the RT and the recruitment sample, we expected declines to be minimal. However, we have no behavioral information on those who chose to not participate, and due to a change in data collection within the judicial system, we also do not have demographic information available as we had anticipated. Response bias may have been a further concern due to the participant's interaction with the judicial system, with potential influences from being sanctioned in general to the setting and tone of meetings with individual judicial staff. While it was possible that participants may have minimized their responses for fear of additional sanctions, every attempt was made to clarify the independent roles of the judicial system and the research team, and to reiterate that judicial employees would not have access to individual data. We did not include the more expensive and invasive options of collateral verification or

biological methods as prior research has supported the accuracy of self-report (Babor, Steinberg, Anton, & Del Boca, 2000; Babor, Stephens, & Marlatt, 1987), and more specifically web-based self-report (E. T. Miller et al., 2002) with college-age samples. However, as described above, recent studies have questioned the accuracy of retrospective summaries of drinking behaviors (Patrick & Lee, 2010) and of mandated student drinking reports specifically (Walker & Cosden, 2007).

A fourth limitation was the homogeneity of this specific sample. Although 83.9% of undergraduate students in 2010-2011 identified as Non-Hispanic Caucasian, previous years' data of judicial referrals indicates that 95% of mandated students identify as Non-Hispanic Caucasian (2% identified as Asian/Pacific Islander, 2% identified as African American, and 1% identified as Hispanic). While Non-Hispanic Caucasian participants were over-represented in this sample, no outreach or recruitment strategies were planned due to the nature of the mandated population. For this project, under-representation is associated with fewer violations of campus policies. While campus data were not available on other demographic markers, our response rates of 100% heterosexual also significantly limits generalizability. Further, freshmen and sophomores were overrepresented in our study (86.9% versus 46.3% campus wide), though this is consistent with other mandated studies where students tend to be younger (under the minimum legal drinking age of 21) and more likely to live on campus and thus fairly accurately reflected the specific subpopulation. Another limitation to generalizing to other mandated populations reflects differences in sanctioning guidelines and procedures. We did not record the referral source or specific information about the incident or interactions with judicial or residential staff, all of which may have impacted defensiveness, incident reaction,

and other putative intervening variables including the decision of whether to participate or not, and vary considerably depending on the institution.

Fifth, temporal limitations should be addressed. Programming delays resulted in no recruitment until mid-October, thus the first six weeks of the academic year yielded no participants. Due to similar delays, the two month follow up surveys were not available until closer to three months for the first set of participants (and then were administered every other month after that point), and thus may not represent true patterns of behaviors and attitudes at eight weeks post baseline. Further, baseline surveys were completed at varying times from the initial incident. Thus, changes identified pre-intervention may not be identical across subjects, as some completed baseline measures within a 1-2 weeks and others were completed months after the incident (days between the incident and baseline completion ranged from 11 to 249, M = 39.7, SD = 34.9). Also, pre-intervention changes were limited to number of drinks, drinking days, and drinks per drinking day without a differential assessment of consequences or other related behaviors or attitudes. Given the variability of the baseline assessment point, it was not feasible to retrospectively assess consequences and other factors pre-incident, although for many subjects, the previous two month time frame would include both pre-incident and post-incident data. Next, although participants were asked about typical behaviors in the past two months, due to the rolling nature of the follow up surveys, some respondents at some time points would have had their responses potentially impacted by event-specific situations including winter and summer break as well as holidays and birthdays (C. Neighbors, et al., 2011) as well as more general temporal changes throughout the semester (Del Boca, et al., 2004) that may have impacted both their estimated and actual levels of drinking. Finally, due to our failure

to specifically label the incident date to aid in the participants' memory, we were unable to assess the drinking behaviors on the day of the incident for comparison with typical drinking behaviors.

Sixth, our outcome variable decisions limit our generalizability to students' drinking patterns. While much effort and thought went into capturing variables we felt best represented drinking while minimizing the risk for multiple analyses and Type 1 errors, we ultimately selected and computed some variables at the expense of others. Specifically, we chose to use "peak weekend BAC" as our primary BAC outcome, and as described above in Measures, retained the greater of the two weekend nights' BAC levels. We believe this calculation to be a better estimate compared to averaging or summing (for example, there would be no difference between two participants reporting BAC levels of 0.08 each night or .00 and 0.16). Thus, calculating peak weekend BAC allowed greater sensitivity to detect changes in patterns, though we lost the ability to detect overall weekend changes or number of drinking days. Further, our decision to calculate drinks per week ignores obvious factors such as sex, weight, and drinking time which would all factor into levels of intoxication, but gives us a stable outcome of quantity. We also chose to not include a heavy episodic drinking count or dichotomous outcome, believing that BAC was a better estimate while controlling for individual factors and minimizing alpha inflation.

Next, while our fidelity checks give us an overall picture of the types of interactions participants had during the study, we were missing quite a few tapes particularly in the ADP condition. Thus, we cannot confidently state that those interventions differed, though the consistency in the recorded sessions implies that they were different across many variables of

interest. Further, the facilitators in the active conditions failed to fully meet MI competence in some categories of behavior counts. Thus, although they differed significantly from what was provided in ADP in the expected direction of greater MI competence in BASICS and ASTP, the current study does not represent an ideal efficacy test of BASICS and ASTP but rather is more akin to an effectiveness study under near-real-world conditions. An additional limitation is that although a goal of the study was to evaluate group versus individual interventions, many of the "group" sessions had only one participant; thus we were essentially comparing an individual personalized feedback intervention with an individual multi-component skills-based intervention as our active conditions. Further, while we could generally review the types of interactions participants had during the intervention, we could not control and did not measure their reactions to other interactions in the sanctioning process, including meetings with judicial staff and referring parties like resident directors or campus police, which could have a considerable impact on putative variables like defensiveness and incident reaction. Variable sanctioning procedures also limit our generalizability to other mandated populations, given inconsistencies in alcohol policy and enforcement both within (Rubington, 1990, 1993) and between (Lenk, et al., 2012) institutions.

Future Directions

A number of future directions are identified to contribute to the literature on mandated student interventions. First, it remains a need in the literature to evaluate individual sessions and group interventions in this population, with an extensive waitlist control to account for naturalistic changes and a sample size sufficient to evaluate intervening variables. In order to

best accomplish this, a close working relationship is necessary between the judicial offices and researchers to enhance recruitment and help control for reactions to the sanctioning meetings and processes. Future studies could assess participants' reactions independently to the incident itself, the process of being sanctioned, the sanctioning meeting(s), the intervention, and any follow up requirements to differentiate the impact of perceived aversiveness from later collaboration and utility. An objective assessment of the internal and external responsibility factors, when possible, would also add value to studies. In other words, is an individual who is blaming others "in denial" or accurately assessing the situation? Narrative descriptions of the incident from both the student and the referring party would yield detailed information and offer an additional means of addressing responsibility and aversiveness. Increasing supervision could enhance facilitator competence in motivational interviewing (Mastroleo, et al., 2012). Additional studies could also seek to replicate findings in alternative settings extending current research with incarcerated young adults (L. A. Stein et al., 2011), military populations (Pemberton et al., 2011), and with other substances such as marijuana (C. M. Lee, Neighbors, Kilmer, & Larimer, 2010) to mandated groups in each unique setting.

Summary

This study evaluated a randomized control trial of alcohol interventions for mandated students. Findings suggested an iatrogenic effect following an education-only presentation by campus police, with decreases in drinking behaviors after a motivational intervention. A small sample size and differential follow up based on sex and drinking level, particularly in the ADP condition, complicates interpretation of group effects. Defensiveness was related to student

characteristics (age, sex, and Greek affiliation) pre-intervention, drinking outcomes at two month follow up, and impacted by motivational interviewing techniques. Perceptions of the incident were particularly related to outcomes, such that those who blamed others less and those who found the sanctioning incident more aversive decreased their drinking at a greater rate. These findings 1) support the continued use of brief motivational interventions with mandated students, 2) highlight the importance of evaluating and decreasing defensiveness in the mandated student population, 3) recognize the importance of perceptions about the incident on behavior change, and 4) emphasize the utility and impact of advanced MI techniques on attitude and behavior changes in this high-risk population.

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Table 1
*Demographic Characteristics of Participants (*N = *61)*

	n	%
Birth sex		
Female	26	42.6%
Male	35	57.4%
Gender identity		
Female	26	42.6%
Male	35	57.4%
Sexual orientation		
Straight/Heterosexual	60	98.4%
System missing	1	1.6%
Ethnic identity		
Non-Hispanic/Non-Latino	61	100%
Racial background		
Black/African American	2	3.3%
White/Caucasian	59	96.7%
Class Standing		
Freshman	36	59.0%
Sophomore	17	27.9%
Junior	4	6.6%
Senior	3	4.9%
Graduate	1	1.6%
Student Status		
Full time	61	100%
Housing		
Fraternity or sorority house	4	6.6%
Off-campus apartment/house	8	13.1%
Residence hall / dorm room	48	78.7%
With parents	1	1.6%
Substance free housing		
Yes	48	78.7%
No	13	21.3%
Relationship status		
Single, not dating	23	37.7%
Single, dating	20	32.8%
In a serious relationship	18	29.5%
Greek affiliation		
Non-Greek	27	44.3%
Greek	34	55.7%

Table 2
Prior Alcohol Program Attendance

	n	%
Prior alcohol program		
Yes	26	42.6%
No	35	57.4%
Program name		
DARE	18	69.2%
Inpatient treatment	1	3.8%
M.A.D.D.	1	3.8%
Scared Straight	1	3.8%
School or community program	4	15.4%
Don't remember	1	3.8%
Attendance date		
Past year	2	7.7%
Past two years	2	7.7%
More than two years ago	22	84.6%
Number of sessions		
1	7	26.9%
2	3	11.5%
3+	16	26.2%
Hours attended		
1-2 hours	10	38.5%
3-5 hours	7	26.9%
6+ hours	9	34.6%
Attendance reason		
Voluntary	4	15.4%
Required	21	80.8%
Unsure	1	3.8%
Program satisfaction		
Very dissatisfied	1	3.8%
Somewhat dissatisfied	0	0.0%
Neutral	15	57.7%
Somewhat satisfied	7	26.9%
Very satisfied	3	11.5%

Note. N = 61.

Table 3

Measure Subscales

	Satisfaction
Program Satisfaction	The information presented was interesting and helpful.
	I learned new facts about alcohol.
	The program was thorough and complete.
Facilitator Satisfaction	The facilitator(s) seemed well-organized.
	The facilitator(s) seemed competent and well-trained.
	The facilitator(s) seemed warm and understanding.
	The facilitator(s) seemed well informed about what goes on in the University setting.
Intent to Change	The information I received caused me to think differently about alcohol.
	The information I received caused me to change my pattern of alcohol use.
	I left the program with a specific goal in mind about changing my drinking habits.
	Incident Reaction
Internal Responsibility	To what extent do you believe your alcohol consumption was responsible for this incident?
	To what extent was the incident your own fault?
	To what extent do you believe your own risk taking behavior was responsible for this incident?
External Responsibility	To what extent do you believe someone else's alcohol consumption was responsible for this incident?
	To what extent was the incident someone else's fault?
Aversiveness	To what extent has this incident upset you?
	How badly do you feel about this incident?
	How much physical pain or harm has this incident caused?
	How unpleasant has this incident been for you?

Table 4

Means and Standard Deviations for Motivational Interviewing Competence Scores by Intervention

	Cutoff Scores		ADP			ASTP			BASICS		
	Proficient	Competent	*n*	*M*	*SD*	*n*	*M*	*SD*	*n*	*M*	*SD*
Global Spirit Ratings	3.50	4.00	7	2.71	1.13	12	**3.53**	0.63	16	***4.19***	0.42
Percent Open Questions	0.50	0.70	7	0.32	0.25	13	**0.52**	0.16	16	**0.60**	0.15
Percent Complex Reflections	0.40	0.50	7	0.13	0.11	13	0.18	0.12	16	0.32	0.18
Reflection to Question Ratio	1.00	2.00	7	0.30	0.19	13	0.63	0.32	16	0.67	0.27
Percent MI-adherent	0.90	1.00	7	0.14	0.38	7	**0.90**	0.19	9	**0.94**	0.14

Note. Scores in **bold** meet beginning proficiency levels, and scores in ***bold italic*** meet full competency levels. Cutoff scores and coding completed with the Motivational Interviewing Treatment Integrity (MITI) 3.0 Scale.

Table 5

Means and Standard Deviations for Motivational Interviewing Competence Scores in BASICS Interventions by Facilitator

	Cutoff Scores		Facilitator 1			Facilitator 2			Facilitator 3		
	Proficient	Competent	*n*	*M*	*SD*	*n*	*M*	*SD*	*n*	*M*	*SD*
Global Spirit Ratings	3.50	4.00	5	***4.20***	0.18	9	***4.19***	0.50	2	***4.17***	0.71
Percent Open Questions	0.50	0.70	5	***0.74***	0.05	9	**0.54**	0.15	2	**0.53**	0.08
Percent Complex Reflections	0.40	0.50	5	0.18	0.16	9	0.37	0.11	2	***0.50***	0.34
Reflection to Question Ratio	1.00	2.00	5	0.44	0.03	9	0.82	0.26	2	0.58	0.20
Percent MI-adherent	0.90	1.00	0	.	.	8	**0.98**	0.05	1	.060	.

Note. Scores in **bold** meet beginning proficiency levels, and scores in ***bold italic*** meet full competency levels. Cutoff scores and coding completed with the Motivational Interviewing Treatment Integrity (MITI) 3.0 Scale.

Table 6

Means and Standard Deviations for Motivational Interviewing Competence Scores in ASTP Interventions by Facilitator

	Cutoff Scores		Facilitator 1			Facilitator 2			Facilitator 3			Multiple facilitators		
	Proficient	Competent	*n*	*M*	*SD*	*n*	*M*	*SD*	*n*	*M*	*SD*	*n*	*M*	*SD*
Global Spirit Ratings	3.50	4.00	3	3.33	0.67	3	**3.56**	0.51	2	2.83	0.71	4	***4.00***	0.38
Percent Open Questions	0.50	0.70	3	**0.68**	0.10	3	0.49	0.22	2	0.37	0.04	5	**0.51**	0.11
Percent Complex Reflections	0.40	0.50	3	0.29	0.16	3	0.10	0.09	2	0.18	0.14	5	0.16	0.09
Reflection to Question Ratio	1.00	2.00	3	0.88	0.53	3	0.45	0.03	2	0.55	0.11	5	0.61	0.31
Percent MI-adherent	0.90	1.00	2	***1.00***	0.00	1	***1.00***	.	2	0.65	0.21	2	***1.00***	0.00

Note. Scores in **bold** meet beginning proficiency levels, and scores in ***bold italic*** meet full competency levels. Cutoff scores and coding completed with the Motivational Interviewing Treatment Integrity (MITI) 3.0 Scale.

Table 7

Means, Standard Deviations, and Intercorrelations for Intervention Features

	Descriptives			Correlations											
	n	*M*	*SD*	1	2	3	4	5	6	7	8	9	10	11	12
1. Scheduling delay	56	71.11	60.67	-											
2. Intervention length	45	56.15	16.22	-0.06	-										
MITI Behavior Counts															
3. Closed questions	45	23.82	13.29	0.28	**0.49**	-									
4. Open questions	45	24.78	9.86	-0.19	**0.37**	0.06	-								
5. Simple reflections	45	21.31	10.06	**0.39**	**0.55**	**0.53**	**0.53**	-							
6. Complex reflections	45	7.00	8.83	**0.33**	-0.09	0.20	**0.31**	**0.53**	-						
7. Giving information	45	43.87	30.12	**0.38**	**0.50**	**0.66**	-0.13	**0.32**	-0.12	-					
MITI Global Ratings															
8. Evocation	43	3.67	1.02	**-0.31**	0.23	-0.07	**0.58**	0.21	0.09	**-0.44**	-				
9. Collaboration	43	3.72	0.91	-0.03	0.09	-0.11	**0.54**	0.30	0.28	-0.26	**0.72**	-			
10. Autonomy	43	3.77	0.84	0.00	0.12	0.06	**0.48**	**0.39**	0.28	-0.22	**0.61**	**0.69**	-		
11. Direction	43	4.37	0.82	**-0.30**	0.15	-0.18	-0.01	**-0.34**	**-0.32**	-0.16	**0.35**	**0.30**	0.13	-	
12. Empathy	43	3.70	0.86	-0.02	0.02	-0.22	**0.46**	0.15	0.15	**-0.34**	**0.70**	**0.77**	**0.69**	**0.37**	-

Note. Correlations in **bold** are significant, $p < .05$. MITI = Motivational Interviewing Treatment Integrity 3.0 Scale.

Table 8

Means, Standard Deviations, and Analysis of Variance (ANOVA) Results for Intervention Features as a Function of Treatment Condition

	Intervention Type									Planned contrasts			
	ADP (*n* = 7)		ASTP (*n* = 13)		BASICS (*n* = 16)					ADP vs. ASTP/BASICS		ASTP vs. BASICS	
	M	*SD*	*M*	*SD*	*M*	*SD*	*df*	*F*	η^2	*t*	*d*	*t*	*d*
Scheduling delay	79.13	91.42	71.91	45.39	63.00	43.12	2,53	0.30	0.01	-0.64	-0.18	-0.46	-0.13
Intervention length	46.91	10.13	62.89	13.67	45.12	8.72	2,32	10.24***	0.38	1.53	0.53	-4.33***	-1.51
MITI Behavior Counts													
Closed questions	22.00	10.77	24.85	14.85	19.75	11.60	2,33	0.57	0.03	0.06	0.02	-1.07	-0.37
Open questions	14.29	12.65	24.15	6.71	27.25	8.85	2,33	5.09*	0.24	2.29†	1.71	1.07	0.41
Simple reflections	10.57	6.37	23.00	7.66	21.13	12.13	2,33	3.96*	0.19	3.78**	2.02	-0.51	-0.20
Complex reflections	2.14	3.08	5.54	5.33	13.00	11.68	2,33	4.84*	0.23	3.55**	1.40	2.28*	0.97
Giving information	33.00	4.76	61.92	34.81	23.25	7.83	2,33	11.69***	0.41	1.83†	0.91	-3.93**	-2.18
MITI Global Ratings													
Evocation	2.71	1.11	3.33	0.98	4.13	0.50	2,32	7.86**	0.33	2.26†	1.63	2.55*	1.31
Collaboration	2.71	1.38	3.50	0.67	4.25	0.58	2,32	9.05***	0.36	2.17†	1.68	3.10**	1.33
Autonomy	2.71	1.11	3.75	0.62	4.19	0.66	2,32	9.34***	0.37	3.94***	1.39	1.52	0.54
Direction	4.43	0.79	4.25	0.75	4.38	0.96	2,32	0.12	0.01	-0.32	-0.11	0.38	0.13
Empathy	3.14	1.46	3.58	0.79	4.00	0.63	2,32	2.34	0.13	1.14	0.87	1.50	0.66

Note. † $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$. MITI = Motivational Interviewing Treatment Integrity 3.0 Scale.

Table 9

*Prevalence of Survey Follow Up in Male (*n *= 35) and Female (*n *= 26) Participants*

	Overall		Female		Male	
	n	%	*n*	%	*n*	%
No follow ups	13	21.3%	1	3.8%	12	34.3%
Some follow ups	13	21.3%	7	26.9%	6	17.1%
All follow ups	35	57.4%	18	69.2%	17	48.6%
Total	61		26		35	

Note. $N = 61$. χ^2 (2, $N = 61$) = 8.27, $p < .05$.

Table 10

Means, Standard Deviations, and Analysis of Variance (ANOVA) Results for Drinking Behaviors and Attitudes as a Function of Completion Status

	Follow ups completed									Planned contrasts			
	None (*n* = 13)		Some (*n* = 13)		All (*n* = 35)					None vs. Any		Some vs. All	
	M	*SD*	*M*	*SD*	*M*	*SD*	*df*	*F*	η^2	*t*	*d*	*t*	*d*
BAC	0.10	0.07	0.09	0.07	0.07	0.07	2,58	0.72	0.02	-0.78	-0.21	-0.70	-0.18
Weekly drinks	15.46	11.75	13.08	12.14	8.80	7.65	2,58	2.19	0.07	-1.32	-0.35	-1.28	-0.34
Consequences	5.17	5.89	8.23	9.05	5.57	5.88	2,57	0.55	0.02	0.40	0.10	-1.03	-0.27
Defensiveness	4.42	1.09	3.83	0.89	3.79	1.01	2,58	1.96	0.06	-1.89†	-0.50	-0.12	-0.03
Readiness to change	2.74	0.67	2.99	0.82	2.77	0.78	2,58	0.46	0.02	0.56	0.15	-0.89	-0.23
Internal responsibility	3.13	1.68	3.00	1.70	3.14	1.61	2,58	0.04	0.00	-0.11	-0.03	0.27	0.07
External responsibility	4.27	1.74	3.77	2.06	4.06	2.21	2,58	0.19	0.01	-0.53	-0.14	0.42	0.11
Aversiveness	2.73	1.43	3.92	1.79	3.97	1.68	2,58	2.83†	0.09	2.29*	0.60	0.09	0.02

Note. † $p < .10$; * $p < .05$. BAC = Peak Weekend Blood Alcohol Concentration. BAC, weekly drinks, and consequences were square root transformed prior to analyses. Untransformed means and standard deviations are presented above.

Table 11

Differences in Drinking Behaviors and Attitudes as a Function of Any Follow Up Completion by Treatment Condition

	ADP					
	No follow up (n = 5)		Any follow up (n = 13)			
	M	*SD*	*M*	*SD*	*t*	*d*
BAC	0.11	0.08	0.06	0.07	1.70	0.85
Weekly drinks	22.00	14.23	10.23	12.41	1.91†	0.95
Consequences	4.50	3.11	4.85	4.45	0.19	0.10
Defensiveness	4.44	1.15	3.69	1.10	1.28	0.64
Readiness to change	2.57	0.48	2.83	0.75	-0.87	-0.51
Internal responsibility	2.93	1.19	3.26	1.80	-0.37	-0.18
External responsibility	4.50	1.66	3.81	2.28	0.61	0.31
Aversiveness	2.20	0.21	4.27	1.51	-4.84***	-2.67
	ASTP					
	No follow up (n = 5)		Any follow up (n = 13)			
	M	*SD*	*M*	*SD*	*t*	*d*
BAC	0.10	0.10	0.08	0.07	0.07	0.03
Weekly drinks	9.67	10.02	9.41	8.96	-0.24	-0.10
Consequences	2.67	0.58	7.55	8.62	-0.55	-0.23
Defensiveness	4.50	0.90	3.78	0.97	1.21	0.51
Readiness to change	3.08	0.44	3.02	0.82	0.14	0.06
Internal responsibility	2.33	0.88	2.92	1.74	-0.57	-0.24
External responsibility	4.67	1.53	4.05	2.14	0.48	0.20
Aversiveness	2.92	0.95	4.02	1.95	-0.95	-0.40
	BASICS					
	No follow up (n = 5)		Any follow up (n = 13)			
	M	*SD*	*M*	*SD*	*t*	*d*
BAC	0.08	0.06	0.09	0.05	-0.18	-0.09
Weekly drinks	12.40	8.44	10.62	5.68	0.49	0.24
Consequences	7.20	8.81	5.62	5.47	0.21	0.10
Defensiveness	4.36	1.36	3.95	0.90	0.76	0.38
Readiness to change	2.72	0.95	2.53	0.74	0.45	0.23
Internal responsibility	3.80	2.36	3.26	1.26	0.64	0.32
External responsibility	3.80	2.17	4.04	2.20	-0.21	-0.10
Aversiveness	3.15	2.24	3.54	1.39	-0.45	-0.22

Note. † $p < .10$; * $p < .05$. BAC = Peak weekend blood alcohol concentration. BAC, weekly drinks, and consequences were square root transformed prior to analyses. Untransformed means and standard deviations are presented above.

Table 12

Differences in Drinking Behaviors and Attitudes as a Function of Two Month Follow Up Completion by Treatment Condition

	ADP					
	Not completed (*n* = 7)		Completed (*n* = 11)			
	M	*SD*	*M*	*SD*	*t*	*d*
BAC	0.10	0.07	0.06	0.07	1.56	0.78
Weekly drinks	18.29	13.35	10.45	13.52	1.59	0.79
Consequences	3.17	3.19	5.64	4.39	-1.14	-0.59
Defensiveness	4.37	0.97	3.60	1.16	1.46	0.73
Readiness to change	2.43	0.48	2.96	0.74	-1.86†	-0.93
Internal responsibility	2.57	1.21	3.55	1.78	-1.26	-0.63
External responsibility	4.79	1.68	3.50	2.26	1.29	0.65
Aversiveness	2.57	1.09	4.41	1.46	-2.85*	-1.43
	ASTP					
	Not completed (*n* = 7)		Completed (*n* = 18)			
	M	*SD*	*M*	*SD*	*t*	*d*
BAC	0.09	0.08	0.08	0.07	0.00	0.00
Weekly drinks	12.29	11.32	8.33	7.81	0.78	0.33
Consequences	8.86	11.80	6.22	6.66	0.77	0.32
Defensiveness	4.11	1.00	3.77	0.97	0.78	0.33
Readiness to change	3.11	0.59	2.99	0.85	0.33	0.14
Internal responsibility	3.19	1.79	2.72	1.64	0.63	0.26
External responsibility	4.21	1.68	4.08	2.23	0.14	0.06
Aversiveness	3.82	2.08	3.92	1.86	-0.11	-0.05
	BASICS					
	Not completed (*n* = 5)		Completed (*n* = 13)			
	M	*SD*	*M*	*SD*	*t*	*d*
BAC	0.08	0.06	0.09	0.05	-0.18	-0.09
Weekly drinks	12.40	8.44	10.62	5.68	0.49	0.24
Consequences	7.20	8.82	5.62	5.47	0.21	0.11
Defensiveness	4.36	1.36	3.95	0.90	0.76	0.38
Readiness to change	2.72	0.95	2.53	0.74	0.46	0.23
Internal responsibility	3.80	2.36	3.26	1.26	0.64	0.32
External responsibility	3.80	2.17	4.04	2.20	-0.21	-0.10
Aversiveness	3.15	2.24	3.54	1.39	-0.45	-0.22

Note. † $p < .10$; * $p < .05$. BAC = Peak weekend blood alcohol concentration. BAC, weekly drinks, and consequences were square root transformed prior to analyses. Untransformed means and standard deviations are presented above.

Table 13

Differences in Drinking Behaviors and Attitudes as a Function of Four Month Follow Up Completion by Treatment Condition

	ADP					
	Not completed (*n* = 6)		Completed (*n* = 12)			
	M	*SD*	*M*	*SD*	*t*	*d*
BAC	0.13	0.09	0.04	0.04	2.99**	1.49
Weekly drinks	25.50	15.35	7.50	7.89	3.20**	1.60
Consequences	6.00	4.30	4.25	4.07	0.94	0.48
Defensiveness	4.47	1.03	3.62	1.11	1.57	0.78
Readiness to change	2.75	0.62	2.76	0.74	-0.02	-0.01
Internal responsibility	3.17	1.21	3.17	1.85	0.00	0.00
External responsibility	4.08	1.80	3.96	2.31	0.12	0.06
Aversiveness	2.13	0.26	4.48	1.36	-5.79***	-3.27
	ASTP					
	Not completed (*n* = 8)		Completed (*n* = 17)			
	M	*SD*	*M*	*SD*		
BAC	0.09	0.07	0.08	0.08	0.04	0.02
Weekly drinks	10.75	11.32	8.82	7.78	0.00	0.00
Consequences	5.75	5.34	7.53	9.38	-0.02	-0.01
Defensiveness	4.00	0.81	3.81	1.06	0.46	0.19
Readiness to change	3.07	0.77	3.00	0.80	0.21	0.09
Internal responsibility	3.17	1.93	2.71	1.56	0.64	0.27
External responsibility	4.06	2.04	4.15	2.13	-0.09	-0.04
Aversiveness	3.97	1.83	3.85	1.96	0.14	0.06
	BASICS					
	Not completed (*n* = 6)		Completed (*n* = 12)			
	M	*SD*	*M*	*SD*		
BAC	0.90	0.06	0.08	0.06	0.24	0.12
Weekly drinks	12.33	7.55	10.50	5.92	0.60	0.30
Consequences	6.67	7.99	5.75	5.69	0.19	0.09
Defensiveness	4.07	1.41	4.06	0.84	0.02	0.01
Readiness to change	2.81	0.88	2.47	0.74	0.87	0.43
Internal responsibility	3.78	2.12	3.22	1.31	0.69	0.35
External responsibility	3.33	2.25	4.29	2.09	-0.89	-0.45
Aversiveness	3.58	2.27	3.35	1.27	0.28	0.14

Note. † $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$. BAC = Peak weekend blood alcohol concentration. BAC, weekly drinks, and consequences were square root transformed prior to analyses. Untransformed means and standard deviations are presented above.

Table 14

Differences in Drinking Behaviors and Attitudes as a Function of Six Month Follow Up Completion by Treatment Condition

	ADP					
	Not completed (*n* = 7)		Completed (*n* = 11)			
	M	*SD*	*M*	*SD*	*t*	*d*
BAC	0.12	0.09	0.04	0.04	2.63*	1.31
Weekly drinks	24.29	14.37	6.64	7.66	3.54**	1.77
Consequences	6.83	4.36	3.64	3.64	1.63	0.84
Defensiveness	4.14	1.27	3.75	1.07	0.72	0.36
Readiness to change	2.89	0.68	2.67	0.71	0.67	0.34
Internal responsibility	3.10	1.12	3.21	1.93	-0.14	-0.07
External responsibility	3.79	1.82	4.14	2.34	-0.34	-0.17
Aversiveness	2.46	0.93	4.48	1.43	-3.30**	-1.65
	ASTP					
	Not completed (*n* = 7)		Completed (*n* = 18)			
	M	*SD*	*M*	*SD*	*t*	*d*
BAC	0.08	0.08	0.09	0.07	-0.70	-0.49
Weekly drinks	7.14	6.89	10.33	9.55	-1.04	-0.44
Consequences	8.43	11.43	6.39	6.94	0.49	0.20
Defensiveness	4.44	0.68	3.64	0.99	1.95†	0.81
Readiness to change	3.17	0.83	2.97	0.77	0.57	0.24
Internal responsibility	2.67	1.33	2.93	1.80	-0.34	-0.14
External responsibility	4.93	1.37	3.81	2.22	1.53	0.72
Aversiveness	3.32	0.93	4.11	2.13	-1.29	-0.54
	BASICS					
	Not completed (*n* = 6)		Completed (*n* = 12)			
	M	*SD*	*M*	*SD*	*t*	*d*
BAC	0.09	0.06	0.08	0.06	0.24	0.12
Weekly drinks	12.33	7.55	10.50	5.92	0.60	0.30
Consequences	6.67	7.99	5.75	5.69	0.19	0.09
Defensiveness	4.07	1.41	4.06	0.84	0.02	0.01
Readiness to change	2.81	0.88	2.47	0.74	0.87	0.43
Internal responsibility	3.78	2.12	3.22	1.31	0.69	0.35
External responsibility	3.33	2.25	4.29	2.09	-0.89	-0.45
Aversiveness	3.58	2.27	3.35	1.27	0.28	0.14

Note. † $p < .10$; * $p < .05$; ** $p < .01$. BAC = Peak weekend blood alcohol concentration. BAC, weekly drinks, and consequences were square root transformed prior to analyses. Untransformed means and standard deviations are presented above.

Table 15

Drinking Behavior Differences Pre-Incident and Post-Incident (All Pre-Intervention)

	Pre-incident		Post-incident			
	M	*SD*	*M*	*SD*	*t*	*d*
Monthly drinks	39.09	40.77	30.50	38.70	3.89***	1.06
Monthly drinking days	7.27	4.31	5.66	4.52	4.13***	1.12
Drinks per drinking day	4.39	2.73	4.16	3.19	1.71†	0.46

Note. † $p < .10$; *** $p < .001$. Outcome variables were square root transformed prior to analyses. Untransformed means and standard deviations are presented above.

Table 16

Means, Standard Deviations, and Intercorrelations for Main Drinking Outcomes at Each Follow Up

	Descriptives			Correlations											
	n	*M*	*SD*	1	2	3	4	5	6	7	8	9	10	11	12
BAC															
1. Baseline	61	0.08	0.07	-											
2. 2 month	42	0.06	0.07	**0.77**	-										
3. 4 month	41	0.05	0.05	**0.68**	**0.78**	-									
4. 6 month	41	0.04	0.06	**0.46**	**0.60**	**0.51**	-								
Weekly drinks															
5. Baseline	61	11.13	9.92	**0.78**	**0.64**	**0.44**	0.25	-							
6. 2 month	42	8.24	9.08	**0.62**	**0.78**	**0.50**	**0.46**	**0.84**	-						
7. 4 month	41	7.56	7.35	**0.53**	**0.69**	**0.70**	**0.34**	**0.63**	**0.87**	-					
8. 6 month	41	6.29	7.55	**0.46**	**0.53**	**0.37**	**0.85**	**0.43**	**0.60**	**0.38**	-				
Consequences															
9. Baseline	60	6.07	6.66	**0.36**	**0.55**	0.14	0.30	**0.46**	**0.55**	0.25	**0.43**	-			
10. 2 month	42	4.88	5.89	**0.35**	**0.45**	0.11	0.15	**0.38**	**0.54**	**0.41**	0.20	**0.49**	-		
11. 4 month	39	4.79	6.04	0.19	**0.47**	0.29	0.19	0.15	**0.43**	**0.38**	0.18	**0.41**	**0.69**	-	
12. 6 month	41	4.12	7.52	**0.40**	**0.54**	0.18	0.19	**0.43**	**0.55**	**0.37**	0.28	**0.62**	**0.79**	**0.70**	-

Note. BAC = Peak Weekend Blood Alcohol Concentration. Correlations in **bold** are significant, $p < .05$.

Table 17

Means, Standard Deviations, and Intercorrelations for Outcomes and Moderators at Baseline

	Descriptives			Correlations										
	n	*M*	*SD*	1	2	3	4	5	6	7	8	9	10	11
1. BAC	56	0.07	0.06	-										
2. Weekly drinks	56	9.52	7.82	**.73**	-									
3. Consequences	56	5.86	6.70	**.35**	**.44**	-								
4. Policy support	56	4.27	1.84	.07	.00	-.19	-							
5. Readiness to change	56	2.76	0.76	.09	.05	**.32**	.21	-						
Incident Reactions														
6. Internal responsibility	56	3.04	1.51	.00	.22	.20	.13	**.38**	-					
7. External responsibility	56	4.15	2.00	-.18	**-.32**	-.13	-.17	**-.29**	**-.42**	-				
8. Aversiveness	56	3.69	1.66	-.04	-.05	-.06	.23	**.30**	.29	-.05	-			
Intervention Satisfaction														
9. Program satisfaction	45	3.73	0.77	-.29	**-.44**	-.13	.22	.26	-.10	.13	-.06	-		
10. Facilitator satisfaction	45	4.08	0.75	.00	-.28	-.19	.18	.11	-.20	.09	-.29	**.71**	-	
11. Intent to change	45	2.90	1.09	-.25	-.25	-.13	**.42**	**.43**	.11	.04	.25	**.52**	.25	-

Note. BAC = Peak Weekend Blood Alcohol Concentration. Correlations in **bold** are significant, $p < .05$.

Table 18

Means and Standard Deviations for Mediators at Each Follow Up

	Baseline			2 month			4 month			6 month		
	n	*M*	*SD*	*n*	*M*	*SD*	*n*	*M*	*SD*	*n*	*M*	*SD*
Mediators												
Pre-intervention defensiveness	61	3.93	1.02	12	4.33	1.03	2	3.30	0.42	2	3.50	0.28
Post-intervention defensiveness	-	-	-	28	3.59	1.41	38	3.85	1.20	37	3.87	1.15
Descriptive norms: friends	61	17.70	9.52	42	13.26	6.36	41	12.66	6.32	41	13.10	9.95
Descriptive norms: students	60	14.25	10.32	42	11.76	12.02	41	11.95	9.46	41	10.29	10.70
Injunctive norms: friends	61	2.54	1.01	42	2.51	1.01	41	2.37	0.79	41	2.32	0.76
Injunctive norms: parents	60	1.40	0.42	42	1.46	0.60	41	1.52	0.70	41	1.51	0.66
Protective behavioral strategies	59	3.26	0.80	39	3.29	0.70	39	3.29	0.75	38	3.31	0.87
Positive expectancies	61	2.67	1.43	42	2.38	1.49	41	2.39	1.41	41	2.23	1.52
Negative expectancies	61	2.79	1.54	42	2.65	1.53	41	2.89	1.80	41	2.69	1.81

Table 19

Means, Standard Deviations, and Intercorrelations for Outcomes and Mediators at Baseline

	Descriptives			Correlations											
	n	*M*	*SD*	1	2	3	4	5	6	7	8	9	10	11	12
1. BAC	61	0.08	0.07	-											
2. Weekly drinks	61	11.13	9.92	**0.78**	-										
3. Consequences	60	6.07	6.66	**0.36**	**0.46**	-									
4. Pre- defensiveness	61	3.93	1.02	0.07	0.06	0.03	-								
5. Post- defensiveness	-	-	-	-	-	-	-	-							
6. Descriptive norms: friends	61	17.70	9.52	**0.31**	**0.51**	0.24	-0.04	-	-						
7. Descriptive norms: students	60	14.25	10.32	**0.55**	**0.67**	**0.66**	0.10	-	**0.44**	-					
8. Injunctive norms: friends	61	2.54	1.01	**0.32**	**0.50**	**0.46**	**0.39**	-	0.18	**0.56**	-				
9. Injunctive norms: parents	60	1.40	0.42	-0.01	0.09	-0.10	**0.33**	-	0.07	0.13	**0.48**	-			
10. PBS	59	3.26	0.80	**-0.31**	**-0.47**	**-0.47**	**-0.34**	-	-0.22	**-0.50**	**-0.56**	-0.26	-		
11. Positive expectancies	61	2.67	1.43	0.12	0.09	**0.39**	-0.03	-	-0.03	0.19	0.10	-0.04	-0.01	-	
12. Negative expectancies	61	2.79	1.54	-0.10	-0.11	0.10	-0.16	-	-0.10	-0.03	-0.05	-0.19	0.16	0.15	-

Note. BAC = Peak weekend blood alcohol concentration. Pre-defensiveness = Pre- intervention defensiveness. Post- defensiveness = Post-intervention defensiveness. PBS = Protective behavioral strategies. Correlations in **bold** are significant, $p < .05$. Post-Intervention defensiveness was not assessed at Baseline as no interventions were yet completed.

Table 20

Means, Standard Deviations, and Intercorrelations for Outcomes and Mediators at Two Month Follow Up

	Descriptives			Correlations											
	n	*M*	*SD*	1	2	3	4	5	6	7	8	9	10	11	12
1. BAC	42	0.06	0.07	-											
2. Weekly drinks	42	8.24	9.08	**0.78**	-										
3. Consequences	42	4.88	5.89	**0.45**	**0.54**	-									
4. Pre- defensiveness	12	4.33	1.03	-0.17	0.35	0.45	-								
5. Post- defensiveness	28	3.59	1.41	**0.48**	**0.38**	**0.42**	a	-							
6. Descriptive norms: friends	42	13.26	6.36	**0.41**	**0.43**	0.07	0.15	0.30	-						
7. Descriptive norms: students	42	11.76	12.02	**0.54**	**0.74**	0.22	0.22	0.13	**0.68**	-					
8. Injunctive norms: friends	42	2.51	1.01	**0.40**	**0.55**	**0.34**	0.53	**0.52**	**0.35**	**0.56**	-				
9. Injunctive norms: parents	42	1.46	0.60	0.19	0.24	0.02	0.30	0.31	0.01	0.14	**0.57**	-			
10. PBS	39	3.29	0.70	**-0.36**	**-0.51**	-0.26	**-0.65**	**-0.47**	-0.08	**-0.35**	**-0.74**	**-0.51**	-		
11. Positive expectancies	42	2.38	1.49	0.24	0.15	0.26	-0.51	0.20	0.06	0.23	0.20	-0.05	-0.07	-	
12. Negative expectancies	42	2.65	1.53	0.11	-0.17	0.07	-0.45	0.06	-0.03	-0.02	-0.17	-0.28	0.31	**0.42**	-

Note. BAC = Peak weekend blood alcohol concentration. Pre-defensiveness = Pre- intervention defensiveness. Post- defensiveness = Post-intervention defensiveness. PBS = Protective behavioral strategies. Correlations in **bold** are significant, $p < .05$. a: A pre/post-intervention correlation is not created as participants completed only one of the measures at each time point.

Table 21

Means, Standard Deviations, and Intercorrelations for Outcomes and Mediators at Four Month Follow Up

	Descriptives			Correlations											
	n	*M*	*SD*	1	2	3	4	5	6	7	8	9	10	11	12
1. BAC	41	0.05	0.05	-											
2. Weekly drinks	41	7.56	7.35	**0.70**	-										
3. Consequences	39	4.79	6.04	0.29	**0.38**	-									
4. Pre- defensiveness	2	3.30	0.42	-	-	-	-								
5. Post- defensiveness	38	3.85	1.20	0.22	0.23	0.23	-	-							
6. Descriptive norms: friends	41	12.66	6.32	**0.43**	**0.45**	0.00	-	0.31	-						
7. Descriptive norms: students	41	11.95	9.46	**0.48**	**0.78**	0.15	-	**0.34**	**0.61**	-					
8. Injunctive norms: friends	41	2.37	0.79	**0.39**	**0.47**	**0.37**	-	0.18	0.03	0.22	-				
9. Injunctive norms: parents	41	1.52	0.70	0.12	0.02	0.20	-	0.13	-0.14	-0.18	**0.66**	-			
10. PBS	39	3.29	0.75	-0.17	-0.04	-0.16	-	**-0.49**	0.11	0.00	**-0.41**	**-0.55**	-		
11. Positive expectancies	41	2.39	1.41	0.20	0.12	0.01	-	0.12	0.05	0.13	-0.04	-0.27	-0.07	-	
12. Negative expectancies	41	2.89	1.80	0.04	-0.03	-0.27	-	-0.28	0.03	-0.04	**-0.31**	**-0.35**	**0.37**	0.17	-

Note. BAC = Peak weekend blood alcohol concentration. Pre-defensiveness = Pre- intervention defensiveness. Post- defensiveness = Post-intervention defensiveness. PBS = Protective behavioral strategies. Correlations in **bold** are significant, $p < .05$. Pre-intervention defensiveness is not reported due to too low of a sample size for meaningful results.

Table 22

Means, Standard Deviations, and Intercorrelations for Outcomes and Mediators at Six Month Follow Up

	Descriptives			Correlations											
	n	*M*	*SD*	1	2	3	4	5	6	7	8	9	10	11	12
1. BAC	41	0.04	0.06	-											
2. Weekly drinks	41	6.29	7.55	**0.85**											
3. Consequences	41	4.12	7.52	0.19	0.28										
4. Pre- defensiveness	2	3.50	0.28	-	-	-	-								
5. Post- defensiveness	37	3.87	1.15	0.10	0.10	**0.43**	-								
6. Descriptive norms: friends	41	13.10	9.95	**0.55**	**0.51**	**0.40**	-	0.04							
7. Descriptive norms: students	41	10.29	10.70	**0.48**	**0.53**	0.28	-	-0.01	**0.63**						
8. Injunctive norms: friends	41	2.32	0.76	0.03	0.21	**0.44**	-	**0.41**	0.26	**0.37**					
9. Injunctive norms: parents	41	1.51	0.66	-0.01	0.16	-0.05	-	0.24	-0.05	0.20	**0.52**				
10. PBS	38	3.31	0.87	-0.15	-0.23	-0.03	-	**-0.55**	0.06	-0.14	**-0.33**	**-0.54**			
11. Positive expectancies	41	2.23	1.52	0.14	0.21	0.28	-	0.16	0.25	0.14	**0.43**	0.08	-0.05		
12. Negative expectancies	41	2.69	1.81	**0.36**	0.23	0.11	-	0.09	0.26	0.14	0.27	-0.05	0.05	**0.46**	-

Note. BAC = Peak weekend blood alcohol concentration. Pre-defensiveness = Pre- intervention defensiveness. Post- defensiveness = Post-intervention defensiveness. PBS = Protective behavioral strategies. Correlations in **bold** are significant, $p < .05$. . Pre-intervention defensiveness is not reported due to too low of a sample size for meaningful results.

Table 23

Drinking Behavior Differences between Female and Male Participants and between Non-Greek and Greek Affiliated Participants at Each Follow Up

	Sex								Greek Affiliation							
	Female			Male					Non-Greek			Greek				
	n	*M*	*SD*	*n*	*M*	*SD*	*t*	*d*	*n*	*M*	*SD*	*n*	*M*	*SD*	*t*	*d*
Baseline																
BAC	26	0.08	0.06	35	0.08	0.07	0.83	0.22	27	0.07	0.07	34	0.09	0.07	-1.21	-0.32
Weekly drinks	26	7.50	4.70	35	13.83	11.82	-1.91†	-0.52	27	10.96	9.52	34	11.26	10.36	-0.39	-0.10
Consequences	26	5.27	5.48	34	6.68	7.46	-0.60	-0.16	27	6.96	7.97	33	5.33	5.38	0.66	0.17
2 month																
BAC	23	0.07	0.06	19	0.05	0.07	1.44	0.45	15	0.05	0.08	27	0.06	0.06	-1.54	-0.49
Weekly drinks	23	6.57	5.53	19	10.26	11.94	-0.77	-0.28	15	7.93	10.05	27	8.41	8.70	-0.80	-0.25
Consequences	23	5.52	5.76	19	4.11	6.10	1.08	0.34	15	5.07	6.52	27	4.78	5.63	0.12	0.04
4 month																
BAC	21	0.06	0.05	20	0.05	0.05	0.87	0.28	14	0.05	0.06	27	0.06	0.05	-1.04	-0.33
Weekly drinks	21	6.00	4.62	20	9.20	9.26	-0.98	-0.31	14	8.64	9.95	27	7.00	5.71	0.10	0.03
Consequences	20	5.65	6.17	19	3.89	5.94	1.33	0.44	14	5.29	6.60	25	4.52	5.83	0.18	0.06
6 month																
BAC	21	0.06	0.08	20	0.06	0.08	1.25	0.41	16	0.04	0.08	25	0.05	0.06	-0.66	-0.21
Weekly drinks	21	6.95	8.67	20	5.60	6.32	0.39	0.12	16	6.81	9.47	25	5.96	6.22	-0.24	-0.08
Consequences	21	4.29	7.07	20	3.95	8.14	0.72	0.23	16	5.13	8.91	25	3.48	6.60	0.52	0.17

Note. † $p < .10$. BAC = Peak weekend blood alcohol concentration. BAC, Weekly drinks, and consequences were square root transformed prior to analyses. Untransformed means and standard deviations are presented above.

Table 24

Moderator Differences between Female and Male Participants and between Non-Greek and Greek Affiliated Participants at Baseline

	Sex								Greek Affiliation							
	Female			Male					Non-Greek			Greek				
	n	*M*	*SD*	*n*	*M*	*SD*	*t*	*d*	*n*	*M*	*SD*	*n*	*M*	*SD*	*t*	*d*
Policy support	26	4.31	1.93	35	4.34	1.81	-0.07	-0.02	27	4.37	2.04	34	4.29	1.71	0.16	0.04
Readiness	26	2.67	0.79	35	2.92	0.74	-1.27	-0.33	27	3.03	0.78	34	2.64	0.71	2.01*	0.52
Incident reaction																
Internal	26	2.44	1.13	35	3.61	1.75	-3.17**	-0.83	27	3.59	1.70	34	2.73	1.46	2.14*	0.56
External	26	4.58	2.09	35	3.64	1.97	1.78†	0.46	27	3.43	1.73	34	4.53	2.19	-2.14*	-0.56
Aversiveness	26	3.75	1.74	35	3.66	1.70	0.21	0.05	27	3.75	1.74	34	3.65	1.70	0.22	0.06
Satisfaction																
Program	25	3.79	0.62	20	3.65	0.94	0.58	0.18	16	3.71	0.77	29	3.74	0.79	-0.11	-0.03
Facilitator	25	4.27	0.48	20	3.84	0.94	2.00†	0.61	16	4.00	0.74	29	4.12	0.76	-0.52	-0.16
Intent	25	2.72	1.05	20	3.13	1.12	-1.27	-0.39	16	3.00	1.14	29	2.85	1.07	0.44	0.13

Note. † $p < .10$; * $p < .05$; ** $p < .01$. Readiness = Readiness to change. Intent = Intent to change.

Table 25

Hierarchical Linear Modeling: Unconditional Models for Drinking Outcome Variables

	τ	Intercept			Linear change		
	Correlation: Intercept and time	*b*	*SE*	Variance Component of *b*	*b*	*SE*	Variance Component of *b*
BAC	-.53***	0.07***	0.01	0.01***	-0.01**	0.00	0.00***
Weekly drinks	-.55***	9.43***	1.05	48.62***	-0.93*	0.36	2.25*
Consequences	-.05	5.73***	0.79	23.29***	-0.49	0.33	1.77**

Note. $N = 56$. * $p < .05$; ** $p < .01$; *** $p < .001$. BAC = Peak weekend blood alcohol concentration.

Table 26

Hierarchical Linear Modeling: Conditional Models for Drinking Outcome Variables by Treatment Condition

	BAC		Weekly Drinks		Consequences	
	b	*SE*	*b*	*SE*	*b*	*SE*
Intercept						
Intercept	0.07***	0.01	9.64***	1.07	5.69***	0.75
ADP vs. ASTP/BASICS	0.02	0.01	-0.62	1.74	0.58	0.93
ASTP vs. BASICS	0.01	0.01	2.28*	1.08	-0.05	1.02
Time						
Intercept	-0.01**	0.00	-0.95*	0.36	-0.42	0.32
ADP vs. ASTP/BASICS	-0.00	0.00	0.20	0.48	0.21	0.41
ASTP vs. BASICS	-0.00	0.00	-0.17	0.47	0.72	0.43
Variance Components						
Intercept	0.00***		46.89***		24.72***	
Time slope	0.00***		2.49*		1.65**	

Note. $N = 56$. * $p < .05$; ** $p < .01$; *** $p < .001$. ADP = Alcohol Diversion Program. ASTP = Alcohol Skills Training Program. BASICS = Brief Alcohol Screening and Intervention for College Students.

Table 27

Hierarchical Linear Modeling: Conditional Models for Drinking Outcome Variables by Treatment Condition and Advanced Motivational Interviewing Techniques

	BAC		Weekly Drinks		Consequences	
	b	*SE*	*b*	*SE*	*b*	*SE*
Intercept						
Intercept	0.06***	0.01	9.09	1.23	5.14***	0.83
ADP vs. ASTP/BASICS	0.03*	0.01	-0.08	2.08	0.45	1.28
ASTP vs. BASICS	0.02	0.01	2.30†	1.18	1.02	1.00
Open Questions	-0.00	0.00	0.00	0.11	0.11	0.08
Complex Reflections	-0.00	0.00	0.03	0.14	-0.06	0.09
Time						
Intercept	-0.01	0.00	-0.49	0.43	-0.34	0.36
ADP vs. ASTP/BASICS	-0.01*	0.00	-0.84	0.58	0.62	0.57
ASTP vs. BASICS	-0.01	0.00	-0.53	0.46	0.77†	0.43
Open Questions	0.00	0.00	0.00	0.04	-0.03	0.04
Complex Reflections	0.00	0.00	0.08	0.05	-0.04	0.04
Variance Components						
Intercept	0.00***		35.77***		20.24***	
Time slope	0.00**		2.31†		1.19*	

Note. $N = 56$. † $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$. ADP = Alcohol Diversion Program. ASTP = Alcohol Skills Training Program. BASICS = Brief Alcohol Screening and Intervention for College Students.

Table 28

Hierarchical Linear Modeling: Conditional Models for Drinking Outcome Variables by Treatment Condition and Policy Support

	BAC		Weekly Drinks		Consequences	
	b	*SE*	*b*	*SE*	*b*	*SE*
Intercept						
Intercept	0.07***	0.01	9.64***	1.07	5.73***	0.75
ADP vs. ASTP/BASICS	0.02†	0.01	-0.64	1.77	0.44	0.89
ASTP vs. BASICS	0.01	0.01	2.27	1.06	-0.15	1.03
Policy support	0.00	0.00	-0.06	0.57	-0.65	0.56
Time						
Intercept	-0.01**	0.00	-0.95**	0.36	-0.46	0.31
ADP vs. ASTP/BASICS	-0.00	0.00	0.20	0.48	0.27	0.39
ASTP vs. BASICS	-0.00	0.00	-0.16	0.47	0.81†	0.43
Policy support	-0.00	0.00	0.03	0.16	0.44*	0.22
Variance Components						
Intercept	0.00***		48.06***		24.75***	
Time slope	0.00**		2.64*		1.47**	

Note. $N = 56$. † $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$. ADP = Alcohol Diversion Program. ASTP = Alcohol Skills Training Program. BASICS = Brief Alcohol Screening and Intervention for College Students.

Table 29

Hierarchical Linear Modeling: Conditional Models for Drinking Outcome Variables by Treatment Condition and Readiness to Change

	BAC		Weekly Drinks		Consequences	
	b	*SE*	*b*	*SE*	*b*	*SE*
Intercept						
Intercept	0.07***	0.01	9.64***	1.07	5.73***	0.74
ADP vs. ASTP/BASICS	0.02†	0.01	-0.63	1.75	0.53	0.90
ASTP vs. BASICS	0.01	0.01	2.34	1.02	0.38	0.92
Readiness	0.00	0.01	-0.06	0.57	2.33*	1.07
Time						
Intercept	-0.01**	0.00	-0.94*	0.37	-0.44	0.33
ADP vs. ASTP/BASICS	-0.00	0.00	0.21	0.48	0.22	0.42
ASTP vs. BASICS	-0.00	0.00	-0.14	0.53	0.61	0.37
Readiness	-0.00	0.00	0.14	0.53	-0.57	0.45
Variance Components						
Intercept	0.00***		47.95***		22.29***	
Time slope	0.00**		2.62*		1.65**	

Note. $N = 56$. † $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$. ADP = Alcohol Diversion Program. ASTP = Alcohol Skills Training Program. BASICS = Brief Alcohol Screening and Intervention for College Students.

Table 30

Hierarchical Linear Modeling: Conditional Models for Drinking Outcome Variables by Treatment Condition and Intervention Satisfaction

	BAC		Weekly Drinks		Consequences	
	b	*SE*	*b*	*SE*	*b*	*SE*
Intercept						
Intercept	0.07***	0.01	8.72***	0.98	5.61***	0.74
ADP vs. ASTP/BASICS	0.02	0.01	1.17	1.55	0.89	1.07
ASTP vs. BASICS	0.00	0.01	1.38	1.18	-0.80	1.04
Program	-0.03†	0.02	-2.95	2.44	1.01	1.89
Facilitator	0.26*	0.01	-0.34	2.04	-2.42	1.60
Intention	-0.01	0.01	-0.81	1.20	-1.23	0.88
Time						
Intercept	-0.01**	0.00	-0.77*	0.34	-0.39	0.31
ADP vs. ASTP/BASICS	-0.00	0.00	-0.28	0.48	0.13	0.39
ASTP vs. BASICS	-0.00	0.00	-0.12	0.49	0.81†	0.42
Program	0.01	0.01	0.61	0.73	0.39	0.61
Facilitator	-0.00	0.01	0.75	0.65	0.48	0.62
Intention	-0.00	0.00	-0.32	0.43	-0.12	0.29
Variance Components						
Intercept	0.00***		33.46***		25.07***	
Time slope	0.00***		1.89*		1.89**	

Note. $N = 45$. † $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$. ADP = Alcohol Diversion Program. ASTP = Alcohol Skills Training Program. BASICS = Brief Alcohol Screening and Intervention for College Students.

Table 31

Hierarchical Linear Modeling: Conditional Models for Drinking Outcome Variables by Treatment Condition and Incident Reactions

	BAC		Weekly Drinks		Consequences	
	b	*SE*	*b*	*SE*	*b*	*SE*
Intercept						
Intercept	0.07***	0.01	9.60***	1.01	5.66***	0.72
ADP vs. ASTP/BASICS	0.02	0.01	-0.46	1.67	0.69	0.85
ASTP vs. BASICS	0.01	0.01	1.83	1.04	-0.51	1.08
Internal	-0.00	0.01	0.53	0.78	0.85	0.51
External	-0.00	0.01	-0.85	0.49	-0.28	0.34
Aversiveness	0.00	0.01	-0.38	0.57	-0.33	0.41
Time						
Intercept	-0.01**	0.00	-0.86*	0.34	-0.46	0.34
ADP vs. ASTP/BASICS	-0.01	0.00	-0.13	0.45	0.27	0.37
ASTP vs. BASICS	0.00	0.00	-0.12	0.45	0.87†	0.44
Internal	0.00	0.00	-0.25	0.25	-0.26	0.22
External	0.00**	0.00	0.22	0.14	0.01	0.12
Aversiveness	-0.00*	0.00	-0.34†	0.17	0.21	0.16
Variance Components						
Intercept	0.00***		45.35***		24.53***	
Time slope	0.00**		1.85†		2.00**	

Note. N = 56. † $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$. ADP = Alcohol Diversion Program. ASTP = Alcohol Skills Training Program. BASICS = Brief Alcohol Screening and Intervention for College Students.

Table 32

Hierarchical Regression Analysis Summary for Intervention Techniques Predicting Attitudes at Six Month Follow Up

	Policy Support R^2 = .15 (N = 45, p > .10)				Readiness to Change R^2 = .04 (N = 32, p < .10).			
Variable	*B*	*SE B*	β	*t*	*B*	*SE B*	β	*t*
(constant)	5.22	1.47		3.56***	2.55	0.78		3.26***
Scheduling delay	0.00	0.01	0.02	0.10	0.00	0.01	-0.01	-0.03
Intervention length	-0.01	0.03	-0.09	-0.37	0.00	0.02	-0.04	-0.11
Open questions	-0.02	0.04	-0.11	-0.50	0.00	0.02	0.06	0.22
Closed questions	0.05	0.03	0.34	1.46	0.01	0.02	0.23	0.69
Complex reflections	-0.01	0.05	-0.05	-0.21	-0.01	0.02	-0.11	-0.38
Simple reflections	-0.05	0.06	-0.25	-0.78	0.01	0.04	0.08	0.18
Giving information	0.00	0.02	0.01	0.02	0.00	0.01	-0.09	-0.23

Note. *** p < .001.

Table 33

Hierarchical Regression Analysis Summary for Intervention Techniques Predicting Intervention Satisfaction

	Program Satisfaction R^2 = .20 (N = 39, p < .10)				Facilitator Satisfaction R^2 = .27 (N = 39, p < .10).				Intent to Change R^2 = .17 (N = 39, p < .10).			
Variable	*B*	*SE B*	β	*t*	*B*	*SE B*	β	*t*	*B*	*SE B*	β	*t*
(constant)	3.59	0.54		6.64***	3.60	0.46		7.75***	2.50	0.84		2.97**
Scheduling delay	0.00	0.00	0.23	0.88	0.01	0.00	0.58	2.36*	0.00	0.01	-0.20	-0.76
Intervention length	0.03	0.01	0.66	2.00*	0.02	0.01	0.68	2.16*	0.02	0.02	0.39	1.15
Open questions	-0.03	0.02	-0.37	-1.70	-0.02	0.01	-0.27	-1.28	-0.03	0.03	-0.25	-1.12
Closed questions	-0.01	0.01	-0.20	-0.75	0.00	0.01	-0.10	-0.39	0.01	0.02	0.14	0.55
Complex reflections	0.00	0.02	0.03	0.13	0.01	0.02	0.14	0.64	0.01	0.03	0.11	0.48
Simple reflections	-0.01	0.03	-0.10	-0.27	-0.03	0.02	-0.53	-1.52	-0.01	0.04	-0.14	-0.36
Giving information	-0.01	0.01	-0.49	-1.57	0.00	0.01	-0.19	-0.65	0.00	0.01	0.01	0.04

Note. * p < .05; ** p < .01; *** p < .001.

Table 34

Hierarchical Regression Analysis Summary for Intervention Techniques Predicting Incident Reactions at Six Month Follow Up

	Internal Responsibility R^2 = .27 (N = 32, p > .10)				External Responsibility R^2 = .41 (N = 32, p < .05).				Aversiveness R^2 = .08 (N = 33, p > .10).			
Variable	*B*	*SE B*	β	*t*	*B*	*SE B*	β	*t*	*B*	*SE B*	β	*t*
(constant)	1.78	1.09		1.63	5.03	1.49		3.38**	4.93	0.92		5.35***
Scheduling delay	0.00	0.01	0.15	0.53	-0.02	0.01	-0.50	-1.99†	0.00	0.01	0.19	0.73
Intervention length	0.05	0.03	0.63	1.93†	-0.04	0.04	-0.32	-1.10	-0.05	0.02	-0.71	-2.24*
Open questions	-0.01	0.03	-0.10	-0.43	0.02	0.04	0.08	0.39	0.05	0.03	0.38	1.70
Closed questions	0.05	0.03	0.59	2.00†	0.01	0.04	0.09	0.33	0.00	0.02	0.05	0.18
Complex reflections	0.03	0.03	0.22	0.86	-0.13	0.05	-0.68	-2.96**	-0.06	0.03	-0.53	-2.22*
Simple reflections	-0.09	0.05	-0.74	-1.83†	0.15	0.07	0.80	2.21*	0.03	0.04	0.32	0.84
Giving information	-0.03	0.01	-0.67	-1.97†	0.01	0.02	0.08	0.28	-0.01	0.01	-0.14	-0.43

Note. † p < .10; * p < .05; ** p < .01; *** p < .001.

Table 35

Hierarchical Linear Modeling: Unconditional Models for Mediators

	τ	Intercept			Linear change		
	Correlation: Intercept and Time	*b*	*SE*	Variance Component of *b*	*b*	*SE*	Variance Component of *b*
Defensiveness							
Overall	-0.37**	3.94***	0.14	1.04***	0.41†	0.24	0.72***
Pre-incident	-0.29*	3.93***	0.13	1.03***	0.26	0.20	0.56***
Post-incident	-0.99***	3.84***	0.26	2.04***	-0.00	0.07	0.03
Descriptive norms							
Friends	-0.39**	16.28***	1.04	41.70***	-1.30**	0.46	4.30**
Students	-0.19	12.77***	1.19	43.73***	-1.01*	0.46	0.17
Injunctive norms							
Friends	-0.77***	2.53***	0.13	0.78***	-0.05	0.05	0.06***
Parents	0.71***	1.32***	0.08	0.18***	0.06†	0.03	0.00
Strategies							
PBS	0.80***	3.28***	0.10	0.41***	0.02	0.03	0.00
Expectancies							
Positive	-0.60***	2.62***	0.19	1.16***	-0.17†	0.08	0.08
Negative	-0.42**	2.82***	0.20	0.72	-0.04	0.11	0.15†

Note. $N = 56$. † $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$. PBS = Protective Behavioral Strategies.

Table 36

Hierarchical Linear Modeling: Conditional Models for Mediators by Covariates and Treatment Condition

	Defensiveness: Overall		Defensiveness: Pre-Intervention		Descriptive Norms: Best Friend		Injunctive Norms: Close Friends		Negative Expectancies	
	b	*SE*	*b*	*SE*	*b*	*SE*	*b*	*SE*	*b*	*SE*
Intercept										
Intercept	5.60†	3.03	6.63*	2.60	36.18*	15.82	5.21*	2.21	2.37	3.72
ADP vs. ASTP/BASICS	0.13	0.22	0.13	0.21	1.57	1.58	0.17	0.15	-0.36	0.28
ASTP vs. BASICS	0.10	0.16	0.03	0.16	1.35	1.18	0.26†	0.14	-0.15	0.24
Age	-0.09	0.16	-0.14	0.14	-1.09	0.78	-0.18	0.11	0.05	0.19
Sex	0.09	0.32	0.24	0.30	2.73	2.09	0.99**	0.36	-0.30	0.48
Greek affiliation	-0.11	0.32	-0.14	0.30	-0.99	2.29	0.52	0.39	-0.61	0.50
Time										
Intercept	0.24	0.60	5.87*	2.32	9.77	0.37	-0.46	0.93	0.88	1.56
ADP vs. ASTP/BASICS	-0.02	0.05	-0.57*	0.23	-0.84	0.80	-0.01	0.07	0.21	0.13
ASTP vs. BASICS	0.08*	0.04	-0.24	0.16	0.04	0.48	-0.02	0.06	0.15	0.11
Age	-0.01	0.03	-0.34*	0.13	-0.13	0.49	0.03	0.05	-0.03	0.08
Sex	-0.07	0.09	2.37***	0.43	-2.18†	1.17	-0.34*	0.13	-0.53*	0.20
Greek affiliation	0.10	0.07	0.76*	0.30	-1.90	1.31	-0.13	0.14	-0.11	0.19
Variance Components										
Intercept	0.99***		1.10***		42.17***		0.64***		0.77**	
Time slope	0.00		0.52***		3.87*		0.06**		0.07	

Note. $N = 56$. † $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$. ADP = Alcohol Diversion Program. ASTP = Alcohol Skills Training Program. BASICS = Brief Alcohol Screening and Intervention for College Students.

Table 37

Hierarchical Regression Analysis Summary for Intervention Techniques Predicting Defensiveness at Each Follow Up

	2 Month Defensiveness R^2 = .35 (N = 24, p > .10)				4 Month Defensiveness R^2 = .24 (N = 32, p > .10).				6 Month Defensiveness R^2 = .39 (N = 31, p < .10)			
Variable	*B*	*SE B*	β	*t*	*B*	*SE B*	β	*t*	*B*	*SE B*	β	*t*
(constant)	4.49	1.36		3.31**	4.58	1.01		4.53***	4.93	0.92		5.35***
Scheduling delay	0.01	0.02	0.19	0.70	0.00	0.01	-0.02	-0.08	0.00	0.01	0.19	0.73
Intervention length	-0.06	0.04	-0.78	-1.59	-0.04	0.02	-0.60	-1.75†	-0.05	0.02	-0.71	-2.24*
Open questions	0.02	0.04	0.14	0.48	0.03	0.03	0.26	1.11	0.05	0.03	0.38	1.70
Closed questions	-0.02	0.04	-0.17	-0.48	-0.02	0.03	-0.21	-0.65	0.00	0.02	0.05	0.18
Complex reflections	-0.04	0.06	-0.14	-0.66	0.00	0.03	0.00	0.02	-0.06	0.03	-0.53	-2.22*
Simple reflections	0.12	0.06	0.81	1.95†	0.05	0.05	0.42	1.06	0.03	0.04	0.32	0.84
Giving information	-0.01	0.03	-0.10	-0.23	0.01	0.02	0.14	0.45	-0.01	0.01	-0.14	-0.43

Note. † p < .10; * p < .05; ** p < .01; *** p < .001.

Table 38

Hierarchical Linear Modeling: Conditional Models for Defensiveness by Treatment Condition and Advanced Intervention Techniques

	Defensiveness	
	b	*SE*
Intercept		
Intercept	3.87	0.17
ADP vs. ASTP/BASICS	0.29	0.32
ASTP vs. BASICS	0.08	0.19
Open Questions	-0.01	0.01
Complex Reflections	0.00	0.02
Time		
Intercept	0.00	0.04
ADP vs. ASTP/BASICS	-0.04	0.07
ASTP vs. BASICS	0.10*	0.05
Open Questions	0.01†	0.00
Complex Reflections	-0.01*	0.00
Variance Components		
Intercept	0.85***	
Time slope	0.00	

Note. $N = 56$. † $p < .10$; * $p < .05$; *** $p < .001$. ADP = Alcohol Diversion Program. ASTP = Alcohol Skills Training Program. BASICS = Brief Alcohol Screening and Intervention for College Students.

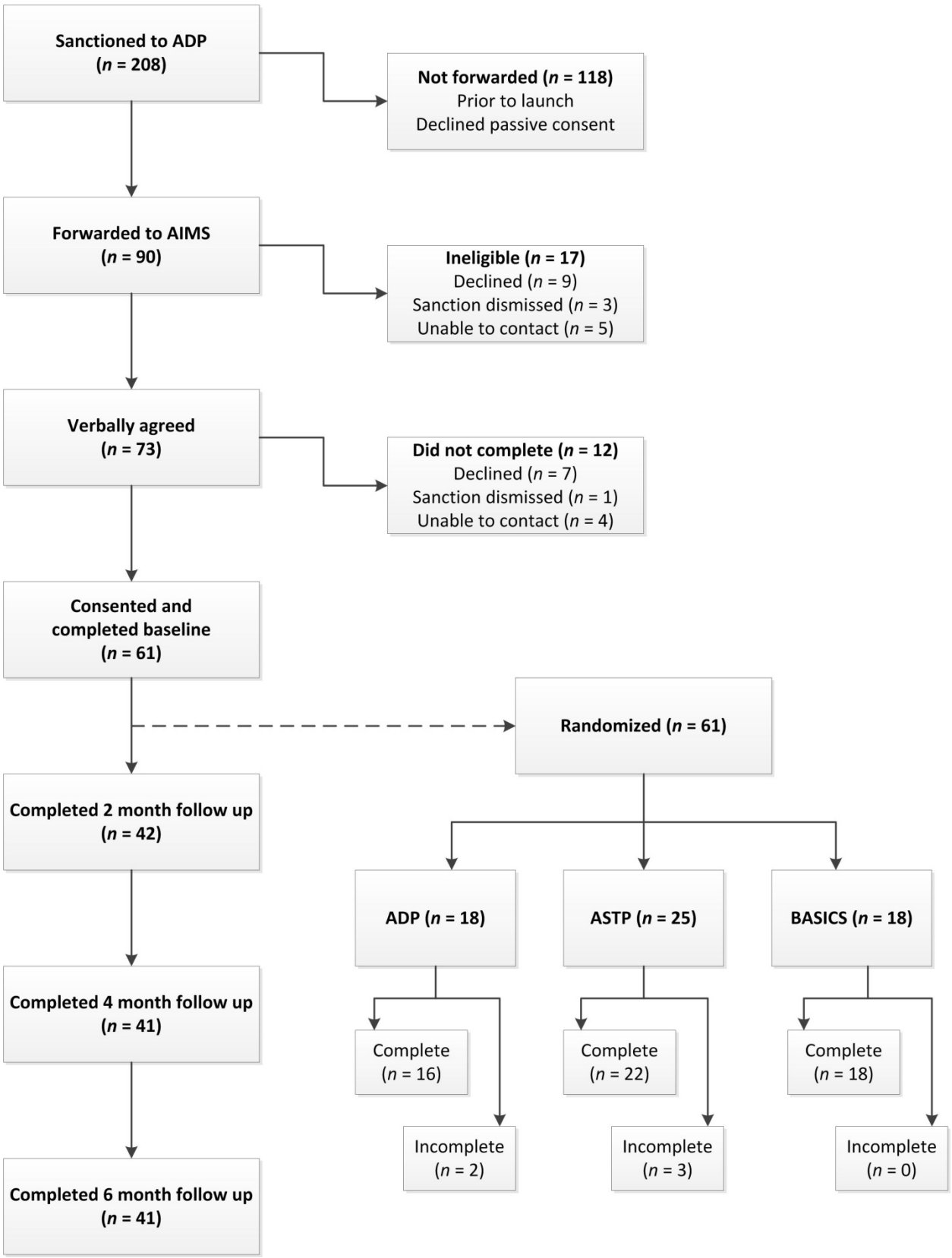

Figure 1. Recruitment flow chart.

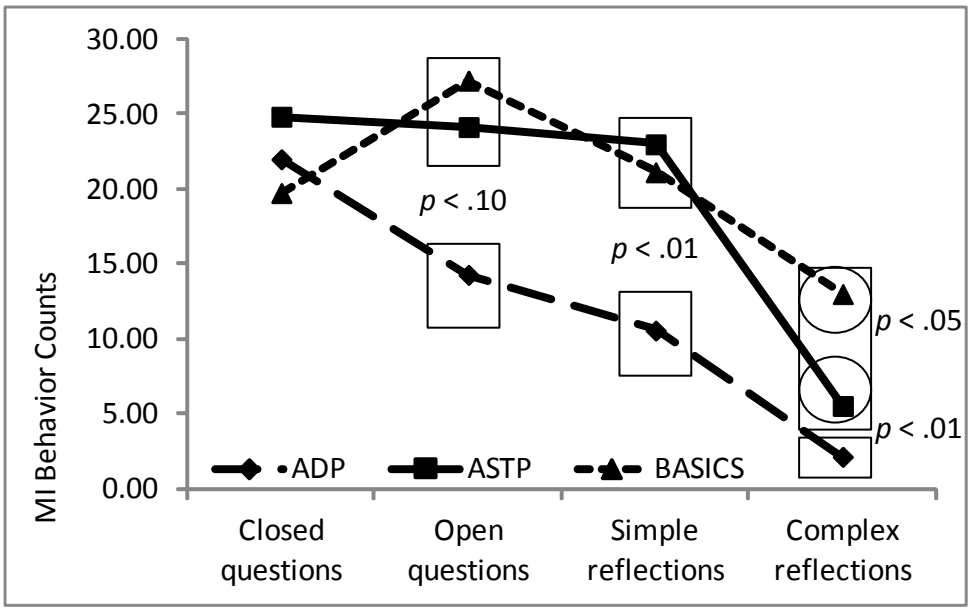

Figure 2. MITI-coded behavior counts by intervention type and significance.
Results in separate boxes are statistically significant.
Results in separate circles are statistically significant.

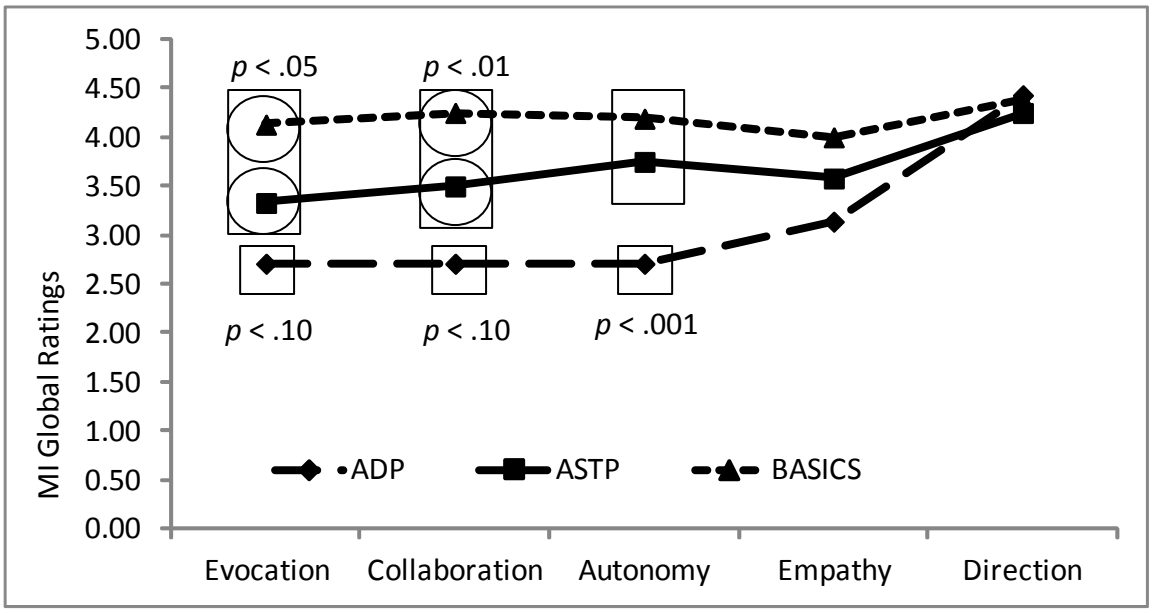

Figure 3. MITI Global Rating scores by intervention.
Results in separate boxes are statistically significant (*p* values below).
Results in separate circles are statistically significant (*p* values above).

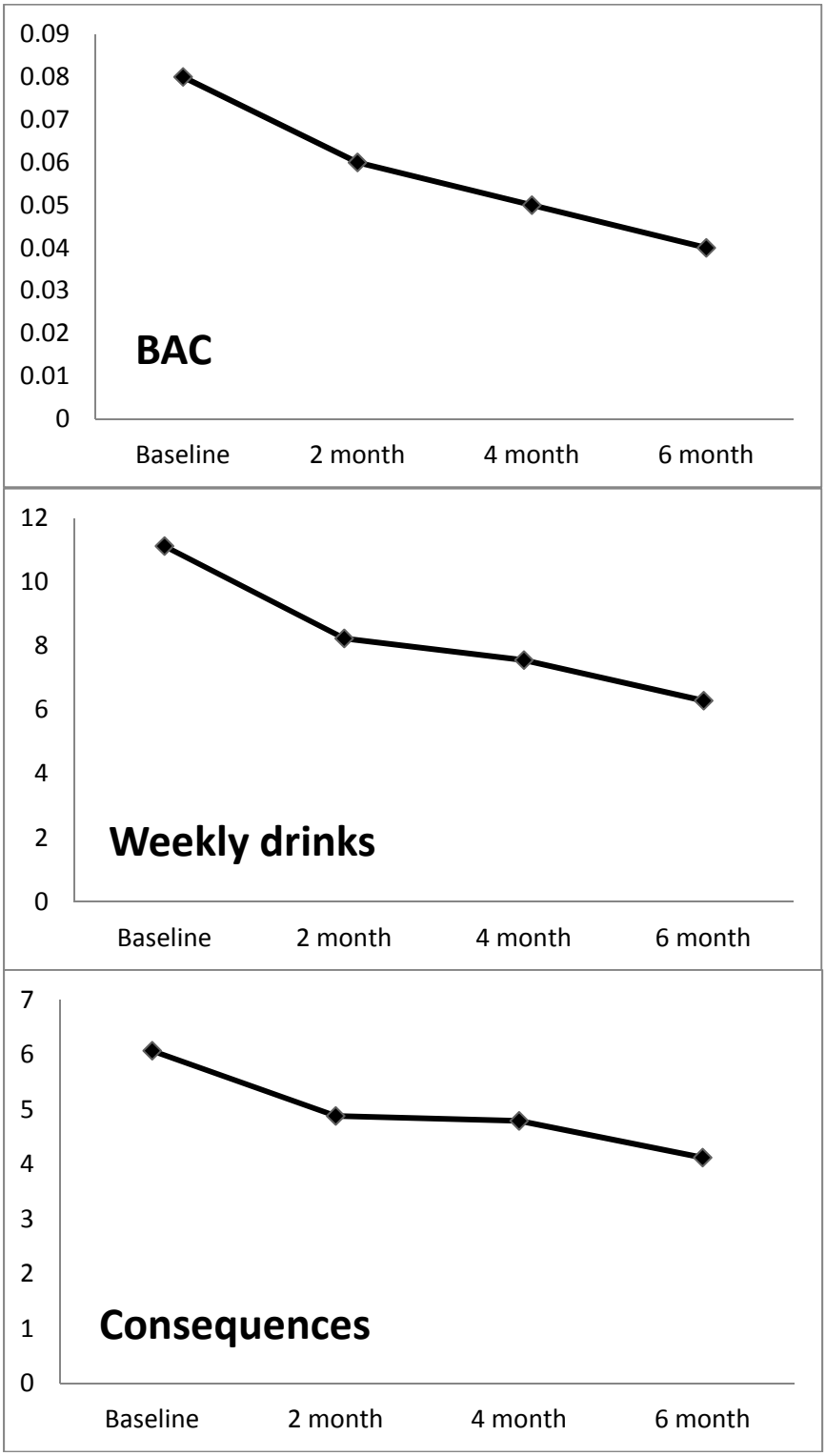

Figure 4. Drinking behavior outcome means over time.

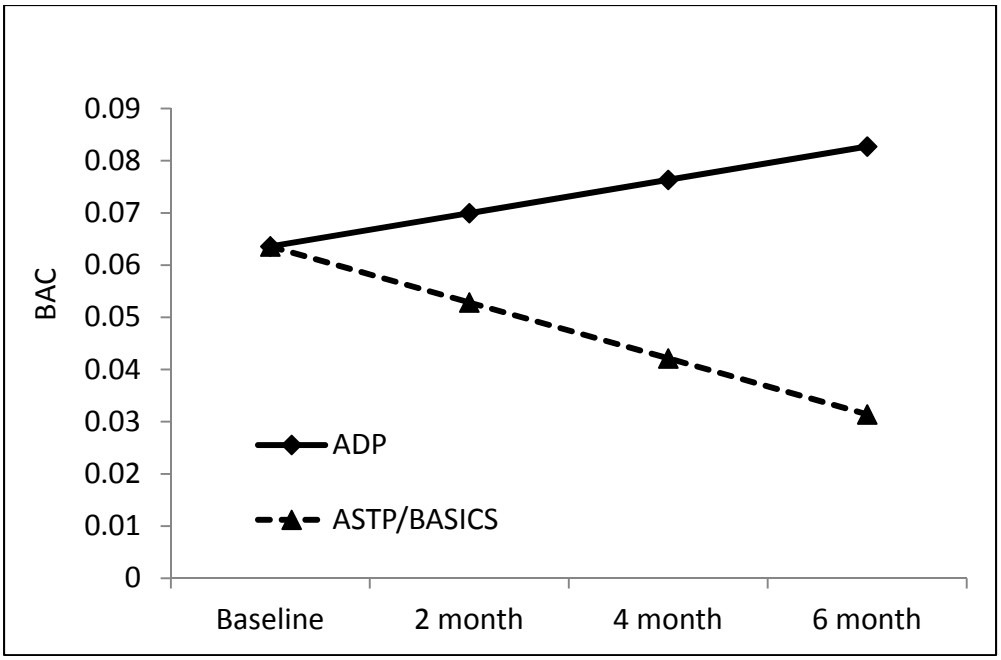

Figure 5. Change in BAC over time by intervention group.

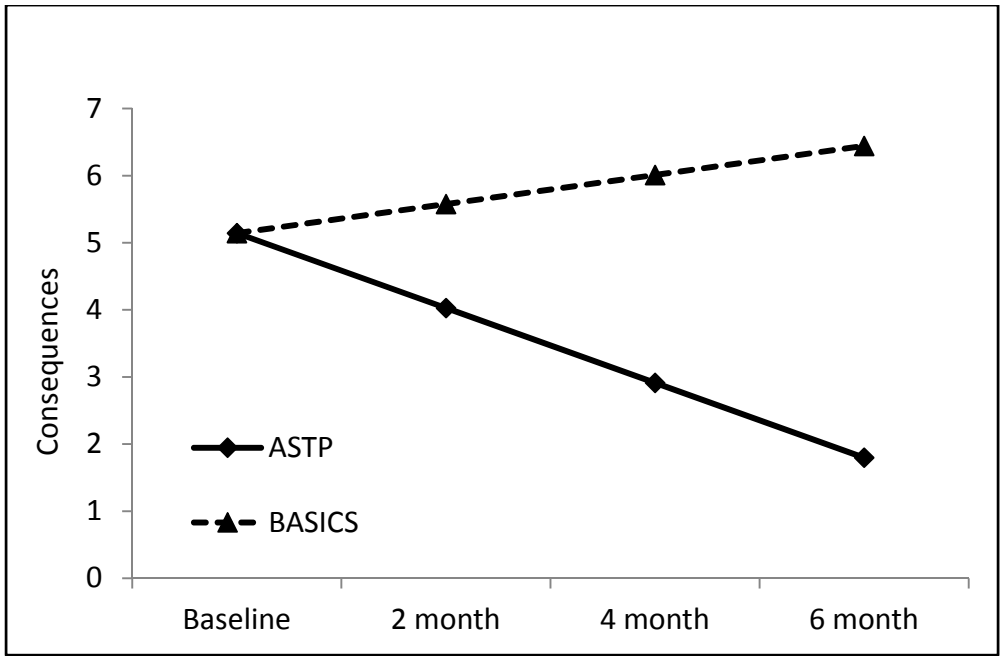

Figure 6. Change in consequences over time by intervention group.

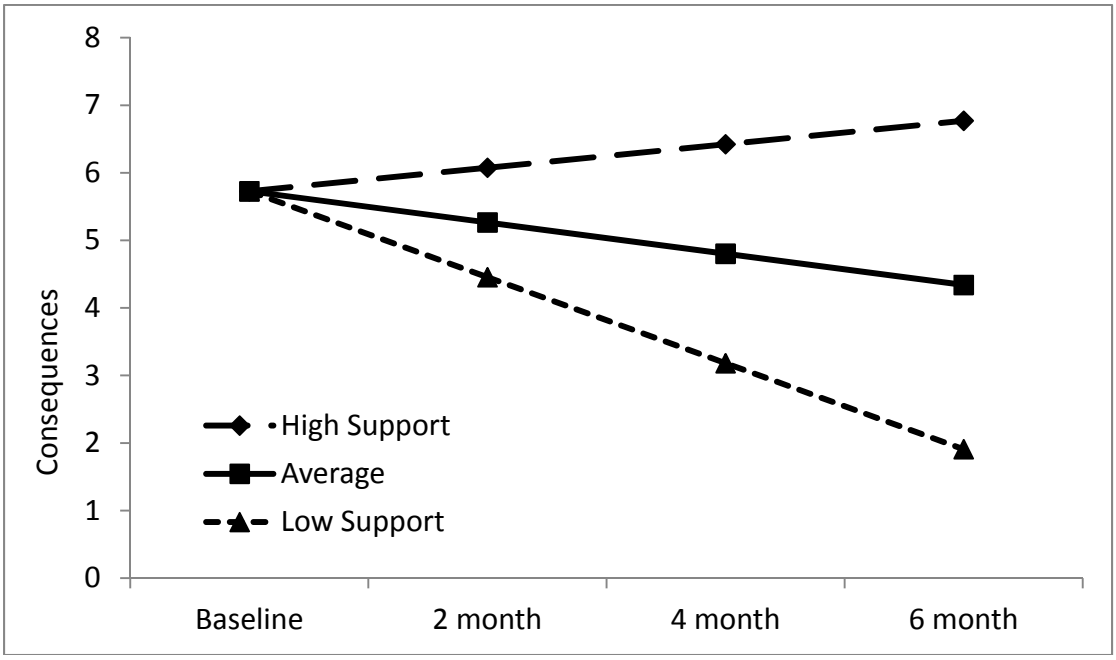

Figure 7. Change in consequences over time at 1 *SD* above and below the mean for baseline policy support.

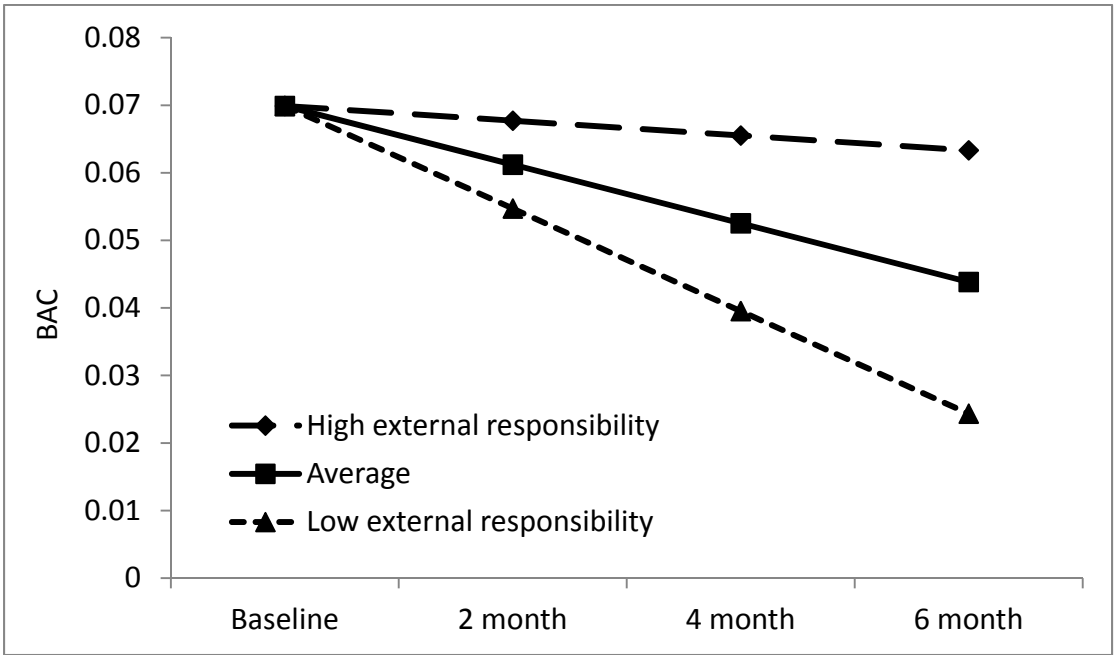

Figure 8. Change in BAC over time at 1 *SD* above and below the mean for external responsibility.

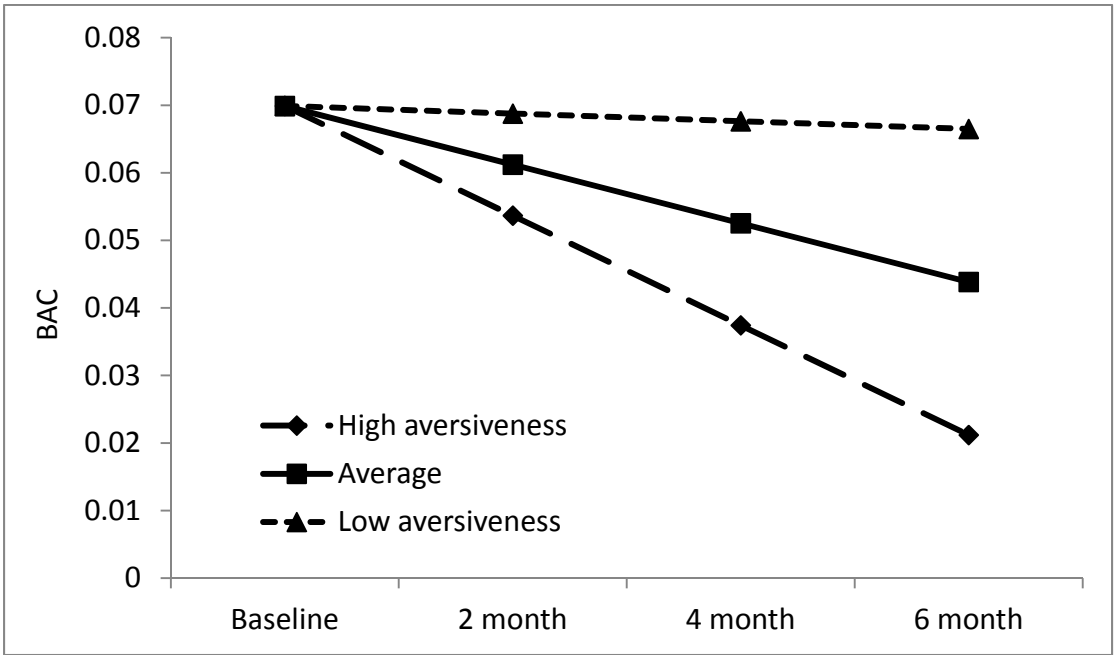

Figure 9. Change in BAC over time at 1 *SD* above and below the mean for perceived incident aversiveness.

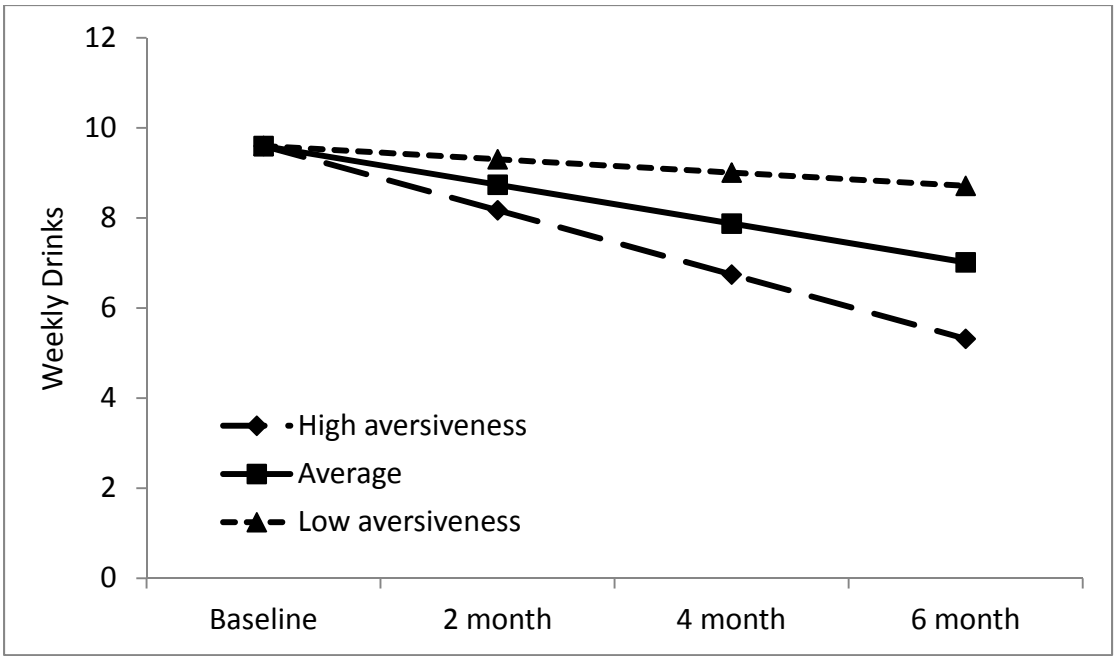

Figure 10. Change in weekly drinks over time at 1 *SD* above and below the mean for perceived incident aversiveness.

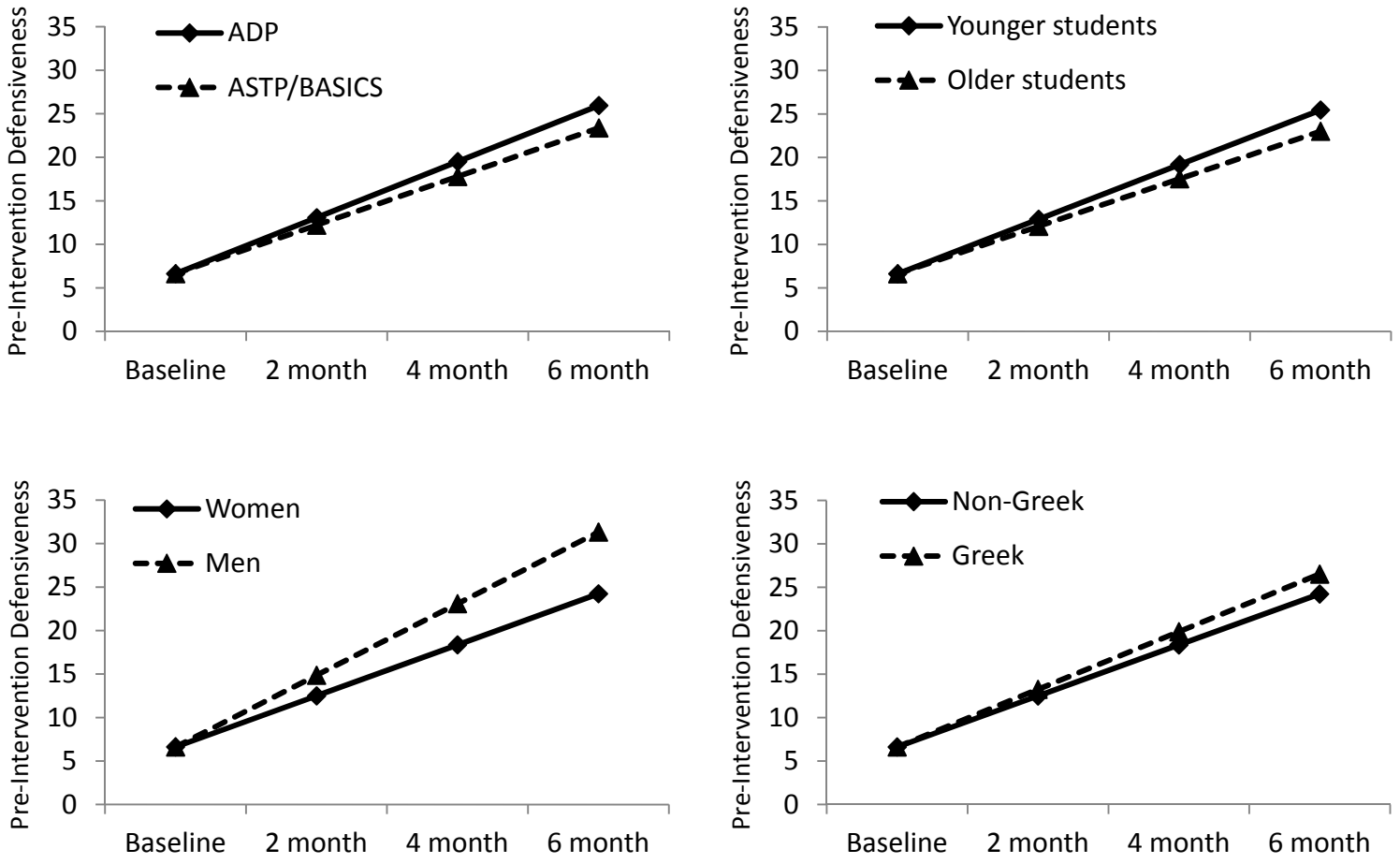

Figure 11. Significant differences in pre-intervention defensiveness over time by intervention condition, age, sex, and Greek affiliation.

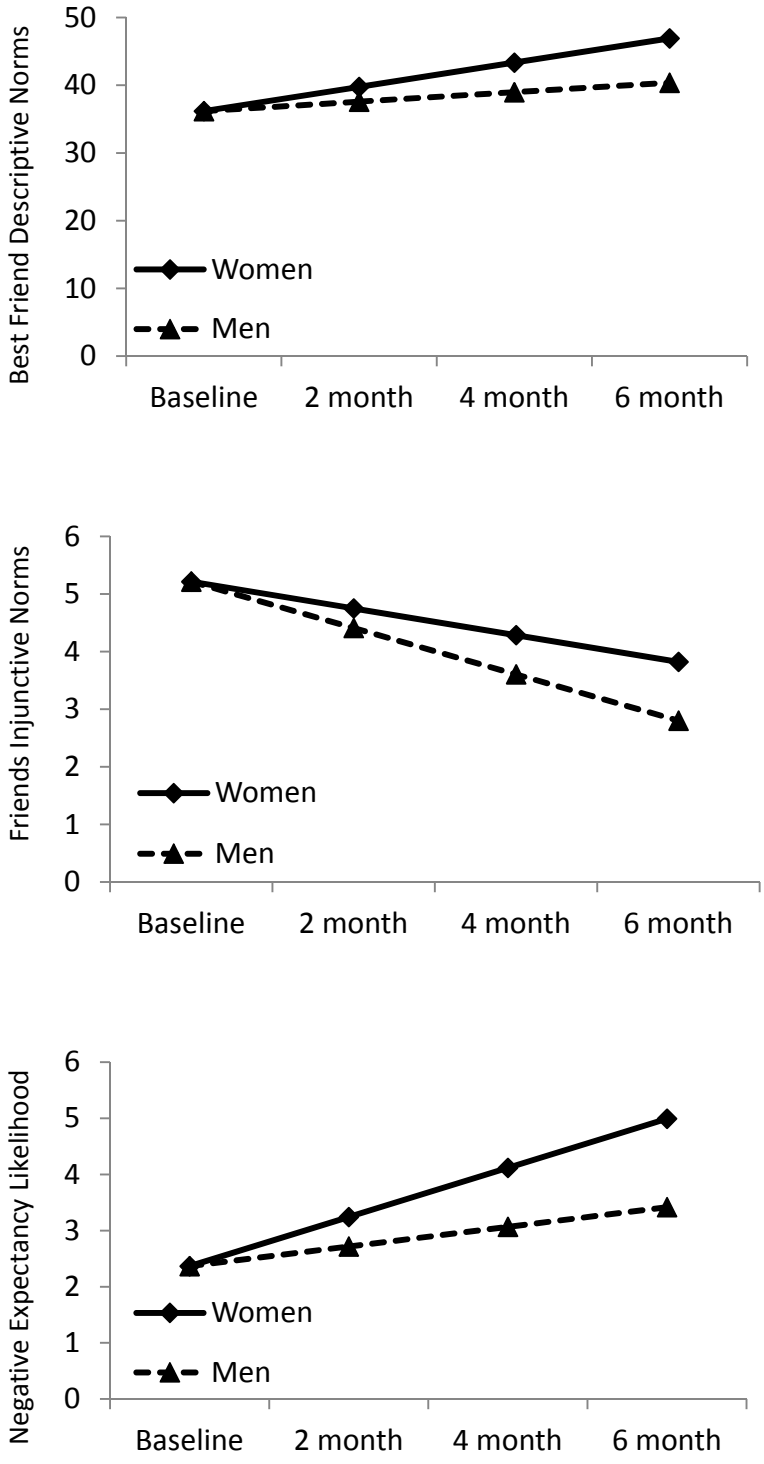

Figure 12. Significant differences in perceived norms and expectancies over time by sex.

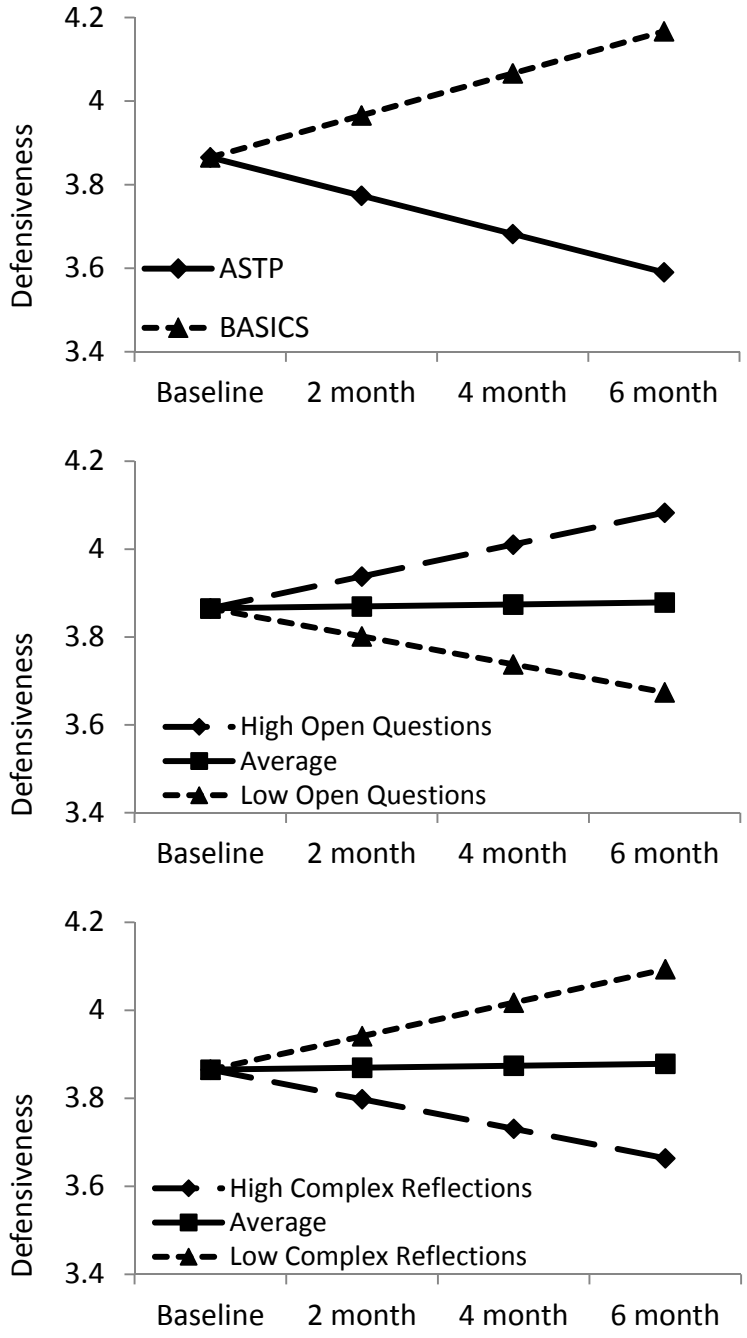

Figure 13. Significant changes in defensiveness over time by intervention and at 1 *SD* above and below the mean for advanced motivational interviewing techniques

Appendix A: MEASURES

MEASURES

Page	Measure	Measure Name	Baseline	2 mo	4 mo	6 mo
2	Dem-pre	Demographics (baseline)	X			
3	Dem-post	Demographics (follow-up)		X	X	X
4	TLFB	Time Line Follow Back	X	X	X	X
5-6	DDQ	Daily Drinking Questionnaire	X	X	X	X
7	RAPI	Rutgers Alcohol Problem Index	X	X	X	X
8	Pol	Policies	X	X	X	X
9	BRCQ	Brief Readiness to Change Questionnaire	X	X	X	X
10	Sat	Satisfaction Survey		X	X	X
11	InRe	Incident Reaction	X	X	X	X
12	Def-pre	Defensiveness (pre)	X	*	*	*
13	Def-post	Defensiveness (post)		X	X	X
14	DNRF	Drinking Norms Rating Form	X	X	X	X
15	AIN	Alcohol Injunctive Norms	X	X	X	X
16	PBSS	Protective Behavioral Strategies Survey	X	X	X	X
17	CEOA	Comprehensive Effects of Alcohol	X	X	X	X

* Pre-incident Defensiveness measure was administered until intervention was complete, at which time the Post-incident Defensiveness measure was substituted.

1. **Age:** _____ years

2. **Date Of Birth:** _____

3. **Height:** _____ ft. _____ in.

4. **Weight:** _____ lbs.

5. **Birth Sex**:
   - ❑ Male
   - ❑ Female

6. **Sexual Identity**
   - ❑ Male
   - ❑ Female
   - ❑ Transgender M to F
   - ❑ Transgender F to M
   - ❑ Other (please specify)

7. **Sexual Orientation**
   - ❑ Bisexual
   - ❑ Gay
   - ❑ Lesbian
   - ❑ Straight/Heterosexual
   - ❑ Questioning

8. **Ethnic Background:**
   - ❑ Non-Hispanic/Non-Latino(a)
   - ❑ Hispanic/Latino(a)

8. **Ethnic Background:**
   - ❑ Asian/Pacific Islander
   - ❑ Black/African American
   - ❑ Native American/American Indian
   - ❑ White/Caucasian
   - ❑ Multiracial
   - ❑ Other (please specify)

9. **Class Standing:**
   - ❑ Freshman
   - ❑ Sophomore
   - ❑ Junior
   - ❑ Senior

10. **Student Status:**
    - ❑ Full-time (12+ credits)
    - ❑ Part-time (1-11 credits)

11. **Most recent semester's GPA:** _____

12. **Where are you living this semester?**
    - ❑ Fraternity or Sorority House
    - ❑ Off-Campus/Apartment/House
    - ❑ Residence Halls/Dorm Room
    - ❑ With Parents

13. **Is your residence currently designated as substance free housing?**
    - ❑ No
    - ❑ Yes

14. **Relationship Status**
    - ❑ Single, not dating
    - ❑ Single, dating
    - ❑ In a serious relationship
    - ❑ Engaged
    - ❑ Married
    - ❑ Divorced

15. **Extracurricular Activities (check all that apply)**
    - ❑ Intercollegiate athletics
    - ❑ Regular attendance at religious services
    - ❑ Volunteering
    - ❑ Political Activism
    - ❑ Intramural athletics
    - ❑ Outdoor clubs
    - ❑ Work
    - ❑ Honors program
    - ❑ Other (please specify)

16. **Are you a member of a fraternity or sorority?**
    - ❑ No
    - ❑ Yes

17. **Have you previously attended any alcohol programs (e.g. AA, DARE, school program, community program, etc.)?**
    - ❑ No
    - ❑ Yes; If yes:

    17a. **What program did you attend?** ___

    17b. **Where did you attend?** _____

    17c. **When did you attend?**
    - ❑ Past year
    - ❑ Past two years
    - ❑ More than two years ago

    17d. **How many session did you attend?**
    - ❑ 1
    - ❑ 2
    - ❑ 3 or more

    17e. **How many hours did you attend?**
    - ❑ 1-2
    - ❑ 3-5
    - ❑ 6 or more

    17f. **Was your attendance:**
    - ❑ Voluntary
    - ❑ Required
    - ❑ Unsure

    17g. **Please rate your satisfaction**
    - ❑ 1 (Very Dissatisfied)
    - ❑ 2 (Somewhat Dissatisfied)
    - ❑ 3 (Neutral)
    - ❑ 4 (Somewhat Satisfied)
    - ❑ 5 (Very Satisfied)

1. **Age:** _____ years

2. **Height:** _____ ft. _____ in.

3. **Weight:** _____ lbs.

4. **Student Status:**
   - ❑ Full-time (12+ credits)
   - ❑ Part-time (1-11 credits)
   - ❑ Summer Break (0 credits)
   - ❑ Not enrolled (0 credits)

5. **Most recent semester's GPA:** _____

6. **Relationship Status**
   - ❑ Single, not dating
   - ❑ Single, dating
   - ❑ In a serious relationship
   - ❑ Engaged
   - ❑ Married
   - ❑ Divorced

7. **Where are you currently living?**
   - ❑ Fraternity or Sorority House
   - ❑ Off-Campus/Apartment/House
   - ❑ Residence Halls/Dorm Room
   - ❑ With Parents

8. **Is your residence currently designated as substance free housing?**
   - ❑ No
   - ❑ Yes

9. **Are you a member of a fraternity or sorority?**
   - ❑ No
   - ❑ Yes

10. **Extracurricular Activities (check all that apply)**
   - ❑ Intercollegiate athletics
   - ❑ Regular attendance at religious services
   - ❑ Volunteering
   - ❑ Political Activism
   - ❑ Intramural athletics
   - ❑ Outdoor clubs
   - ❑ Work
   - ❑ Honors program
   - ❑ Other (please specify)

11. **Have you previously attended any alcohol programs (e.g. AA, DARE, school program, community program, etc.)?**
   - ❑ No
   - ❑ Yes; If yes:

11a. **What program did you attend? ___**

11b. **Where did you attend? _____**

11c. **When did you attend?**
   - ❑ Past year
   - ❑ Past two years
   - ❑ More than two years ago

11d. **How many session did you attend?**
   - ❑ 1
   - ❑ 2
   - ❑ 3 or more

11e. **How many hours did you attend?**
   - ❑ 1-2
   - ❑ 3-5
   - ❑ 6 or more

11f. **Was your attendance:**
   - ❑ Voluntary
   - ❑ Required
   - ❑ Unsure

11g. **Please rate your satisfaction**
   - ❑ 1 (Very Dissatisfied)
   - ❑ 2 (Somewhat Dissatisfied)
   - ❑ 3 (Neutral)
   - ❑ 4 (Somewhat Satisfied)
   - ❑ 5 (Very Satisfied)

To help us evaluate your drinking, we need to get an idea of what your alcohol use was like prior to your incident and what it is currently like. To do this, please complete the following calendar by putting a number (the number of standard drinks you consumed) in **each day**.

Please be as accurate as you can. We know that you won't have perfect recall and that's okay. Please just use your best estimate. We've included major events on the calendar to help.

Remember, on days that you did not drink, please record a "0"

Sample Week:

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
4/13 **0**	4/14 **2**	4/15 **0**	4/16 **0**	4/17 **0**	4/18 **4**	4/19 **6**

For all questions, one drink equals:

12 oz. of beer (8oz. of Canadian, malt liquor, or ice beers or 10 oz. of microbrew)
10 oz. of wine cooler
4 oz. of wine
1 cocktail with 1 oz. of 100 proof liquor or 1 ¼ oz of 80 proof liquor

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
4/13	4/14	4/15	4/16	4/17	4/18	4/19
4/20	4/21	4/22	4/23	4/24	4/25	4/26
4/27	4/28	4/29	4/30	5/1	5/2	5/3
5/4	5/5	5/6	5/7	5/8	5/9	5/10
5/11	5/12	5/13	5/14	5/15	5/16	5/17
5/18	5/19	5/20	5/21	5/22	5/23	5/24

For all questions, one drink equals:

12 oz. of beer (8oz. of Canadian, malt liquor, or ice beers or 10 oz. of microbrew)
10 oz. of wine cooler
4 oz. of wine
1 cocktail with 1 oz. of 100 proof liquor or 1 ¼ oz of 80 proof liquor

1. Think of the **occasion you drank most** this **past month**. How **much** did you drink?

❑ 0 drinks	❑ 5 drinks	❑ 10 drinks	❑ 15 drinks	❑ 20 drinks
❑ 1 drink	❑ 6 drinks	❑ 11 drinks	❑ 16 drinks	❑ 21 drinks
❑ 2 drinks	❑ 7 drinks	❑ 12 drinks	❑ 17 drinks	❑ 22 drinks
❑ 3 drinks	❑ 8 drinks	❑ 13 drinks	❑ 18 drinks	❑ 23 drinks
❑ 4 drinks	❑ 9 drinks	❑ 14 drinks	❑ 19 drinks	❑ 24+ drinks

---

2. Think of the **occasion you drank most** this **past month**. How many **HOURS** did you spend drinking?

❑ 0-1 hour	❑ 3-4 hours	❑ 6-7 hours	❑ 9-10 hours
❑ 1-2 hours	❑ 4-5 hours	❑ 7-8 hours	❑ 10+ hours
❑ 2-3 hours	❑ 5-6 hours	❑ 8-9 hours	

---

3. On a given **weekend evening** during the **past month**, how **much** alcohol did you typically drink? Estimate for the past month.

❑ 0 drinks	❑ 5 drinks	❑ 10 drinks	❑ 15 drinks	❑ 20 drinks
❑ 1 drink	❑ 6 drinks	❑ 11 drinks	❑ 16 drinks	❑ 21 drinks
❑ 2 drinks	❑ 7 drinks	❑ 12 drinks	❑ 17 drinks	❑ 22 drinks
❑ 3 drinks	❑ 8 drinks	❑ 13 drinks	❑ 18 drinks	❑ 23 drinks
❑ 4 drinks	❑ 9 drinks	❑ 14 drinks	❑ 19 drinks	❑ 24+ drinks

---

4. On a given **weekend evening** during the **past month**, how many **HOURS** did you spend drinking? Estimate for the past month.

❑ 0-1 hour	❑ 3-4 hours	❑ 6-7 hours	❑ 9-10 hours
❑ 1-2 hours	❑ 4-5 hours	❑ 7-8 hours	❑ 10+ hours
❑ 2-3 hours	❑ 5-6 hours	❑ 8-9 hours	

---

5. How many days of the week did you drink alcohol during the **past month**?

❑ I do not drink at all.	❑ Once or twice a week.	❑ Nearly every day.
❑ About once a month.	❑ Three to four times a week.	❑ Once a day or more.
❑ Two to three times a month.		

For all questions, one drink equals:

12 oz. of beer (8oz. of Canadian, malt liquor, or ice beers or 10 oz. of microbrew)
10 oz. of wine cooler
4 oz. of wine
1 cocktail with 1 oz. of 100 proof liquor or 1 ¼ oz of 80 proof liquor

Consider a typical week during the last three months. How much alcohol, on average, (measured in number of drinks as defined at the top of the page), do you drink on each day of a typical week? Over how many hours do you drink that number of drinks?

1. On a typical MONDAY, I have	_____	drinks in	____	hours.
2. On a typical TUESDAY, I have	_____	drinks in	____	hours.
3. On a typical WEDNESDAY, I have	_____	drinks in	____	hours.
4. On a typical THURSDAY, I have	_____	drinks in	____	hours.
5. On a typical FRIDAY, I have	_____	drinks in	____	hours.
6. On a typical SATURDAY, I have	_____	drinks in	____	hours.
7. On a typical SUNDAY, I have	_____	drinks in	____	hours.

How many times did the following things happen to you *while* you were drinking or *because of* your alcohol use during the **last 3 months**? Please select the number corresponding to your answer.	Never	1 to 2 times	3 to 5 times	6 to 10 times	More than 10
1. Not able to do your homework or study for a test?	0	1	2	3	4
2. Got into fights, acted bad, or did mean things?	0	1	2	3	4
3. Missed out on other things because you spent too much money on alcohol?	0	1	2	3	4
4. Went to work or school high or drunk?	0	1	2	3	4
5. Caused shame or embarrassment to someone?	0	1	2	3	4
6. Neglected your responsibilities?	0	1	2	3	4
7. Relative avoided you?	0	1	2	3	4
8. Felt that you needed more alcohol than you used to use in order to get the same effect?	0	1	2	3	4
9. Tried to control your drinking by trying to drink only at certain times of the day or in certain places?	0	1	2	3	4
10. Had withdrawal symptoms, that is, felt sick because you stopped or cut down on drinking?	0	1	2	3	4
11. Noticed a change in your personality?	0	1	2	3	4
12. Felt that you had a problem with alcohol?	0	1	2	3	4
13. Missed a day (or part of a day) of school or work?	0	1	2	3	4
14. Tried to cut down or quit drinking?	0	1	2	3	4
15. Suddenly found yourself in a place that you could not remember getting to?	0	1	2	3	4
16. Passed out or fainted suddenly?	0	1	2	3	4
17. Had a fight, argument, or bad feelings with a friend?	0	1	2	3	4
18. Had a fight, argument, or bad feelings with a family member?	0	1	2	3	4
19. Kept drinking when you promised yourself not to?	0	1	2	3	4
20. Felt you were going crazy?	0	1	2	3	4
21. Had a bad time?	0	1	2	3	4
22. Felt physically or psychologically dependent?	0	1	2	3	4
23. Was told by a friend or neighbor to stop or cut down drinking?	0	1	2	3	4
24. Drove shortly after having more than two drinks?	0	1	2	3	4
25. Drove shortly after having more than four drinks?	0	1	2	3	4

Following are ten statements about your thoughts regarding campus substance use policies. Please indicate how much you agree with each of the statements.	Strongly disagree	Moderately disagree	Disagree a little	Neither agree nor disagree	Agree a little	Moderately agree	Strongly agree
1. I am aware of the substance use policies on my campus.	1	2	3	4	5	6	7
2. I support the substance use policies on my campus.	1	2	3	4	5	6	7
3. The substance use policies on my campus are too strict.	1	2	3	4	5	6	7
4. The substance use policies on my campus are too lenient.	1	2	3	4	5	6	7
5. The substance use policies on my campus are enforced.	1	2	3	4	5	6	7
6. The substance use policies on my campus are effective.	1	2	3	4	5	6	7

The following section is designed to identify how you personally feel about your drinking right now. Please read each of the statements below carefully, and then decide whether you agree or disagree with the statements. Please indicate how much you agree with the following statements.	Strongly Disagree	Disagree	Unsure	Agree	Strongly Agree
1. I don't think I drink too much.	1	2	3	4	5
2. I am trying to drink less than I used to.	1	2	3	4	5
3. I enjoy my drinking, but sometimes I drink too much.	1	2	3	4	5
4. Sometimes I think I should cut down on my drinking.	1	2	3	4	5
5. It's a waste of time thinking about my drinking.	1	2	3	4	5
6. I have just recently changed my drinking habits.	1	2	3	4	5
7. Anyone can talk about wanting to do something about drinking, but I am actually doing something about it.	1	2	3	4	5
8. I am at the stage where I should think about drinking less alcohol.	1	2	3	4	5
9. My drinking is a problem sometimes.	1	2	3	4	5
10. There is no need for me to think about changing my drinking.	1	2	3	4	5
11. I am actually changing my drinking habits right now.	1	2	3	4	5
12. Drinking less alcohol would be pointless for me.	1	2	3	4	5

The [Alcohol Skills Training Program/BASICS Feedback/Alcohol Education Group] you have just completed is part of the alcohol and drug education program conducted at the University of Tennessee Knoxville. We would greatly appreciate feedback from you about the workshop.

	Please indicate how much you agree with the following statements.	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
1.	The information presented was interesting and helpful.	1	2	3	4	5
2.	I learned new facts about alcohol.	1	2	3	4	5
3.	The workshop was what I expected.	1	2	3	4	5
4.	The workshop was thorough and complete.	1	2	3	4	5
5.	The facilitator(s) seemed well-organized.	1	2	3	4	5
6.	The facilitator(s) seemed competent and well-trained.	1	2	3	4	5
7.	The facilitator(s) seemed warm and understanding.	1	2	3	4	5
8.	The facilitator(s) seemed well informed about what goes on in the University setting.	1	2	3	4	5
9.	The information I received will cause me to think differently about alcohol.	1	2	3	4	5
10.	The information I received will cause me to change my pattern of alcohol use.	1	2	3	4	5
11.	I left the presentation with a specific goal in mind about changing my drinking habits.	1	2	3	4	5
12.	I would recommend this workshop to a friend.	1	2	3	4	5

13. What part of the workshop was MOST USEFUL?

14. What part of the workshop was LEAST USEFUL?

15. What information was MOST SURPRISING?

16. What would you like to have learned MORE about?

17. How could this workshop be IMPROVED?

Sat

Following are 11 statements about the incident that led to your referral to this program.

Please indicate your response to each of the following questions.	Not at all		Somewhat		Mostly		Totally
1. To what extent do you believe your alcohol consumption was responsible for this incident?	1	2	3	4	5	6	7
2. To what extent was the incident your own fault?	1	2	3	4	5	6	7
3. To what extent do you believe someone else's alcohol consumption was responsible for this incident?	1	2	3	4	5	6	7
4. To what extent was the incident someone else's fault?	1	2	3	4	5	6	7
5. To what extent do you believe your own risk taking behavior was responsible for this incident?	1	2	3	4	5	6	7

Please indicate your response to each of the following questions.	Not at all		Somewhat		A lot		Extremely
6. To what extent has this incident upset you?	1	2	3	4	5	6	7
7. How badly do you feel about this incident?	1	2	3	4	5	6	7
8. How much physical pain or harm has this incident caused?	1	2	3	4	5	6	7
9. How unpleasant has this incident been for you?	1	2	3	4	5	6	7

Please indicate your response to the following question.	Totally controllably by you					Totally controllable by other people
10. Was the cause of the incident:	1	2	3	4	5	6	7

11. To what do you attribute the incident? (select all that apply)

- ❑ Pressure from others
- ❑ Just having fun
- ❑ Too intoxicated to think clearly
- ❑ Carelessness
- ❑ Poor judgment
- ❑ Stupid rules
- ❑ Bad luck
- ❑ Fate
- ❑ Someone's overreaction
- ❑ Other (explain) _____

Following are ten statements about your thoughts regarding the [Alcohol Skills Training Program/BASICS Feedback/Alcohol Education Group] you will be attending. Please indicate how much you agree with each of the statements using the following scale.	Strongly disagree	Moderately disagree	Disagree a little	Neither agree nor disagree	Agree a little	Moderately agree	Strongly agree
1. I am genuinely interested in the [ASTP/BASICS/AE].	1	2	3	4	5	6	7
2. I am interested in knowing more about my drinking.	1	2	3	4	5	6	7
3. I am interested in learning how my drinking compares to other students.	1	2	3	4	5	6	7
4. I am open-minded about [ASTP/BASICS/AE].	1	2	3	4	5	6	7
5. Attending the [ASTP/BASICS/AE] will be a waste of my time.	1	2	3	4	5	6	7
6. The [ASTP/BASICS/AE] might benefit me.	1	2	3	4	5	6	7
7. I am not like the people the [ASTP/BASICS/AE] was designed for.	1	2	3	4	5	6	7
8. I might make some changes in my drinking as a result of attending [ASTP/BASICS/AE].	1	2	3	4	5	6	7
9. The [ASTP/BASICS/AE] may have information that was useful for me.	1	2	3	4	5	6	7
10. Attending the [ASTP/BASICS/AE] feels like punishment.	1	2	3	4	5	6	7

Following are five types of alcohol programs. Please indicate how interested you would be in each one using the following scale.	Very uninterested	Somewhat uninterested	Neutral	Somewhat interested	Very interested
1. An interactive group workshop with peers	1	2	3	4	5
2. A classroom-format education group	1	2	3	4	5
3. A one-to-one feedback session	1	2	3	4	5
4. An interactive computer program	1	2	3	4	5
5. Feedback and information mailed/e-mailed to you	1	2	3	4	5

Following are ten statements about your thoughts regarding the [Alcohol Skills Training Program/BASICS Feedback/Alcohol Education Group] you attended. Please indicate how much you agree with each of the statements using the following scale.	Strongly disagree	Moderately disagree	Disagree a little	Neither agree nor disagree	Agree a little	Moderately agree	Strongly agree
1. I was genuinely interested in the [ASTP/BASICS/AE].	1	2	3	4	5	6	7
2. I was interested in knowing more about my drinking.	1	2	3	4	5	6	7
3. I was interested in learning how my drinking compares to other students.	1	2	3	4	5	6	7
4. I was open-minded about [ASTP/BASICS/AE].	1	2	3	4	5	6	7
5. Attending the [ASTP/BASICS/AE] was a waste of my time.	1	2	3	4	5	6	7
6. I may have benefited from attending the [ASTP/BASICS/AE].	1	2	3	4	5	6	7
7. I was not like the people the [ASTP/BASICS/AE] was designed for.	1	2	3	4	5	6	7
8. I have made some changes in my drinking as a result of attending [ASTP/BASICS/AE].	1	2	3	4	5	6	7
9. The [ASTP/BASICS/AE] had information that was useful for me.	1	2	3	4	5	6	7
10. Attending the [ASTP/BASICS/AE] felt like punishment.	1	2	3	4	5	6	7

Following are five types of alcohol programs. Please indicate how interested you would be in each one using the following scale.	Very uninterested	Somewhat uninterested	Neutral	Somewhat interested	Very interested
1. An interactive group workshop with peers	1	2	3	4	5
2. A classroom-format education group	1	2	3	4	5
3. A one-to-one feedback session	1	2	3	4	5
4. An interactive computer program	1	2	3	4	5
5. Feedback and information mailed/e-mailed to you	1	2	3	4	5

For all questions, one drink equals:

12 oz. of beer (8oz. of Canadian, malt liquor, or ice beers or 10 oz. of microbrew)
10 oz. of wine cooler
4 oz. of wine
1 cocktail with 1 oz. of 100 proof liquor or 1 ¼ oz of 80 proof liquor

1. Consider a typical week during the last three months. How much alcohol, on average (measured in number of drinks), does your **best friend** drink on each day of a typical week?

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday

2. Consider a typical week during the last three months. How much alcohol, on average (measured in number of drinks), does a **typical student of your same sex living in the dorms** at this University drink on each day of a typical week?

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday

3. Consider a typical week during the last three months. How much alcohol, on average (measured in number of drinks), does a **typical student of your same sex living elsewhere** at this University drink on each day of a typical week?

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday

4. How often do you think a **typical student of your same sex living in the dorms** at this University consumes alcohol?

❑ Does not drink at all.	❑ Once or twice a week.	❑ Nearly every day.
❑ About once a month.	❑ Three to four times a week.	❑ Once a day or more.
❑ Two to three times a month.		

5. How often do you think a **typical student of your same sex living elsewhere** at this University consumes alcohol?

❑ Does not drink at all.	❑ Once or twice a week.	❑ Nearly every day.
❑ About once a month.	❑ Three to four times a week.	❑ Once a day or more.
❑ Two to three times a month.		

How much do you think the following people approve of **drinking alcohol every weekend?**	Strongly Disapprove	Moderately Disapprove	Slightly Disapprove	Neither Approve nor Disapprove	Slightly Approve	Moderately Approve	Strongly Approve
Yourself	1	2	3	4	5	6	7
Your closest friends	1	2	3	4	5	6	7
Your parents	1	2	3	4	5	6	7
Typical UT students	1	2	3	4	5	6	7

How much do you think the following people approve of **drinking alcohol daily?**	Strongly Disapprove	Moderately Disapprove	Slightly Disapprove	Neither Approve nor Disapprove	Slightly Approve	Moderately Approve	Strongly Approve
Yourself	1	2	3	4	5	6	7
Your closest friends	1	2	3	4	5	6	7
Your parents	1	2	3	4	5	6	7
Typical UT students	1	2	3	4	5	6	7

How much do you think the following people approve of **driving a car after drinking?**	Strongly Disapprove	Moderately Disapprove	Slightly Disapprove	Neither Approve nor Disapprove	Slightly Approve	Moderately Approve	Strongly Approve
Yourself	1	2	3	4	5	6	7
Your closest friends	1	2	3	4	5	6	7
Your parents	1	2	3	4	5	6	7
Typical UT students	1	2	3	4	5	6	7

How much do you think the following people approve of **drinking enough to pass out?**	Strongly Disapprove	Moderately Disapprove	Slightly Disapprove	Neither Approve nor Disapprove	Slightly Approve	Moderately Approve	Strongly Approve
Yourself	1	2	3	4	5	6	7
Your closest friends	1	2	3	4	5	6	7
Your parents	1	2	3	4	5	6	7
Typical UT students	1	2	3	4	5	6	7

Please indicate the degree to which you engage in the following behaviors when using alcohol or “partying.”	N/A, don't drink	Never	Rarely	Sometimes	Usually	Always
1. Determine not to exceed a set number of drinks.	0	1	2	3	4	5
2. Alternate alcoholic and non-alcoholic drinks.	0	1	2	3	4	5
3. Have a friend let you know when you've had enough.	0	1	2	3	4	5
4. Leave the bar/party at a predetermined time.	0	1	2	3	4	5
5. Stop drinking at a predetermined time.	0	1	2	3	4	5
6. Drink water while drinking alcohol.	0	1	2	3	4	5
7. Put extra ice in your drink.	0	1	2	3	4	5
8. Avoid drinking games.	0	1	2	3	4	5
9. Drink shots of liquor.	0	1	2	3	4	5
10. Avoid mixing different types of alcohol.	0	1	2	3	4	5
11. Drink slowly, rather than gulp or chug.	0	1	2	3	4	5
12. Avoid trying to 'keep up' or out-drink others.	0	1	2	3	4	5
13. Use a designated driver.	0	1	2	3	4	5
14. Make sure that you go home with a friend.	0	1	2	3	4	5
15. Know where your drink has been at all times.	0	1	2	3	4	5
16. Choose not to drink alcohol.	0	1	2	3	4	5
17. Eat before and/or during drinking.	0	1	2	3	4	5
18. Keep track of how many drinks you having.	0	1	2	3	4	5
19. 3Pace your drinks to 1 or fewer per hour.	0	1	2	3	4	5

This section assesses what you would expect to happen if you were under the influence of alcohol. Check a response from **disagree** to **agree**, depending on whether or not you would expect the effect to happen to you if you were under the influence of alcohol. These effects will vary, depending upon the amount of alcohol you typically consume. This is not a personality assessment. We want to know what you would expect to happen if you were to drink alcohol, not how you are when you are sober. **Example**: If you are always emotional, you would not mark agree as your answer for statement "*I would be emotional*" unless you expected to become MORE EMOTIONAL if you drank. **IF I WERE UNDER THE INFLUENCE OF ALCOHOL…**	Strongly Disagree	Disagree	Agree	Strongly Agree
1. I would enjoy sex more	1	2	3	4
2. I would feel dizzy	1	2	3	4
3. I would feel clumsy	1	2	3	4
4. I would be loud, boisterous, or noisy	1	2	3	4
5. I would feel peaceful	1	2	3	4
6. I would be brave and daring	1	2	3	4
7. I would be courageous	1	2	3	4
8. I would act aggressively	1	2	3	4
9. I would feel guilty	1	2	3	4
10. I would feel calm	1	2	3	4
11. I would feel moody	1	2	3	4
12. It would be easier to talk to people	1	2	3	4
13. I would be a better lover	1	2	3	4
14. I would take risks	1	2	3	4
15. I would act sociable	1	2	3	4

This section assesses whether you think each effect, which may result from drinking alcohol, is bad or good. Check a response from **bad** to **good**, depending on whether or not you think this particular effect is bad, neutral, or good, etc. We want to know if you think a particular effect is bad or good, REGARDLESS of whether you expect it to happen to YOU personally when you drink alcohol. **THE EFFECT OF ALCOHOL . . .**	Bad	Slightly Bad	Neutral	Slightly Good	Good
16. Enjoying sex more	1	2	3	4	5
17. Feeling dizzy	1	2	3	4	5
18. Being clumsy	1	2	3	4	5
19. Being loud, boisterous, or noisy	1	2	3	4	5
20. Feeling peaceful	1	2	3	4	5
21. Being brave and daring	1	2	3	4	5
22. Being courageous	1	2	3	4	5
23. Acting aggressively	1	2	3	4	5
24. Feeling guilty	1	2	3	4	5
25. Feeling calm	1	2	3	4	5
26. Feeling moody	1	2	3	4	5
27. Being easier to talk to people	1	2	3	4	5
28. Being a better lover	1	2	3	4	5
29. Taking risks	1	2	3	4	5
30. Acting sociable	1	2	3	4	5

Diane E. Logan

Curriculum Vitae

Department of Psychology
University of Washington
Box 351629
Seattle, WA 98195-1629

Phone: 206.543.5642
Fax: 206.685.1310
E-Mail: logande@uw.edu

EDUCATION

2005-present University of Washington, Seattle
2007 M.S., Psychology
2008 Ph.C., Clinical Psychology
Pursuing Ph.D., Adult Clinical Psychology
Advisor: G. Alan Marlatt, Ph.D. (deceased)
Advisor: Mary E. Larimer, Ph.D.
Co-Advisor: Kevin M. King, Ph.D.

2012-2013 *Greater Hartford Clinical Psychology Internship Consortium (VA), Newington, Connecticut*
APA Internship

2002-2005 The Evergreen State College, Olympia, Washington
B.A., Liberal Arts

1996-1997 The Evergreen State College, Olympia, Washington
Pursuing B.A.

1995-1996 Youngstown State University, Youngstown, Ohio
Early entrance senior year of high school

AWARDS

2009-2012 1F31AA018238-01A1 Alcohol Interventions for Mandated Students (Project AIMS). National Institute on Alcohol Abuse and Alcoholism, Individual National Research Service Award. $85,797. G. Alan Marlatt (Mary E. Larimer) and Jason R. Kilmer, Co-Sponsors.

2012 University of Washington Graduate School Presidential Dissertation Fellowship. One quarter of funding plus tuition waiver.

2011 NIAAA T32 Training Directors Meeting and Trainee Workshop Travel Award. Air/hotel expenses.

2009 Virginia A. Roswell Dissertation Award, Association for Behavioral and Cognitive Therapies (ABCT). $1,000.

Bolles Fellowship Support, University of Washington, Psychology Department, $1,250.

Margaret J. Barr Student Research Award, The Network, Department of Education, $5,000.

2008 American Psychological Association (APA) Dissertation Research Award, APA Science Directorate. $1,000.

2005 Scholarship recipient to attend Washington State Coalition on Women's Substance Abuse Issues: Going Deeper – Women Living with Addiction and Other Life Challenges conference.

1996-1997 Scholarship for full undergraduate tuition to The Evergreen State College.

PUBLICATIONS

Peer Reviewed Journals

Logan, D. E., Henry, T., Vaughn, M., Luk, J. W., & King, K. M. (in press). Rose-Colored Beer Goggles: The Relationship between Experiencing Consequences and Perceived Likelihood and Valence. *Psychology of Addictive Behaviors.*

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Blume, A., & **Logan, D. E.** (in press). Harm reduction approaches. In P. Miller (Ed.), *The Encyclopedia of Addictive Behaviors.* Elsevier: San Diego.

Collins, S. E., Clifasefi, S. L., **Logan, D. E.**, Samples, L., Somers, J., & Marlatt, G. A. (in press). Seeing the writing on the wall: A lesson in harm reduction. In K. Witkiewitz, M. E. Larimer, & G. A. Marlatt, (Eds.) *Harm Reduction: Pragmatic Strategies for Managing High-Risk Behaviors (2nd Edition).* Guilford Press: New York.

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Logan, D. E. & Carlini-Marlatt, B. (2004). Smoking and adolescence: some issues on prevention and cessation. Online publication: www.mentorfoundation.org.

CONFERENCE PRESENTATIONS

Logan, D. E., Henry, T., Vaughn, M., Luk, J. W., & King, K. M. (2012). Rose-colored beer goggles: The Relationship between experiencing consequences and perceived likelihood and valence. Poster submitted for presentation at the annual meeting of the Association for Behavioral and Cognitive Therapies, National Harbor, MD.

Logan, D. E., Lewis, M. A., Kilmer, J. R., Mastroleo, N. R., & Larimer, M. E. (2012). The impact of perceptions of responsibility and defensiveness on pre-intervention drinking changes among mandated students. Poster submitted for presentation at the annual meeting of the Association for Behavioral and Cognitive Therapies, National Harbor, MD.

Walter, T., Kilmer, J. R., **Logan, D. E.**, & Lee, C. M. (2012). Beyond the munchies: Self-reported marijuana consequences and implications for intervention research. Poster presented at the Society for Research on Adolescence, Vancouver, BC.

Logan, D. E., Kilmer, J. R., & Larimer, M. E. (2011). Factors impacting incident attributions among mandated students. Paper presented at the NIAAA T32 Training Directors Meeting and Trainee Workshop, Providence, RI.

Koo, K. H., Pedersen, E. R., Hsu, S., **Logan, D. E.**, & Larimer, M. E. (2011). *What are we missing by classifying research participants into standard racial/ethnic categories?* Poster presented at the annual convention of the Western Psychological Association, Los Angeles, CA.

Logan, D. E., & Koo, K. H. (2011). *Perceived risks of alcohol use: predictors and correlates of student perceptions*. Poster presented at the annual convention of the Western Psychological Association, Los Angeles, CA.

Collins, S. E., **Logan, D. E.**, & Neighbors, C. (2009). *Longitudinal predictive effects of readiness to change on alcohol-related variables among heavy drinking college students.* Poster presented at the annual meeting of the Association for Behavioral and Cognitive Therapies, New York, NY.

Kilmer, J. R., **Logan, D. E.**, & Lewis, M. A. (2009). *A, B, C, or D? Performance on a test of alcohol knowledge and the relationship to college student substance use.* Poster presented at the annual meeting of the Association for Behavioral and Cognitive Therapies, New York, NY.

Lewis, M. A., Kaysen, D. L., Kilmer, J. R., Rees, M., & **Logan, D. E.** (2009). *Drinking Protective Behavioral Strategies in Relation to Sex-related Alcohol Negative Consequences.* Poster presented at the annual meeting of the Association for Behavioral and Cognitive Therapies, New York, NY.

Logan, D. E., King, K. M., Kilmer, J. R., & Lewis, M. A. (2009). *"Don't Tell Me What I Can't Do!" Factors affecting alcohol policy reactions in a college setting.* Poster presented at the annual meeting of the Association for Behavioral and Cognitive Therapies, New York, NY.

Hodge, K., Kilmer, J. R., & **Logan, D. E.** (2009). *On- or Off-Campus Residence, Substance Use, and Risky Behaviors.* Poster presented at the annual convention of the Western Psychological Association, Portland, OR.

Logan, D. E. & Lewis, M. A. (2009). *The Impact of Alcohol Protective Behavioral Strategies on Sexual Perceptions and Behaviors in College Students*. Poster presented at the annual convention of the Western Psychological Association, Portland, OR.

Logan, D. E., Koo, K. H., & Kilmer, J. R. (2008). *Beer Pong, Anyone? Factors Associated with College Drinking Games.* Poster presented at the annual convention of the American Psychological Association, Boston, MA.

Koo, K. H., **Logan, D. E.,** & Kilmer, J. R. (2008). *Examining gender: Drinking and alcohol-related negative sexual consequences.* Poster presented at the annual convention of the American Psychological Association, Boston, MA.

Logan, D. E. & Kilmer, J. R. (2008). *Campus Substance Use Policies: Predictors and Correlates of Student Perspectives.* Poster presented at the annual convention of the Western Psychological Association, Irvine, CA.

Logan, D. E. (2007). *Mindfulness, motives, and college student drinking.* Poster presented at the annual convention of the Association for Behavioral and Cognitive Therapies in the Addictive Behaviors Special Interest Group, Philadelphia, PA.

Logan, D. E. (2007). *Character virtues and college student drinking.* Presentation at the annual Research Festival, University of Washington, Seattle, WA.

Logan, D. E. (2007). *Character strengths, high risk drinking and consequences for college students.* Poster presented at the annual convention of the Western Psychological Association, Vancouver, BC.

Logan, D. E. & Hurst, M. A. (2005). *Character strengths and self-esteem in a collaborative learning environment.* Poster presented at the annual convention of the Western Psychological Association, Portland, OR.

TEACHING/MENTORING EXPERIENCE

2011 *Teaching Assistant – Assessment of Intelligence (PSYCH 576)*
University of Washington, 5 credit graduate course, Spring quarter
Teaching Assistant – Practicum in Psychological Assessment (PSYCH 590)
University of Washington, 2 credit graduate practicum, Spring quarter

2009 *Instructor – Introduction to Clinical Psychology (PSYCH 489)*
University of Washington, 3 credit undergraduate course, Spring quarter
Invited speaker – Positive Psychology: What is it and how might it contribute to healing?
Optimizing Health Interest Group, Group Health Cooperative
Invited speaker – Interventions that Work – BASICS and College Students
Addictive Behaviors Seminar, University of Washington
Invited speaker – Psychological Testing; Rational Emotive Behavior Therapy
Introduction to Clinical Psychology, University of Washington

2006-2011 *Invited speaker – Graduate School Preparation*
The Evergreen State College "So You Want to Be a Psychologist" Course

2008-2010 *Co-Trainer – Motivational Interviewing and Alcohol Interventions*
University of Tennessee Knoxville, Facilitator training

2006-2007 *Guest Lecturer – Alcohol and Drugs*
University of Washington Housing and Food Services Resident Advisor Course

2005-2010 *Supervision of Undergraduate and Volunteer Research Assistants*
Direct supervision of undergraduate research assistants

CLINICAL EXPERIENCE

2006-2011 *Individual Therapist,* Psychological Services and Training Center, University of Washington, 1-2 hrs/wk.

2008-2011 *Sanction Group Provider,* Group Interventions with Mandated Undergraduates, The Evergreen State College, 2 hrs/wk.

2010-2011 *Clinical Supervisor,* Project AIMS Alcohol Interventions for Mandated Students, University of Washington and University of Tennessee Knoxville, 1-2 hrs/wk.

2009-2010 *Intervention provider*, iCHAMP Brief Individual Marijuana Interventions, University of Washington and The Evergreen State College, 1-2 hrs/wk.

2009-2010 *Clinical Supervisor,* Psychological Services and Training Center, University of Washington, 1-2 hrs/wk.

2008-2009 *Mental Health Counselor*, The Evergreen State College Counseling Center, Olympia, WA, 12 hrs/wk.

2007-2008 *Group Co-therapist,* Inpatient Psychiatric Process Group, Providence St. Peter Hospital, Olympia, WA, 10 hrs/wk.

2007-2008 *Group Co-therapist,* Adult Process Group, Psychological Services and Training Center, University of Washington, 2 hrs/wk.

2005-2007 *Alcohol and Drug Education Coordinator,* Individual and Group Interventions with Mandated Undergraduates, University of Washington, 20 hrs/wk.

SERVICE

2010 Reviewer for *ETR Associates*

2006-present Ad hoc reviewer for:

Journal of Consulting and Clinical Psychology
Psychology of Addictive Behaviors
Addictive Behaviors
Contemporary Drug Problems
Journal of Applied Social Psychology
Harm Reduction Journal
APA book proposals

PROFESSIONAL AFFILIATIONS

Student Advisory Committee, University of Washington, Department of Psychology
Student Affiliate, American Psychological Association (APA)
Student Affiliate, Association for Behavioral and Cognitive Therapies (ABCT)
Student Affiliate, Research Society on Alcoholism (RSA)
Student Affiliate, Society for a Science of Clinical Psychology (SSCP)
Student Representative, Western Psychological Association (WPA)
Student Representative, American Psychological Association of Graduate Students (APAGS)