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Response of Heavy-drinking Voluntary and Mandated College Students to a Peer-led Brief Motivational Intervention Addressing Alcohol Use

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Abstract

Little is known about the way in which mandated and heavy-drinking voluntary students comparatively respond to peer-led brief motivational interventions (BMIs) and the mediators and moderators of intervention effects. Research suggests mandated students may be more defensive due to their involvement in treatment against their will and this defensiveness, in turn, may relate to treatment outcome. Furthermore, it is not clear how mandated and heavy-drinking voluntary students perceived satisfaction with peer-led BMIs relates to treatment outcomes. Using data from two separate randomized controlled trials, heavy drinking college students (heavy-drinking voluntary, N= 156; mandated, N = 82) completed a peer-led Brief Motivational Intervention (BMI). Both mandated and heavy-drinking volunteer students significantly reduced drinking behaviors at 3-month follow-up, reported high levels of post-intervention session satisfaction, yet no effects for mediation or moderation were found. Findings offer continued support for using peer counselors to deliver BMIs; however, results regarding the mechanisms of change were in contrast to previous findings. Implications for treatment and future areas of research are discussed.

Keywords

College students; alcohol; peer counselors; brief intervention

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1. Introduction

Concerns over high-risk student drinking and related negative consequences continue to grow (Baer & Peterson, 2002; Ham & Hope, 2003; Mitka, 2009) while various prevention and intervention efforts have been tested and adopted by universities (Larimer & Crouce, 2002, 2007). One common intervention approach is use of brief motivational interventions (BMI), and a common BMI format used with college students is the Brief Alcohol Screening and Intervention for College Students (BASICS; Dimeff, Baer, Kivlahan, & Marlatt, 1999). BASICS employs individualized personal feedback to enhance students' motivations to change high risk drinking behaviors, with the ultimate goal of reducing alcohol related consequences. BASICS has been modified to a more brief approach where counselors (professional or peer) meet for one 50-minute session with college students. Efficacy studies have shown that BASICS, when delivered by professional counselors (minimal training of a Master's degree), have been found to reduce drinking and/or consequence among both voluntary (Larimer et al., 2001; Marlatt et al., 1998) and mandated (or adjudicated) college students (Barnett, Murphy, Colby, & Monti, 2007; Borsari & Carey, 2005; Carey, Carey, Maisto, & Henson, 2006; White, Mun, Pugh, & Morgan, 2007).

To date, the use of peer counselors in reducing drinking with college students has not received as much attention. This is unfortunate, as peer counselors have been integrated into prevention and intervention approaches in the effort to find effective, yet inexpensive methods to reduce drinking in college students (Mastroleo, Mallett, Ray, & Turrisi, 2008). Ender and Newton (2000) identified peer counselors as having the capacity to be as, or more, effective than professionals at delivering some services. Fromme and Corbin (2004) and Bergin-Cico (2000) noted students relate better to peers than to older adults, peer-delivered programs have a stronger influence on students' attitudes and behavior, and using upper class students to implement substance use programs may be effective for first-year students. Overall, these factors lend support for the effectiveness of peer based programs creating behavior change in college students (Astin, 1997; D'Andrea & Salovey, 1996).

A small body of research supports the use of individual peer-led brief alcohol interventions with voluntary college students (Larimer et al., 2001; Mastroleo, Turrisi, Carney, Ray, & Larimer, 2010; Turrisi et al., 2009). In the first study to test individually based peer interventions, Larimer and colleagues (2001) tested the effects of BASICS delivered by peer and professional counselors with first-year members of Greek social organizations. Not only did fraternity members receiving BASICS decrease their drinks per week and estimated peak BAC, but peer providers were found to be at least as effective as professional providers (Larimer et al., 2001). Mastroleo et al. (2010) and Turrisi et al. (2009) tested peer-led BASICS with heavy-drinking voluntary first-year college students. Both studies showed reductions in drinking behavior relative to control conditions; however, Turrisi and colleagues (2009) found peer-led BASICS to be most effective when combined with a parent-based intervention.

Even less is known regarding the efficacy of peer-led BMIs with mandated students. This is of concern, as mandated college students in particular are at a higher risk for negative alcohol-related consequences and heavier typical weekly consumption than other college

students (Barnett & Read, 2005; Fromme & Corbin, 2004). Two constructs have emerged as particularly relevant: defensiveness and session satisfaction. Regarding defensiveness, heavy drinking college students have been found to consider problems with alcohol as less important, are more skeptical of scientific literature on alcohol effects, and are more likely to respond to alcohol-risk information in a defensive way (Leffingwell, Neumann, Leedy, & Babitzke, 2007; Vik, Culbertson, & Sellers, 2000). Likewise, students who receive an alcohol violation understandably respond with defensiveness when risking penalties or punishment (Sharkin, 2007), and perceived external pressure to change as a result of being mandated could produce increased defensiveness (Zonana & Norko, 1993). As such, mandated students that are resistant and defensive may have worse outcomes. For example, Palmer et al. (2010) compared treatment effects of a two-session group-based Alcohol Skills Training Program with a sample of voluntary and mandated students. Compared to the voluntary group at baseline, the mandated group reported higher defensiveness, with intervention defensiveness moderating intervention efficacy (Palmer et al., 2010).

Likewise, it is plausible that perceived satisfaction with peer-led BMIs (e.g., credibility of the peer counselor, intentions to change drinking) may predict post-session drinking outcomes. Research with adults in substance use treatment indicates participant satisfaction is significantly related to outcome following a brief preventive intervention (Carlson & Gabriel, 2001; Holcomb, Parker, & Leong, 1997; Palmer, 2004; Perreault et al., 2010). For example, Donovan and colleagues (2002) analyzed Project MATCH data and found that greater treatment satisfaction was associated with higher rates of therapy attendance, greater reduction in drinking during therapy, and better clinical status at the end of therapy. The relationship between satisfaction with treatment and clinical outcome has yet to be explored systematically with heavy-drinking voluntary or mandated college students.

Given the prior research supporting the efficacy of peer-led BMI and the common use of the intervention approach in practice on U.S. college campuses (Mastroleo et al., 2008), it would be important to compare how heavy-drinking voluntary and mandated students perceive their peer counselors. The current study utilized data from two independent trials to evaluate four hypotheses regarding the efficacy of peer-led BMIs with heavy-drinking voluntary and mandated college students. First, we hypothesized that a peer-led BMI would produce similar reductions in alcohol use outcomes at 3-month follow-up for both mandated and heavy-drinking voluntary students. Second, we hypothesized that mandated students would score higher at baseline on defensiveness than heavy-drinking voluntary students. Furthermore, we predicted that there would be no differences on post-intervention peer counselor credibility or intention to change drinking between heavy-drinking voluntary and mandated students. Third, we predicted that defensiveness would moderate intervention effects: Students with higher levels of defensiveness would be associated with higher drinking outcomes post-intervention. Finally, we hypothesized that post-intervention peer counselor credibility and intention to change drinking ratings would mediate intervention effects: Peer counselor credibility and intention to change drinking are mechanisms by which the intervention impacts drinking outcomes and alcohol-related problems.

2. Materials and Methods

The current study combined data from two independent studies examining the efficacy of a peer-led BMI with high-risk college students. In study 1, participants were students mandated to a BMI following a campus alcohol policy violation. Study 2 participants were heavy-drinking voluntary students recruited from the overall first-year student population as they transitioned to college. The current study focused on baseline assessments prior to randomization and intervention procedures, post-intervention satisfaction assessments conducted immediately following BMI completion, and 3-month follow-up assessments. Each study was approved by their institutions' Institutional Review Board, was in compliance with APA ethical guidelines, and participants completed an informed consent form before participating in the study.

2.1. Study 1

Study 1 evaluated the efficacy and training of peer counselors in a peer-led BMI with college students mandated to treatment following an alcohol policy violation (Mastroleo, Magill, Barnett, & Borsari, in press). Mandated students were invited to participate in the study upon arrival to the Office of Health Promotion and Education (OHPE) between September 2009 and February 2010 at a four-year, private liberal arts university located in the Northeast. Upon signing the informed consent form, participants were given an introductory letter, which included a web-link, a personalized identification number, and information describing how to access the web-based survey. Students were randomized to complete a peer-led BMI within one of two peer counselor training conditions (group supervision vs. group + individual supervision). Participants ($N = 82$) were undergraduate students who violated campus alcohol policy. Campus policy at this university dictates that first-time offenders are fined \$50 and mandated to complete an alcohol intervention. Eighty-two of 123 students (67%), age 18 years and older, agreed to participate and provided informed consent. Students who declined participation received treatment as usual, which consisted of a peer-led BMI session, but no follow-up assessments. Participants completed a 45-minute baseline assessment prior to receiving the peer-led BMI and were not paid for their baseline assessment. Of those who were recruited to participate in the study, 82 of 82 (100%) completed baseline and the BMI. Follow-up assessments were conducted at 6-weeks and 3-months post-intervention with completion rates of 71% and 72%, respectively. Participants were paid \$15 for the 6-week and \$20 for the 3-month follow-up assessments. All 82 participants completed the session satisfaction surveys post-intervention. Participants ($n = 82$) were primarily male (79.3%) and White (90.2%). Mean age for the sample was 19.39 years ($SD = 1.28$; See Table 1). The sample demographics mirror the overall campus population, with the exception of gender. As is common in mandated samples, a higher proportion of male students compared to female students were referred to the OHPE for a campus alcohol violation. No significant differences were found on drinking outcomes between supervision conditions (Mastroleo et al., in press), as such, treatment groups were combined to create a single sample of mandated students for the current study.

2.2. Study 2

Study 2 examined the efficacy of a brief, peer-led alcohol intervention on drinking behaviors of first-year students as they transition to college (Mastroleo et al., 2010). First semester, first-year students ($N = 947$) were randomly selected through the university database of student information at a large, rural, public Northeastern university. Potential participants were mailed an introductory letter inviting their participation during the first week of the Fall 2007 academic semester, which included a web-link, a personalized identification number, and information describing how to access the informed consent form and web-based survey. A total of 481 undergraduate students (50.7%) logged into the survey, completed baseline measures within two weeks of their first semester of classes, and were screened for heavy drinking. Students were paid \$20 for completing the survey. Inclusion criteria for longitudinal participation included age (18-20 years) and heavy episodic drinking. Students in this study were identified as high-risk drinkers after identifying at least one heavy drinking episode (4 drinks for women, 5 drinks for men in a 2 hour period of time) within the past two weeks. Following baseline assessment and identifying longitudinal study inclusion (past 2 weeks heavy episodic drinking behavior), participants were randomized to either complete a peer-led BMI within one of two peer counselor training conditions (no supervision vs. individual supervision) or to an assessment-only control condition ($n = 238$). For the current study, only participants randomized to complete a BMI were included ($n = 156$). Of those randomized to complete a BMI, 61 (39%) completed the BMI, post-intervention follow-up measures, and were paid \$10. One follow-up assessment was conducted at 3-months post-intervention with an 84% follow-up rate, for which participants were paid \$20. Participants were primarily female (52.3%) and White (88.7%), with a mean age of 18.12 ($SD = .41$) years. Results indicated students completing the peer-led BMI significantly reduced drinking at 3-month follow-up when compared to the Assessment-only Control condition, however no significant differences were found between treatment groups (Mastroleo et al., 2010). Therefore, treatment groups were combined to create a single sample of heavy-drinking voluntary students.

2.3. BMI

The peer-led BMI was based on BASICS, which is a manualized intervention built on state-of-the-art empirically validated prevention and treatment approaches for alcohol related problems tailored to the specific needs of young college students. BASICS incorporates Motivational Interviewing (MI) principles described by Miller and Rollnick (2002) with the use of personalized feedback, discussion about participants' alcohol use and related risky behaviors, and assistance for willing participants to establish a change plan. Reduced alcohol use and alcohol-related harm and consequences were the target of behavior change in both studies. BASICS, a Tier I intervention approach (National Institute on Alcohol Abuse and Alcoholism, 2002) and Substance Abuse and Mental Health Services Administration (SAMHSA) model program (SAMHSA, 2008), has been the focus of over 40 RCT's identifying efficacy when professionally delivered (Carey et al., 2006; Larimer & Cronce, 2002, 2007).

2.4. Peer Counselor Selection and Training

2.4.1. Peer counselor selection—Peer counselors for Study 1 were identified through the Office of Health Promotion and Education after being selected by the Director of the office to serve as a Health and Wellness Educator (HAWE) for the academic year. HAWE's were invited to participate in the research study during the University's pre-orientation training, at which point 100% (12 total) agreed to participate and signed a consent form for inclusion in the study. Study 1 peer counselors were primarily female ($n = 10$), and White ($n = 11$) with one identifying as Asian and had a mean age of 19.7 ($SD = 0.5$). Peer counselors had no prior MI training or experience.

Undergraduate peer counselors for Study 2 were recruited through class announcements in various introductory psychology, biobehavioral health, and human development classes. Potential peer counselors were interviewed initially in a group meeting, followed by individual interviews to assess interest level, basic interpersonal skills, and appropriateness for conducting alcohol interventions with fellow undergraduate students (Mastroleo et al., 2010). Of 49 applicants interviewed, 20 were selected to be trained as peer counselors. Nineteen individuals accepted positions and were randomly assigned to one of two training groups for which they received course credit. Peer counselors had a mean age of 20.7 ($SD = 1.17$) and were primarily White ($n = 17$) with one identifying as African American and one identifying as multiracial.

2.4.2. Peer counselor training—For both studies, training was conducted using a 2-day (12 hours total) protocol prior to the start of the fall semester. The training workshop consisted of a review of the BMI manual and videotaped examples of BMIs, MI skill practice exercises, and review of the individual graphic feedback information used in each session. Specific training components included an overview of MI, information on reflective listening skills, use of open- and closed-ended questions, change talk facilitation, rapport building strategies, and ways of dealing with resistant students. Using the personalized normative feedback handout as a guide, peer counselors were instructed on specific alcohol information related to BAC levels, alcohol outcome expectancies, college normative beliefs, protective behaviors, family history, and other general alcohol information as described in the BMI manual (Dimeff et al., 1999). Following the initial training, each peer counselor conducted two audio recorded BMI role plays. Training and supervision sessions were conducted by the first author.

2.4.3. Peer counselor supervision—For half of each peer counselor training group in Studies 1 and 2, initial supervision consisted of one hour of individual feedback on peer counselors' BMI role-plays, during which motivational interviewing skill acquisition and enhancement was discussed through review of the audio-recorded role-play sessions. Supervision sessions occurred prior to peer counselors conducting sessions with study participants. Using the Peer Proficiency Assessment (PEPA; Mastroleo et al., 2008) as a guide for identifying MI microskills, ways in which peer counselors could improve MI consistent behaviors (e.g., complex reflections) while reducing MI inconsistent behaviors (e.g., closed-ended questions) were discussed. For peer counselors in Study 1, once implementation of BMIs was initiated, members of the supervision group ($n = 6$) continued

in weekly individual supervision (1 hour) while all peer counselors (n = 12) participated in weekly group supervision (30-45 minutes). Group supervision was focused on general issues with clients and implementation of BMIs compared to individual supervision, which focused on peer counselors MI skills development. In Study 2, once peer counselors began completing interventions with participants, one half of peer counselors (n = 10) continued in weekly individual (1 hour) and group (1 hour) supervision. The remaining peer counselors (n = 9) received no individual or group supervision throughout the study. The first author conducted both individual and group supervision meetings.

2.5. Measures

2.5.1. Alcohol Outcomes—All alcohol questions were operationalized using the definition of a standard drink (i.e., 12 oz. beer, 4 oz. wine, 1 oz. distilled liquor).

2.5.1.1. Daily Drinking Questionnaire: (DDQ; Collins, Parks, & Marlatt, 1985). Drinking rates were evaluated using a modified version of the DDQ. Participants reported their typical drinking on each day of the week, averaged over the last three months. The weekly sum of typical daily drinking over the past month was chosen to reflect typical drinking patterns.

2.5.1.2. Quantity/frequency/peak index: (QF; Dimeff et al., 1999). Participants reported their typical drinking frequency, quantity, and the single greatest amount (peak) of alcohol consumption, and hours spent drinking during the past month. A computerized algorithm (ratio of milligrams of alcohol per 100 milliliters of blood reported as a percentage) was used to produce estimations of peak blood alcohol levels (eBAC) based upon the quantity and rate of consumption, body weight, and biological sex.

2.5.1.3. Heavy drinking: Heavy drinking was assessed with four items. First, students were asked, “During the past 30 days (about 1 month), how many times have you gotten drunk, or very high from alcohol?” (Collins et al., 1985). Response options ranged from “Never” to “more than 9 times” on a 6-point scale. Second, students were asked, “Think back over the last two weeks. How many times have you had 5 or more drinks (4 for women) in a row within two hours?” Third, students were asked, “Think of the occasion when you drank the most in the past month. How much did you drink?” Finally, using items from the DDQ (Collins et al., 1985), participants were asked the number of drinks consumed on a typical Friday and Saturday. These items were summed to create a weekend drinking index. The latter three questions allowed for open-ended responses and participants responded by writing in a number that reflected their answers. Items were standardized using z-scores and combined to create one index of heavy drinking at baseline ($\alpha = .74$) and follow-up ($\alpha = .78$).

2.5.1.4. Rutgers Alcohol Problem Index: (RAPI; White & Labouvie, 1989). The RAPI was used to assess alcohol-related consequences. The RAPI consists of 23-items and assesses the role alcohol plays in social, academic, and personal functioning over the past year. Examples of items include, “How many times, while you were drinking, were you unable to do your homework or study for a test” and “went to work drunk or high?” Response options were: “Never,” “1-2 times,” “3-5 times,” “6-10 times,” and “more than 10

times.” The RAPI has demonstrated good internal validity in previous research examining college student alcohol use and associated negative consequences (e.g., Barnett et al., 2007; Larimer et al., 2001; Mastroleo et al., 2010). For the current study, Cronbach alphas were $\alpha = .83$ and $\alpha = .88$ at baseline and follow-up, respectively.

2.5.2. Moderator Variable

2.5.2.1. Defensiveness: The Intervention Defensiveness Measure assesses defensiveness with an 11-item Likert type scale (Palmer, 2004). At baseline, participants were asked to rate statements such as: “I am generally interested in the BASICS session”, “Attending the BASICS session will be a waste of my time”, and “I am interested in knowing more about my drinking.” Items are rated from 1 (strongly disagree) to 7 (strongly agree). The scale has very good internal reliability ($\alpha = .86$). In the present study, items were combined to create a single index of defensiveness ($\alpha = .76$).

2.5.3. Mediator Variables (Participant Satisfaction Survey; Palmer, 2004)—

2.5.3.1. Peer counselor credibility was assessed immediately following the BMI. Twelve items were rated on a 7-point-scale where 1 = Strongly Disagree to 7 = Strongly Agree with higher scores indicating greater counselor credibility. This index was created from four items (e.g., the feedback interview peer counselor seemed well-organized, the feedback interview peer counselors seemed warm and understanding; $\alpha = .87$).

2.5.3.2. Intention to change drinking was constructed with three items (e.g., upon completing the feedback interview, I have developed a goal to change my drinking habits, I feel better able to deal with alcohol related situations; $\alpha = .87$). Items were rated on a 7-point-scale where 1 = Strongly Disagree to 7 = Strongly Agree. Items were then summed, with higher scores indicating a greater intention to change drinking.

2.6. Analysis Plan

All outliers for weekend drinking ($n = 3$), peak drinks ($n = 4$), BAC ($n = 6$), daily drinking ($n = 4$), and alcohol-related consequences ($n = 8$) greater than three standard deviations from the mean were re-coded to one value greater than the farthest non-far outlier (Fidell & Tabachnick, 2003). Analysis of Variance (ANOVA) was used to examine baseline and post-intervention drinking, pre-intervention defensiveness, post-intervention peer counselor credibility, and intention to change drinking between the two samples. Finally, a series of regression analyses were conducted to examine the roles of pre-intervention defensiveness as moderators and post-intervention peer counselor credibility and intention to change drinking as mediators of drinking outcomes.

To examine the role of defensiveness as a moderator, a series of regression analyses were conducted on each of the 5 outcome variables. For each regression, outcome variables measured at the 3-month follow-up were used as the dependent variable. Regression analyses examined the effect of defensiveness among mandated and heavy-drinking voluntary students on number of standard drinks consumed in a typical drinking week, alcohol related consequences (measured by the RAPI), heavy episodic/binge drinking, weekend drinking (sum drinks of Friday and Saturday), and eBAC. In the first step, we

entered the baseline score to evaluate time effects, controlling for regression to the mean as well as a centered defensiveness score. In the second step, group differences were evaluated by entering a dummy-coded variable (Mandated Student vs. Heavy-drinking voluntary Student). Finally, an interaction variable (Student Status [mandated vs. heavy-drinking voluntary] X Centered Defensiveness Scores) was added in a third step to see if it significantly improved model fit.

To examine the two indices of session satisfaction as mediators, we examined a multiple mediator model following the approach by Preacher and Hayes (2008). We first tested the treatment to mediator (*a*) and mediator to outcome (*b*) paths. Specifically, treatment condition (mandated vs. heavy-drinking voluntary) to the candidate mediator (post-intervention peer counselor credibility and intention to change drinking) and the candidate mediator to the outcome variables (total drinks per week, alcohol related consequences [RAPI], heavy drinking, weekend drinking, and eBAC) were tested in covariate adjusted individual regression models across 3-month follow-up. Regression models were run with the baseline value of the dependent variable included as covariates.

3. Results

3.1. Baseline Drinking

Demographic information and baseline alcohol use and consequences for the two samples are provided in Table 1. Mandated students were more likely to be male than heavy-drinking voluntary students. In addition, heavy-drinking voluntary students reported more heavy episodic drinking and mandated students reported more drinks on a peak occasion than heavy-drinking voluntary students. No other significant differences between mandated and heavy-drinking voluntary students were found.

3.2. Post-intervention Changes in Drinking Behaviors

Analysis of co-variance was used to evaluate mean differences in drinking behaviors at follow-up by treatment group (mandated vs. heavy-drinking voluntary students), controlling for baseline alcohol use. As can be seen in table 2, students who received a BMI, regardless of being heavy-drinking voluntary or mandated students, significantly reduced drinking behaviors (e.g., drinks per week, peak eBAC; $p < .05$) at follow-up. When comparing heavy-drinking voluntary and mandated students, only eBAC showed significant treatment effects between groups with mandated students showing larger reductions at 3-month follow-up than heavy-drinking voluntary students ($F(1, 180) = 5.90, p = .02$).

3.3. Defensiveness, Peer Counselor Credibility, and Intention to Change Drinking

For pre-intervention defensiveness, ANOVA revealed no significant difference between heavy-drinking voluntary and mandated groups meaning both student groups entered the BMI with similar levels of defensiveness. Regarding post-session ratings, analyses revealed no significant differences on post-intervention peer counselor credibility drinking between mandated and heavy-drinking voluntary students (all p 's $> .05$). Finally, interventions resulted in similar intentions to change drinking immediately post-intervention. See Table 1 for results.

3.4. Pre-intervention Defensiveness as a Moderator

Examination of defensiveness as a moderator of BASICS efficacy revealed no moderating effects on any of the five dependent variables (i.e., total drinks per week, alcohol related consequences [RAPI], heavy drinking, weekend drinking, and eBAC). Specifically, examination revealed no significant group differences for participants at low and high levels of pre-intervention defensiveness (all p 's > .05).

3.5. Post-intervention Intention to Change and Peer Counselor Credibility as Mediators

Our mediation hypotheses were not supported since no significant mediating effects were observed for the indices of post-intervention intention to change drinking or peer counselor credibility (see Table 3). Both heavy-drinking voluntary and mandated students reported moderate levels of intention to change alcohol use ($M = 13$ and 12 , respectively) and high levels of perceived credibility of the counselor ($M = 26.4$ and 26.1 , respectively) after completing the BMI with a peer counselor. However, the constructs were not a significant mediator of group (mandated vs. heavy-drinking voluntary) and drinking outcomes (i.e., total drinks per week, alcohol related consequences [RAPI], heavy drinking, weekend drinking, and eBAC). For mediation results see Table 3.

4. Discussion

This is the first study to compare a peer-led BMI with heavy-drinking voluntary and mandated college samples at two different sites. Several findings of interest emerged. Namely, both mandated and heavy-drinking voluntary students reduced alcohol use following a peer-led BMI and reported similar perceived peer counselor credibility and intentions to change drinking following the intervention. Together, these results lend continued support for peer-led BMIs as a successful intervention approach (Mastroleo et al., 2008). That said examination of possible moderators or mediators of peer-led BMIs led to some unexpected findings: Defensiveness did not emerge as a moderator of treatment effects, nor did intentions to change drinking or peer counselor credibility mediate the observed reductions in alcohol use and problems. The possible explanations for the observed results highlight the need for a more thorough understanding of how satisfaction and defensiveness experienced by heavy-drinking voluntary and mandated participants may qualify BMI effects on drinking.

As hypothesized, we did not find consistent differences on drinking outcomes between heavy-drinking voluntary and mandated students. In contrast, both groups appeared to reduce their alcohol use following a BMI. We acknowledge variations in campus norms and populations may have played a role in these differences. However, the differences may also be related to the mandated sanction. Research exploring the within-session processes of peer-led BMIs may offer insight into the way in which interventions influence reductions in eBAC for both heavy-drinking voluntary and mandated students.

Contrary to our hypothesis, we found heavy-drinking voluntary and mandated students did not differ overall on pre-session defensiveness. This is also a divergence from past studies which found mandated students report higher levels of defensiveness than heavy-drinking

voluntary students (Palmer et al., 2010) and heavy drinkers consider their problem with alcohol as less important and are more skeptical of scientific literature on alcohol effects (Leffingwell et al., 2007; Vik et al., 2000). Thus, research examining specific areas of defensiveness may lead to a greater understanding of the nature of their defensiveness. It may be that students do not think it is necessary to think about how much they drink; past research has explored clusters of mandated student drinkers falling into one of three categories (So What?, Why Me?, Bad Incident; Barnett et al., 2008). Specifically, the “So What?” cluster which is characterized by high heavy drinking and alcohol-related problems, moderate incident drinking and responsibility. Furthermore, students with low aversiveness to the referral incident may be more defensive and less interested in changing their drinking. Exploring these categories of mandated students and their related levels of defensiveness may identify focused areas for training peer counselors for implementation of BMIs. Similar construct clusters may be identified within heavy-drinking voluntary students, which may help tailor intervention approaches.

Defensiveness also did not moderate the efficacy of the BMIs. This was in contrast to research with mandated students indicating that greater defensiveness was correlated with increased drinking and consequences following a BMI (Logan, Kilmer, King, & Larimer, under review). Findings in the current study may be due to peer counselor’s abilities to work with the student in a collaborative manner as they were instructed through the motivational interview training protocol. It may also be that although students enter the session with some level of defensiveness, prior knowledge of plans to work with a fellow undergraduate student as a peer counselor may attenuate these initial feelings, thus eliminating the impact on drinking outcomes. Also important to note, defensiveness scores were in the moderate range for both heavy-drinking voluntary and mandated samples in the current study, which was somewhat lower than other studies where professionals delivered BMIs (e.g., Logan et al., under review; Palmer et al., 2010). As such, the comparison of how peers and professionals may work with a more defensive client remains unclear. Future research focused on within-session processes may help elucidate important information about ways in which counselors, both peer and professional, can more successfully work with highly defensive students.

Finally, peer counselor credibility and student intention to change drinking did not mediate drinking outcomes. A closer examination of peer counselor credibility scores suggests some reasons for this lack of mediation. Namely, the majority of students viewed the session positively and felt their peer counselor was warm and understanding, competent and well trained, knowledgeable about alcohol use, and well organized. As is often found in general psychotherapy literature, the nature of the relationship between the counselor and client has a strong role in influencing clients’ perceptions of their satisfaction with counseling (Horvath & Greenberg, 1989), yet this satisfaction does not always result in behavior change. The combination of overall high peer counselor credibility scores and general reductions in drinking may be associated, but in the current study no support for this construct as a mediator was found. The role peer counselors play is important to explore as the nature of the peer relationship may have implications for longer term drinking and consequence reductions, but has yet to be tested. Future studies may consider examining variations in therapists and intervention providers to gain a clearer understanding of the way

in which session satisfaction works under varying circumstances. In contrast, past studies have found an intention to change drinking mediates post-intervention drinking outcomes (Barnett, Goldstein, Murphy, Colby, & Monti, 2006; Neal & Carey, 2004). The reason for lack of mediation in the current study is unclear, however it may be that other untested mediators would explain some of the drinking outcome changes. Changes in normative beliefs have been consistently tied to post-intervention drinking outcomes (see Larimer & Cronce, 2002, 2007), so it is possible that other constructs would more clearly explain the drinking reductions with the current sample.

4.1. Limitations

Although study findings showed continued support for the use of BMIs with peer counselors, it is important to note several study limitations. Most importantly, two separate samples of students were used from different campuses and participants experienced a different set of peer counselors. Therefore, direct comparisons of how heavy-drinking voluntary and mandated students respond to peer counselors cannot be made. Specifically, methodological and specific clinician effects may be driving findings. Nonetheless, given the similarities of the participants from Study 1 and Study 2, and research identifying consistencies among college student samples nationally (American College Health Association, 2012; Astin, 1997), we believe the findings offer preliminary support for the way in which mandated and heavy-drinking voluntary students respond to peer counselor led BMIs. Although there was no statistically significant difference in age between the two samples, the mandated sample did have a higher mean age (19.1) which may have impacted their responses to peer counselors, the BMI, and drinking outcomes. As research suggests students mature out of heavy drinking, this may have a role in the reductions of the student drinking outcomes with the mandated sample. Another limitation of this study is that it relied on student self-report of alcohol use. To limit concerns over the use of self-report, participants were assured of confidentiality through statements throughout the survey and consent form and individuals responded via a web-based survey rather than an in-person interview. Furthermore, a recent meta-analysis found no evidence of under-reporting alcohol use in college student samples (Borsari & Muellerleile, 2009). We also acknowledge a small and relatively homogenous sample, which may reduce generalizability of the results.

4.2. Implications for Treatment

Results of the current study suggest several important treatment and policy implications. Most essential, the BMI sessions led by peers resulted in significant decreases in alcohol use for both the mandated and heavy-drinking voluntary students. Additionally, both groups were satisfied with the session. The effectiveness of peers with both populations suggests university providers might consider the use of peer delivered interventions as part of their services to students. This might be cost effective, while also promoting a sense of community and give advanced university students the opportunity to learn valuable clinical skills. What remains unknown is whether students would be more inclined to participate in BMIs and alcohol reduction programs if they are peer delivered. This is an important empirical question as a peer approach may improve and extend access to high-risk populations at both prevention and intervention levels.

Finally, it should be noted that despite the drinking reductions observed, both groups continued to exhibit risky alcohol use. Put in a chronological perspective, these findings suggest that first-semester students who endorse heavy alcohol use may indeed be the same students who are later mandated to treatment following a campus alcohol violation. If this is the case, BMIs for heavy-drinking voluntary students may work to prevent sanctions for later alcohol use. Although, the current sample of heavy-drinking voluntary students only used a 3-month follow-up, no students endorsed an alcohol related sanction, suggesting the BMI may have a preventative effect on campus alcohol sanctions over an extended period of time. This preventative effect has been observed in other research (e.g., Borsari et al., 2012). That said, as high-risk drinking can result in increased consequences, including mandated treatment for violations, longer term follow-ups identifying the way in which BMIs may help prevent these outcomes is needed.

4.3. Conclusion

This study extends the research on mandated and heavy-drinking voluntary student's comparative response to a BMI and is the first to explore potential differences in the context of using peer interventionists. Heavy-drinking voluntary and mandated students were generally alike in their baseline drinking and response to the BMI, while also similarly identifying overall support for this low cost intervention approach. Past studies examining the efficacy of peer-led BMIs has offered support for the approach working well with heavy-drinking voluntary college students, yet similar research exploring the appropriateness of a peer-led mandated BMI had yet to be completed. The similar responses of both student groups is an important contribution to prevention and intervention literature due to concern over alcohol consumption on college campuses and the economic challenges administrators face. The refined and informed use of peer interventionists to deliver BMIs may prove to be a viable treatment option.

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Table 1
Descriptive Statistics at Baseline by Group

Variable	Sample Summary N(% or SD)	Mandated n=82 Mean (SD)	Heavy- Drinking Voluntary n=156 Mean (SD)	F/ χ^2	p
Gender					
Male	146 (61.9)	65 (79.3)	81 (51.9)	16.13	<.001
Female	90 (38.1)	17 (20.7)	75 (48.1)		
Race					
White	217 (91.9)		145 (92.9)	12.69	.05
American Indian/Alaskan Native	3 (1.3)	3 (3.7)	0		
Asian	5 (2.1)	0	5 (3.2)		
Black/African American	3 (1.3)	2 (2.4)	1 (0.6)		
Multiracial	5 (2.1)	2 (2.4)	3 (1.9)		
Other	3 (1.3)	1 (1.2)	2 (1.3)		
Ethnicity					
Hispanic	9 (3.8)	2 (2.4)	7 (4.5)	0.65	0.34
Non-Hispanic	227 (96.2)	80 (97.6)	149 (95.5)		
<u>Dependent Variables</u>					
Average drinks per week	16.57 (10.73)	18.11 (12.40)	15.75 (9.68)	2.58	0.11
Average eBAC	0.169 (0.09)	0.163 (0.09)	0.173 (0.09)	0.59	0.45
No. HED episodes ^a	3.17 (2.27)	2.41 (2.07)	3.58 (2.28)	15.04	<0.001
No. peak drinks ^a	9.31 (4.58)	10.24 (5.17)	8.81 (4.17)	5.32	0.02
Average Weekend Drinking	12.53 (6.70)	13.55 (7.95)	11.99 (5.89)	2.93	0.09
RAPI total score	5.13 (4.29)	4.65 (5.28)	5.38 (3.67)	1.51	0.22
Defensiveness	45.35 (9.70)	44.32 (8.54)	45.90 (10.26)	1.42	0.23
Intention to Change	12.57 (4.17)	12.25 (4.57)	13.06 (3.46)	1.21	0.27
Peer Counselor Credibility	26.24 (2.40)	26.11 (2.55)	26.46 (2.14)	0.62	0.43

Note: HED=heavy episodic drinking, eBAC= Estimated Blood Alcohol Content RAPI= Rutgers Alcohol Problem Index;

^aPast month

Table 2
Comparisons of Baseline and Follow-up Drinking Outcomes by Group

Variable	Baseline Mean (SD)	3-month Mean (SD)	F	p
Average Drinks per Week				
<i>Heavy-drinking voluntary</i>	15.75 (9.68)	13.70 (9.28)		
<i>Mandated</i>	18.11 (12.40)	14.79 (10.55)	0.48	0.49
No. HED episodes ^a				
<i>Heavy-drinking voluntary</i>	3.58 (2.28)	2.18 (2.03)		
<i>Mandated</i>	2.42 (2.07)	2.13 (2.76)	0.02	0.88
Average Weekend Drinking				
<i>Heavy-drinking voluntary</i>	11.99 (5.89)	10.55 (6.12)		
<i>Mandated</i>	13.55 (7.95)	11.91 (7.84)	1.58	0.21
Average eBAC				
<i>Heavy-drinking voluntary</i>	0.173 (0.09)	0.148 (0.09)		
<i>Mandated</i>	0.163 (0.09)	0.115 (0.07)	5.90	0.02
No. peak drinks ^a				
<i>Heavy-drinking voluntary</i>	8.81 (4.17)	7.90 (4.36)		
<i>Mandated</i>	10.24 (5.17)	8.18 (4.49)	0.16	0.69
RAPI total score				
<i>Heavy-drinking voluntary</i>	5.38 (3.67)	5.28 (4.24)		
<i>Mandated</i>	4.65 (5.28)	4.85 (6.06)	0.29	0.59

Note: HED=heavy episodic drinking, eBAC= Estimated Blood Alcohol Content, RAPI= Rutgers Alcohol Problem Index;

^aPast month

Table 3
Group Effects on Mediators, Mediator Effects on Alcohol Outcomes, Mediated Effects, and Confidence Intervals

Mediator	(a) Group effect on mediator	(b) Mediator effect on outcome	(cβ) Mediated Effect	Lower C.I. of Mediated Effect	Upper C.I. of Mediated Effect	Significance of Mediated Effect P-value
Intention to Change Drinking						
No. HED episodes	-1.52	0.04	-0.07	-0.39	0.03	-0.001 ^{NS}
Average Drinks per Week	-1.20	-0.08	0.08	-0.33	0.75	-0.02 ^{NS}
Average Weekend Drinking	-1.08	-0.08	0.07	-0.15	0.67	-0.02 ^{NS}
Average eBAC	-1.27	0.003	-0.001	-0.009	0.002	-0.000 ^{NS}
RAPI Total Score	-1.52	-0.04	0.03	-0.28	0.69	-0.02 ^{NS}
Counselor Credibility						
No. HED episodes	-0.38	0.05	-0.01	-0.24	0.07	0.007 ^{NS}
Average Drinks per Week	-0.54	0.11	-0.07	-0.93	0.28	-0.005 ^{NS}
Average Weekend Drinking	-0.49	0.06	-0.02	-0.56	0.24	0.004 ^{NS}
Average eBAC	-0.41	0.003	-0.001	-0.01	0.001	-0.000 ^{NS}
RAPI Total Score	-0.43	0.07	-0.02	-0.497	0.12	0.006 ^{NS}

* $p < .05$,

** $p < .01$,

*** $p < .001$ two-tailed; NS= Nonsignificant