

PROVIDING PERSONALIZED FEEDBACK REGARDING ALCOHOL USE  
IN A GROUP FORMAT TO COLLEGE FRESHMEN

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PROVIDING PERSONALIZED FEEDBACK REGARDING ALCOHOL USE  
IN A GROUP FORMAT TO COLLEGE FRESHMEN

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PROVIDING PERSONALIZED FEEDBACK REGARDING ALCOHOL USE IN A  
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DISSERTATION ABSTRACT  
PROVIDING PERSONALIZED FEEDBACK REGARDING ALCOHOL USE  
IN A GROUP FORMAT TO COLLEGE FRESHMEN

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Doctor of Philosophy, August 9<sup>th</sup> 2008  
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College student alcohol use has become an increasing public health concern in recent years. In particular, risky alcohol use behaviors such as binge drinking episodes and methods in which to intervene have become areas of clinical and research interest.

This document reviews the history of college student alcohol use including prevalence and associated negative consequences. Additionally, the development of brief interventions and the application to college student drinkers is described. Specifically, the Brief Alcohol Screening and Intervention for College Students (BASICS) program is reviewed. Research supports the use of such a brief intervention to reduce risky alcohol use patterns among college students. However, research is limited regarding intervening

with college freshmen. More specifically, little is known about how current interventions may be modified to suit this unique college student population.

The BASICS program was modified from a one-on-one intervention to a classroom based intervention. Participants included 185 Auburn University freshmen enrolled in 14 sections of The Auburn Experience (UNIV 1000) course. Participants were randomly assigned by section to receive either a personalized lecture regarding their alcohol use or a generic lecture about alcohol. Participants self-reported their alcohol use patterns at baseline and again at a 5 week follow-up assessment.

The results of this study do not support the use of a classroom based, personalized feedback intervention among college freshmen to reduce the quantity, frequency, or related negative consequences of alcohol use. However, the results indicated some change in students' peer perceptions of alcohol use and their readiness to change their alcohol use patterns from baseline to follow-up. Suggestions for future research are provided.

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## INTRODUCTION

College student substance use has been an area of scientific research for several decades. College student alcohol use, in particular high-risk patterns of alcohol use and its associated consequences, has recently become a matter of public concern. There have been three nationally publicized cases: the University of Colorado, Colorado State University, and University of Maryland (USA Today, January 25, 2006; Boston Globe, November 1, 2004) of alcohol-related student deaths in recent years. Each student's death resulted from the consumption of a large amount of alcohol within a relatively brief period. Research regarding college student alcohol use has offered suggestions to prevent or reduce such tragic events from occurring, including modifications in campus policies and community alcohol marketing strategies (e.g., Wechsler, Lee, Kuo, & Lee, 2000). The National Institute of Alcohol Abuse and Alcoholism (NIAAA) suggested the use of specific intervention techniques (i.e., brief intervention) as an effective method to reduce risky alcohol use behaviors among college students (NIAAA, 2002).

The purpose of this paper is to discuss the prevalence and consequences of college student alcohol use, to review the literature on brief intervention, and address the Brief Alcohol Screening and Intervention for College Students (BASICS; Dimeff, Baer, Kivlahan, & Marlatt, 1999) program. This paper will also review the use of brief interventions for college freshmen, a special population of at-risk college student drinkers (Wechsler et al., 2000; Wechsler, Dowdall, Davenport, & Castillo, 1995). I review the

research regarding prevention and interventions of alcohol-related problems with college freshmen and how existing interventions, such as BASICS, could be adapted and applied to these special populations (e.g., provision of personalized feedback in a group setting). Finally, I discuss an original empirical study that investigated the effectiveness of a classroom-based version of BASICS delivered to a group of college freshmen.

### Prevalence of College Student Alcohol Use

#### *Historical Studies*

Straus and Bacon (1953) published the first comprehensive nationwide report of college student drinking. They conducted their survey of alcohol use among college students as part of a larger study of alcohol-related problems in American society. The study included 27 colleges representative of various types of institutions including public and private, men's and women's, and Caucasian and African American schools. The sample included 15,747 undergraduate students selected from class groups that approximated the total student body with regard to gender, major, and year in college. Forty percent of the sample reportedly consumed alcohol once in the past month.

Corder, Dezelsky, Toohey, and Tow (1974) designated alcohol as the drug of choice among college students. Blane and Hewitt (1977) published a comprehensive review of the literature regarding alcohol use among young people from 1960-1975. They subdivided the population into three segments: up to age 12, ages 13-18 (consisting of high school students and the general population), and ages 18-21. The latter group included college students as well as their same-aged peers. Blane and Hewitt's analysis compared the prevalence (including lifetime, past year, and current use) of alcohol use prior to 1966, from 1966-70, and 1971-75. They found a significant increase in alcohol

use among the college-aged group from before 1966 (71.4%) to 1971-75 (88.5%). The authors recalculated Straus and Bacon's (1953) data and reported that 65% of college students drank more than once a month, 52% drank more than twice a month, and 16% drank more than once a week. In their review of the more recent literature, Blane and Hewitt reported "sizeable increases" in the frequency of alcohol consumption relative to the 1953 data.

### *Recent Studies*

More recently, heavy episodic alcohol use has been deemed the "single most serious public health problem confronting American colleges" (Weschler & Dowdall, 1998; USDHHS, 2000). Since the initial research on college student substance use, college student drinking has become an increasingly studied topic (e.g., Weschler, Dowdall, Davenport, & Castillo, 1995; Weschler & Dowdall, 1998; Wechsler, et al., 2000). Five recently conducted large-scale national studies determined the prevalence and associated consequences of alcohol use, and more specifically, college student drinking. These studies include the National College Health Risk Behavior Survey (Centers for Disease Control and Prevention (CDC), 1997), the National Household Survey on Drug Abuse (Gfroerer, Greenblatt, & Wright, 1997), the Monitoring the Future study (Johnston, O'Malley, Bachman, & Schulenberg, 2004), the CORE Institute study (O'Malley & Johnston, 2002), and the Harvard College Alcohol Study (Wechsler et al., 1995). Some of these studies have been conducted several times, thus allowing cross-sectional comparisons of drinking trends over time.

The CDC's (1997) National College Health Risk Behavior Survey assessed a nationally representative sample of 4,838 college students at 136 2- and 4-year

institutions. It found 68% of students had consumed alcohol once in the past month and 42% of college students had consumed five or more alcoholic drinks in one occasion.

The National Household Survey on Drug Abuse, which utilized in-home questionnaires, began surveying individuals living within group housing in 1991, thus expanding the study to include college students living in dormitories or residence halls (O'Malley & Johnston, 2002). Gfroerer et al. (1997) analyzed the 1991-1993 survey data resulting in the first study of substance use among college-students and same-aged non-college peers. The study analyzed the effects of educational status and living arrangements with regard to alcohol use. The researchers defined heavy alcohol use as consuming five or more drinks per occasion on five or more different days of the past month. The definition of a college-aged population included individuals between 17-22 years old, not enrolled in high school, and who had not completed 4 years of college. Of the 12,026 individuals surveyed, 4,848 qualified as college students and 3,018 qualified as same-aged non-college peers. College students not living with their parents drank more heavily (16.9%) than college students living with their parents (7.2%). However, educational status was not a significant predictor of heavy alcohol use among the college-aged population.

Comparisons between college students and their same-aged non-college peers are also available in the Monitoring the Future project, a longitudinal survey beginning with high school students and continuing into young adulthood. This project began with a sample of high school seniors in 1976 and since then has completed 25 surveys of college student substance use (Johnston et al., 2004). The researchers reported that 28% of high school seniors engaged in occasional heavy drinking (i.e., five or more drinks in one sitting at

least once in the past 2 weeks), while 39% of college students, 36% of the young adult sample, and 26% of 29-30 year olds reported such a pattern of alcohol use. From 1980 to 1993, occasional heavy drinking among college students declined (44% to 40%), although this decrease was not as prominent as that among high school seniors (41% to 28%) or same-aged non-college peers (41% to 34%). In 2003, 39% of college students, 28% of high school seniors, and 34% of non-college young adults reported occasional heavy drinking. Thus, these data indicate that college students are the heaviest drinkers when compared to these other samples of young individuals.

The Core Institute (CORE) of Southern Illinois University began surveying college student substance use in 1989 (O'Malley & Johnston, 2002). This survey sampled 68,000 undergraduate students from 133 colleges nationwide (CORE, 2004) and assessed annual and 30-day prevalence rates of substance use, heavy and frequent substance use, and related consequences. The survey defined binge drinking as the consumption of five or more drinks in one sitting at least once in the previous 2 weeks. The definition of heavy and frequent alcohol use included individuals who binge drank at least once in the previous 2 weeks and reported drinking alcohol on three or more occasions per week. Students (including graduate/professional, non-degree seeking and other) reported annual (84.7%) and 30-day (72%) alcohol usage. The average number of drinks consumed per week was six. The percent of students who binge drank was 48.8%. Twenty-two percent of students reported heavy and frequent alcohol use.

In 1993, Wechsler et al. (1995) initiated the most nationally representative survey of college student alcohol use, the Harvard College Alcohol Study (CAS), and continued to collect data in 1997, 1999, and 2001. Beginning in 1993, the researchers surveyed 140 4-

year colleges and universities selected from accredited institutions identified by the American Council on Education. Random sampling resulted in 28,709 students, with a total sample of 17,592 after attrition, resulting in a 69% return rate. Students received via mail a 20-page survey containing questions about their alcohol use and other health-related behaviors. The survey questioned male students to “Think back over the last two weeks. How many times have you had five or more drinks in a row?” and for female students “During the last two weeks, how many times have you had four drinks in a row (but no more than that)?” These survey questions represented the first use of a gender-specific definition of a binge drinking episode in the literature. Wechsler et al. (1995) defined a binge drinker as a male (or female) who had drunk more than five (or four) standard drinks in a row at least once in the previous 2-week period. The definition of an infrequent binge drinker was an individual that binge drank one or two times in the past 2 weeks and a frequent binge drinker was someone who binge drank three or more times in the past 2 weeks.

Data analyses for the CAS study included chi-square statistic analyses to determine differences among nonbinge drinkers, infrequent binge drinkers, and frequent binge drinkers. Sixteen percent of students were nondrinkers, 41% of students drank alcohol but did not binge drink, and 44% of students participated in binge drinking episodes within the past 2 weeks. Of the 44% binge drinkers, 19% were frequent binge drinkers. The designations of binge drinker and frequent binge drinker were strongly indicative of a heavier and more frequent alcohol use pattern for both men and women (e.g., drinking in order to get drunk). Also, binge drinking was related to age such that students between the ages of 17 and 23 had higher rates of binge drinking than older students. Among

college-aged students, those under 21 did not differ in rates of binge drinking as compared to those over 21 and there were no differences in binge drinking rates with regard to year in school. Logistical regression analyses determined differences in alcohol-related problems among frequent, infrequent, and nonbinge drinkers. Frequent binge drinkers were 7 to 10 times more likely to have unprotected sex, have unplanned sex, to get into trouble with the campus police, to damage property, or to get hurt or injured as compared to nonbinge drinkers.

In 1997, Wechsler and Dowdall (1998) resurveyed 130 of the original 140 colleges from the 1993 study. Response rates in 14 of the 130 schools were below 45% and were not included in the final data analysis. Of the 24,140 students who remained in the sample after attrition, 60% were contacted and responded to the survey resulting in a sample of 14,521 students. They found 42.7% of college students were binge drinkers, a small statistically significant decrease from the 44% reported in the original data. However, when demographic variables were controlled and a multiple logistic regression analysis conducted, the difference between the amount of binge drinkers in 1993 and 1997 was not significant. There was a significant increase in the number of students who abstained from alcohol use, 19% in 1997 as compared to the 15.6% in 1993. Additionally, data indicated a significant increase in the number of frequency binge drinkers, from 19.5% in 1993 to 20.7% in 1997. Wechsler et al. (2000) referred to these results as a “polarization effect”: the differentiation of two extreme groups in the college student population, those who binge drink frequently and those who abstain. The 1999 CAS survey, which included 14,138 students at 119 schools, produced similar results with a binge drinking rate of 44% (Wechsler et al., 2000).

### *Analysis of Prevalence Studies*

Gfroerer et al. (1997) analyzed the National Household Surveys on Drug Abuse (NHSDA) data collected from individuals living in group environments, such as college dormitories. This analysis represents the first comparison of college student and non-college student alcohol use from one data set. The researchers also included individuals housed in a group setting in order to lessen the threat of a sampling bias in their study. The analysis and methodology are notable strengths of the NHSDA study. However, during data collection, students who may have lived in a dormitory while attending college but who had returned home during a school break were identified as students who lived with their parents. This confound of living arrangement may have influenced the study's results.

The CORE study noted “all institutions used methods to insure a random and representative sample of their respective student bodies” (CORE, 2004). However, O'Malley and Johnston (2002) reported that the participating institutions did so on a voluntary basis and thus these data reflect a self-selected sample. Such a sample is a threat to the study's external validity and the generality of results to the college student population. However, when the results of the CORE study are compared to those of the other national surveys, issues of generality appear less threatening.

The use of a nationally representative sample of college students and a gender-specific definition of binge drinking are hallmarks and strengths of the Wechsler et al. (1995) Harvard College Alcohol Study. The CAS's longitudinal nature also allowed for an analysis of the trends of college student alcohol use, a component that has not always been accessible in this literature.

Thus, across these five nationwide studies with differing methodologies, college students reported similar rates of alcohol use. The rate of binge drinking ranges from 39% (Monitoring the Future) to 48% (CORE). O'Malley and Johnston (2002) noted that the consistency among these five studies suggests that there is "considerable validity" in stating that the rate of binge drinking is "quite high" among college students when defined as having five or more alcoholic beverages in a row within the past 2 weeks.

It is interesting to note the differences among rates of college student drinking as reported by Straus and Bacon (1953) and those of the five national prevalence studies. Straus and Bacon reported over 40% of men and 50% of women drank monthly while O'Malley and Johnston (2002) noted the 30-day prevalence rate of college student alcohol use as 69.6% (based upon Monitoring the Future data). O'Malley and Johnston also reported 40% of college students engaged in heavy or binge drinking at least once in the past month. Although a comparison of more recent binge drinking rates to the Straus and Bacon data is confounded by evolving alcohol use patterns and definitions, these data show only 9% of men and 1% of women reported drinking more than eight glasses (one glass is equal to 8 ounces) of beer in a sitting. Thus, when comparisons are made among the various definitions of a standard drink, it appears that "heavy drinking" students in 1953 (10%) consumed at least 64 ounces of alcohol in one sitting while the current definition of binge drinking indicates students (approximately 40%) consume at least five 12 ounce servings of beer, or a total of 60 ounces of beer on one occasion. Using this definition of "heavy drinking," it appears that current college students are more likely to engage in heavy episodic alcohol consumption than those students in 1953.

## Consequences of College Student Alcohol Use

As college student alcohol use, specifically, binge drinking, continues so will the associated harms. The negative consequences of college student binge drinking may include sexual aggression, contraction of sexually transmitted diseases, violence, car accidents and fatalities, destruction of properties, and school attrition. The research on negative consequences of college student alcohol use can be considered via objective or self-report data, and through second-hand effects (i.e., the effects of alcohol use on others).

### *Objective Data*

As a result of the National Advisory Council of the NIAAA task force to investigate college student alcohol use, Hingson, Heeren, Zakocs, Winter, and Weschler (2003) reported the negative consequences of college student alcohol use in 1998. Hingson, Heeren, Winter, & Weschler (2005) provided an updated report on the negative consequences of college student alcohol use from 1998 to 2001. The samples in both reports included students aged 18-24 enrolled in 2- and 4-year colleges. The researchers integrated data from the National Highway Traffic Safety Administration, the CDC, national coroner studies, census and college enrollment data for 18-24-year-olds, the National Household Survey on Drug Abuse, and the Harvard CAS. The 1998 data indicated that more than 1,400 students died from alcohol-related injuries including motor vehicle accidents. The updated report (2005) indicated an increase in alcohol-related unintentional injury deaths (e.g., deaths other than by suicide or homicide) of 6%, which approached statistical significance. A 5% increase in alcohol-related traffic deaths

in the college student population significantly exceeded that age's proportional population increase from 1998-2001 (Hingson et al., 2005).

### *Self-Reported Data*

According to Hingson et al. (2002), more than 2 million college students reportedly drove while under the influence of alcohol and more than 3 million students rode with an intoxicated driver. Additionally, more than 500,000 students were unintentionally injured while under the influence of alcohol, more than 600,000 were assaulted by a student who had consumed alcohol, and more than 70,000 students experienced a date rape perpetrated by a student who had consumed alcohol (Hingson et al., 2002).

Hingson et al. (2005) indicated that the proportion of 18-24 year old college students who reported driving while under the influence of alcohol increased significantly (26.5% to 31.4%) from 1998 to 2001. However, there was a nonsignificant increase in the number of students who drank more than five drinks per occasion and who reported experiencing an alcohol-related health problem.

According to the Harvard CAS, the adjusted odds ratios for frequent binge drinkers indicated that they are 25 times more likely than nonbinge drinkers to experience alcohol-related problems (Wechsler, Davenport, Dowdall, Moeykens, & Castillo, 1994). Such alcohol-related problems as missing a class, unplanned sexual activity, getting in trouble with the campus or local police, and driving after having five or more drinks increased among college students in 1997 (25%) from those students surveyed in 1993 (22%) (Wechsler & Dowdall, 1998). This difference was statistically significant and appeared similar for both men and women. Within the frequent binge drinker sample, 47% of students reported experiencing five or more alcohol-related problems, while only 14% of

infrequent binge drinkers and 3% of nonbinge drinkers did so. However, the prevalence of alcohol-related problems did not appear to increase significantly from 1997 to 1999. The rate of experiencing five or more alcohol-related problems for frequent binge drinkers was 48% and 3.5% for nonbinge drinkers in 1999 (Wechsler et al., 2000).

College students also reported that the most common negative consequences from heavy drinking included “feeling nauseous, tired, and vomiting,” “spending too much money,” and “feeling sad, blue, or depressed” (Fearnow-Kinny, Wyrick, Hansen, Dyreg, & Beau, 2001). The most frequently reported consequences from the CORE study similarly included feeling hung-over (64.3%), feeling nauseous or vomiting (55.7%), doing something that was later regretted (39.1%), memory loss (34.4%), and missing class (32.9%). CAS data indicated that among students who drank alcohol during the past year, 53.9% reportedly fell behind in school work, 52.3% engaged in unprotected sex, 49.7% engaged in unplanned sex, 58.9% experienced an injury as the result of alcohol use, 40.6% reportedly had driven after drinking, and 52.3% reportedly experienced blackouts (Wechsler & Dowdall, 1998). Thus, as indicated by these studies, college students’ self-report of alcohol-related negative consequences affect academic, physiological, and interpersonal aspects of their lives.

### *Second-Hand Effects*

The negative consequences of college student alcohol use not only affect the individual who consumes alcohol but others such as friends or roommates. There are second-hand effects of binge drinking, similar to the second-hand effects of cigarette smoke. Wechsler and Dowdall (1998) reported the most frequent second-hand alcohol-related problems were having study time or sleep interrupted (60.6%), having to take care

of a drunken student (50.2%), and being insulted or humiliated (28.6%). (These data are from the 1997 CAS; however, they are similar to the second-hand effect data found in the 1993 survey).

### *Abuse and Dependence*

The development of an alcohol-related disorder is another possible consequence of binge drinking (Knight, Wechsler, Kuo, Seibring, Weitzman, & Schuckit, 2002). Alcohol abuse is defined as a maladaptive pattern of substance use resulting in failure to meet developmentally appropriate goals, such as maintaining a career, sustaining a meaningful interpersonal relationship, and impairment in occupational, social, or recreational functioning (American Psychiatric Association, 2000). These same symptoms are apparent in alcohol dependence, although the effects of alcohol use are more pervasive across areas of cognitive, psychological, and physiological functioning. Specifically, alcohol dependence is characterized by tolerance (the need to consume more alcohol to achieve the desired effect), withdrawal (a physiological reaction due to the discontinuation of alcohol use), and compulsive alcohol use, or spending a great deal of time trying to obtain alcohol, use alcohol, or recover from its' effects (American Psychiatric Association, 2000).

Knight et al. (2002) sampled 14,115 college students from 119 American colleges and universities. Participants completed a questionnaire that included items from the Semi-Structured Assessment for the Genetics of Alcoholism (SSAGA; Bucholz et al., 1994). The researchers defined a diagnosis of alcohol abuse as a positive response to any one of four abuse criteria (as established in the Diagnostic and Statistical Manual of Mental Disorders—4<sup>th</sup> Edition (2000)) and/or a positive response to less than three

dependence criteria. The definition of alcohol dependence was a positive response to any three of seven dependence criteria (Knight et al., 2002). They found 31.6% of students met criteria for alcohol abuse and 6.3% of students met criteria for alcohol dependence. The authors also noted a strong positive correlation between a student's alcohol use pattern and an alcohol-related diagnosis. Students who reported frequent heavy episodic drinking (i.e., males who consumed 5 or more and females who consumed 4 or more alcoholic drinks on three or more occasions in the past two weeks) were 19 times more likely to be diagnosed as alcohol dependent and 13 times more likely to receive a diagnosis of abuse than those students who did not drink as heavily.

Dawson, Grant, Stinson, and Chou (2004), in their report of alcohol abuse and dependence among 18-29 year-olds, commented on the use of the SSAGA as a measure that overestimated rates of abuse and underestimated rates of dependence. Dawson et al. analyzed responses from 43,093 individuals collected in the 2001-02 National Epidemiologic Surveys on Alcohol and Related Conditions. Their analysis included individuals 18-20 years old and took college status and residence into account. Rates of alcohol abuse ranged from 5.3% (college student living with parents) to 8.0% (college student living off campus), which is lower than the rate in the Knight et al. (2002) study, but the rates of dependence are higher, ranging from 6.7% (college students living with their parents) to 20.2% (college students living on campus) as compared to Knight et al's report of 6.3%.

Other research based on the 2001 National Household Survey on Drug Abuse indicated that of 6,352 respondents aged 19-21, 6.1% of those attending college met criteria for alcohol dependence while 11.9% met criteria for alcohol abuse (Slutske,

2005). Of respondents who did not attend college, 6.6% met criteria for alcohol dependence and 8.5% met criteria for alcohol abuse. College students were significantly more likely to meet criteria of alcohol abuse than dependence when compared to same-aged noncollege peers. Therefore, it appears that rates of alcohol abuse and dependence among young people vary as a function of measurement, residence, and college status. However, evidence exists to support significant rates of college student alcohol abuse (5-11%) and dependence (6-31%), including such previously mentioned consequences as decreased academic functioning and legal issues. Given the gravity of college student alcohol use patterns and related consequences, it is not surprising that alcohol abuse, specifically binge drinking, has been deemed a major health issue facing college students today (USDHHS, 2000).

#### The Use of Brief Intervention to Reduce College Student Drinking

Although some students will decrease their alcohol consumption without any intervention (Baer, Kivlahan, Blume, McNight, & Marlatt, 2001; Vik, Cellucci, & Ivers, 2003), the prevalence of college student drinking and the resulting negative consequences has spurred research aimed at understanding these phenomena and developing intervention techniques specific to this population. College student drinking is typically conceptualized from a harm reduction approach and treatment has centered on brief interventions (e.g., Larimer & Cronce, 2002).

Brief interventions target individuals with mild to moderate substance use-related problems in an attempt to reach individuals who may not otherwise seek traditional forms of substance abuse treatment such as hospitalization or 12-Step support groups (Zweben & Fleming, 1999). The primary goal of these interventions is to increase an individual's

motivation to change their substance-related behavior. These interventions do not necessarily teach specific skills (although some employ a cognitive-behavioral/skills training component) or attempt to change the individual's environment. Rather, brief interventions aim to (a) increase awareness regarding the costs and consequences of substance use, (b) strengthen an individual's beliefs about their ability to change their behavior, (c) utilize helping techniques to support change, (d) encourage individuals to accept responsibility for change, and (e) promote commitment to change (Zweben & Fleming, 1999). Brief interventions have become a viable alternative to more intensive treatment (Bien, Miller, & Tonigan, 1993) and are more cost efficient and less time intensive. Brief interventions have been more effective than no treatment and as effective as more intensive treatment (Bien et al., 1993).

#### *History of Brief Interventions*

Utilization of brief interventions began in the 1960s in an attempt to improve client utilization of alcohol-related services (Bien et al., 1993). Such brief interventions included a telephone call or handwritten note reminding the client to return for a follow-up appointment or treatment. Edwards et al. (1977) conducted the first study comparing brief interventions to more extensive treatment. Edwards et al. randomly assigned 100 male alcoholics who presented to an outpatient treatment facility either to an advice group or a treatment group. Both groups received an initial assessment during which subjects were encouraged to abstain from alcohol. However, the advice group was informed that the responsibility of meeting their goals "lay in their own hands" and that they would not be offered an additional appointment at the outpatient clinic, but instead would be contacted monthly to assess their progress. Subjects in the treatment group

continued with an outpatient treatment including strategies for abstinence, “reality problems,” and interpersonal interactions. Self-report data collected at a 12-month follow-up indicated no significant differences between groups with regard to the longest period of abstinence obtained. Subjects in the advice group reported their longest period of abstinence as 15.3 weeks ( $SD = 2.6$ ) while subjects in the treatment group reported 15.8 weeks ( $SD = 2.3$ ). Among those subjects who continued to drink more than 10 pints of beer on any given day of the week, there were no significant differences between groups. Subjects in the advice group reported engaging in this pattern of heavy alcohol use 15.5 weeks ( $SD = 3.2$ ) and those in the treatment group reported 13.9 weeks ( $SD = 2.5$ ) during the one-year follow-up period (Edwards et al., 1977).

Kristenson, Ohlin, Hulten-Nosslin, Trelle, and Hood (1983) conducted a long-term study of alcoholics randomly assigned to receive a brief intervention ( $n = 317$ ) or a no-treatment control group ( $n = 268$ ). Four-hundred-seventy-three subjects completed the 2- and 4-year follow-up. Serum- $\gamma$ -glutamyltransferase (GGT), a liver enzyme, was analyzed to identify heavy-drinking subjects. Subjects in the intervention group were offered consultations with a physician every 3 months with a focus on the moderation of alcohol use. Thus, drinking was allowed as long as the individual’s GGT levels were not elevated. Subjects in the control group received a letter informing them that they had an impaired liver. They were encouraged to restrict alcohol use and were informed that their liver would be tested again in 2 years. Both groups exhibited a significant decrease in GGT levels at 2- and 4-year follow-up. However, the brief intervention group reported significantly fewer sick days taken from work ( $M = 5.3$  versus  $M = 27.2$ ) and days

hospitalized for alcohol-related conditions ( $M = 133$  versus  $M = 482$ ) as compared to the control group (Kristenson et al., 1983).

In an extensive international evaluation of brief interventions, World Health Organization researchers Babor and Grant (as cited in Bien et al., 1993) randomly assigned at-risk drinkers identified in a health interview ( $N = 1,490$ ) to receive either no treatment, 5 minutes of advice, or advice plus 15 minutes of counseling and a self-help manual. They sampled subjects across 10 nations. Those subjects receiving any type of brief intervention reduced their alcohol consumption by 33% as compared to the no treatment group at a 9-month follow-up.

In a review of brief interventions, Zweben and Fleming (1999) identified 14 studies (of which only five were conducted in North America) comparing brief intervention to a control group among nondependent drinkers. The authors summarized the results of these studies and indicated that brief interventions delivered in primary care settings promoted reductions in drinking across both genders, may facilitate individuals to pursue specialized alcohol treatment programs, and reduced the utilization of other health care services. Zweben and Fleming (1999) reviewed brief intervention studies targeting alcohol dependent individuals and concurred with the conclusions drawn by Bien et al. (1993). They concluded that there was no evidence to support extensive treatments as a more effective intervention than brief interventions across a broad range of individuals seeking assistance, and that brief interventions were more effective with those individuals who had relatively less severe substance-use problems.

### *Components of Brief Interventions*

Miller and Sanchez (1994) identified six common elements found in brief interventions: feedback, responsibility, advice, menu, empathy, and self-efficacy (FRAMES).

Personal *feedback* is a common element in brief interventions. Feedback focuses on the individual's risk status and their extent of alcohol-related problems. This feedback is different from providing general information about the effects of alcohol use. Feedback is tailored for the individual and their personal consequences from drinking (Miller & Sanchez, 1994). Interestingly, providing personalized feedback alone, instead of as one component to an intervention, reduces college student drinking (Agostinelli, Brown, & Miller, 1995). Such feedback can be disseminated via mail (Collins, Carey, & Sliwinski, 2002), or in-person, but without a clinician-directed motivational interviewing component (Murphy et al., 2004).

Brief interventions also address the individual's *responsibility* for changing their behavior. Responsibility may be conveyed either implicitly or explicitly, but the message is that the individual has the ability to change. No person or treatment program has the power to change the individual. This component of brief intervention harkens back to the literature on intrinsic motivation and internal attribution (Miller & Sanchez, 1994).

*Advice* is the third component of brief interventions. Merely advising an individual to reduce his or her drinking is not overwhelmingly successful. However, in the context of brief interventions, providing direct advice or admonishment appears to increase motivation for change (Miller & Sanchez, 1994).

Providing a *menu* of options from which to choose appears to enhance motivation to change as well. The menu of options can apply toward strategies for change (e.g., approaches to changing behavior) or goals of change (e.g., abstinence versus moderation). An options' menu also increases the chance of appropriate client-treatment matching and can underscore the importance of personal control (Miller & Sanchez, 1994).

*Empathy* is another key aspect of brief interventions. In this context, empathy does not refer to having had similar experiences as the client (e.g., being a recovering alcoholic) but to the concepts of reflective listening and accurate understanding promoted by Rogers (1951). Demonstrations of empathy appear to be a strong marker of effectiveness for intervening with problem drinkers (Miller & Sanchez, 1994).

The final component of brief interventions is *self-efficacy*. The belief that people have the ability to change their behaviors increases the motivation to attempt to do so. In addition, as the therapist conveys his or her belief that the individual is able to effect change in his or her life, motivation is further enhanced (Miller & Sanchez, 1994).

These six components (FRAMES) may be considered elements of effective brief interventions (Miller & Sanchez, 1994), but are each of them necessary to elicit change? In a review of 32 brief intervention studies utilizing the FRAMES components, Bien et al. (1993) asserted that perhaps only advice is necessary for change. The authors posited that the effectiveness of brief interventions resides within the impact upon an individual's motivation for change. The level of motivation for change is impacted by creating a perceived discrepancy between the individual's current status and desired goals, which

instigates a natural process of change. Nonetheless, Bien et al. (1993) agreed that there is a need for more studies to identify the active ingredients in brief interventions.

Zweben and Fleming (1999) identified several “unresolved issues in brief interventions” that may impact effectiveness but have yet to be sufficiently addressed. These issues include the number and length of sessions, population-based response differences (e.g., gender), and the involvement of a significant other. The authors concluded that the most effective number and length of intervention sessions has yet to be determined, but that tentatively, women may be more responsive to brief interventions than men, and that including a significant other in the intervention may increase motivation for change.

Although there is a need for more research regarding the FRAMES components, there is research on many of the individual components as part of broader studies on the therapeutic relationship in psychotherapy. The concept of empathy as a condition in therapy is an example. In a study of alcohol-dependent patients, Chafetz et al. (as cited in Bohart, Elliot, Greenberg, & Watson, 2002) reported that one empathetic counseling session increased the frequency of seeking treatment and the likelihood of remaining in treatment. Bohart et al. (2002) stated that “empathy serves as a positive relationship function” such that when a client feels understood in therapy, his level of treatment compliance increases, and his perceived level of safety in self-disclosure increases.

#### *BASICS: A Brief Alcohol Screening and Intervention for College Students*

Dimeff, Baer, Kivlahan, and Marlatt (1999) developed the Brief Alcohol Screening and Intervention for College Students (BASICS) program, which incorporates brief interventions using the FRAMES components. The BASICS program is a brief

intervention designed specifically for college student heavy drinkers and those students who have experienced or are at risk for experiencing negative consequences related to alcohol use. This type of prevention is referred to as “indicated prevention” (Dimeff et al., 1999). Indicated prevention is contrasted with universal prevention, which targets the general college student population, and selective prevention, which targets specific subgroups within the college student population such as freshmen.

In addition to being designed specifically for college students, the model on which the BASICS program was developed consists of three assumptions. First, many students lack important information and coping skills to drink moderately. Second, certain developmental milestones in a young adult’s life contribute to heavy drinking (e.g., separation from parents and assumption of adult privileges). Finally, personal factors (e.g., faulty beliefs about alcohol) and environmental factors (e.g., peer pressure, heavy drinking friends, and a mindset of drinking in order to get drunk) inhibit the use of behavioral skills (e.g., drinking moderately) that students possess (Dimeff et al., 1999).

The BASICS program also utilizes the harm reduction approach, which focuses on moderation of alcohol use, not abstinence, and therefore is different from the traditional disease model of alcoholism or the “Just Say No” program, both of which establish abstinence as the primary goal. A harm reduction approach views alcohol-related problems on a continuum and encourages incremental changes toward less risky alcohol use patterns. The primary goal of a harm reduction approach is to reduce the negative consequences or associated harms of risky alcohol use. There are nine assumptions of harm reduction that influenced the development of the BASICS program (Dimeff et al., 1999):

1. Student-chosen drinking goals are more powerful than drinking goals articulated or required by others.
2. The factors that maintain heavy drinking in college students are different from those factors that maintain heavy drinking in older adults; a brief intervention for college students is most likely to be effective if it addresses these unique factors.
3. Risk reduction, without further specification of outcomes (e.g., abstinence, full moderation from drinking), is itself a valid goal for a brief intervention for high-risk drinkers.
4. The goals of a brief intervention focused on college students should be realistic and achievable, even if they do not eliminate all risks.
5. Behavioral “slips” are normal.
6. Moderate drinking to decrease harmful effects can be as enjoyable as heavy, hazardous drinking.
7. Successful experiences in the direction of achieving goals are more important than immediate and complete elimination of risk.
8. Risk reduction can continue indefinitely, with students continuing to practice and improve over time.
9. The least intensive intervention should be applied first before proceeding to more intensive interventions (stepped-care approach).

One key element in the implementation of the BASICS program is the use of motivational interviewing (Miller & Rollnick, 2002). Motivational interviewing techniques increase college students’ motivation to reduce risky alcohol use patterns.

The technique is supportive, flexible, and nonjudgmental rather than confrontational or rigid. In addition, the BASICS program consists of providing education regarding college student drinking and associated negative consequences.

Given the goal of the BASICS program is to assess and provide interventions for heavy drinkers in a college environment and that college students value their leisure time, BASICS entails a brief intervention. Typically, college students will attend two clinician-led 50-minute individual interview sessions. During the first session, the clinician gathers information regarding frequency and amount of alcohol use, beliefs regarding college student alcohol use, the amount of time and money spent on alcohol, and negative consequences from alcohol use. Simultaneously, the clinician utilizes motivational interviewing techniques to understand the student's level of motivation to change his/her behaviors regarding alcohol use. Either before or after the initial clinical interview, the BASICS program requires an additional 50 minutes during which the student completes various self-report measures regarding alcohol use. Information collected via a clinical interview and self-report measures is then combined to create a personalized feedback form for the student.

During the second BASICS session, the clinician presents the personalized feedback to the student in an educational and non-confrontational manner. Students receive information regarding their beliefs about alcohol use among college students and how these beliefs compare to normative data regarding college student alcohol use, information regarding the students' drinking patterns and how they compare to a typical college student, and risk factors for the development of alcohol problems such as the frequency of binge drinking. Personalized feedback also includes a blood alcohol content

based upon a typical night of alcohol use for that student as well as information regarding the negative consequences related to alcohol use within the past 28 days and how the student's frequency of consequences compare to a typical college student. The student also receives information regarding how much time is spent drinking and recovering from alcohol use in comparison to other activities, the amount of calories consumed through alcohol and the time required to expend these calories in exercise, and how much money the student spends weekly, monthly, and yearly on alcohol.

Walters and Neighbors (2005) reviewed 13 intervention studies that provided feedback to college students about their alcohol use. Seventy-seven percent of the studies reported a significant reduction in alcohol use when compared to a comparison or control group. Although the studies varied across methodology, every intervention provided a drinking summary and 12 studies provided feedback regarding alcohol-related consequences. Other components of feedback included risk factors (11 studies), didactics (10 studies), campus norms (9 studies), moderation strategies (7 studies), US norms (6 studies), expectancies (5 studies), blood alcohol content and other norms (4 studies). The authors also noted that feedback appeared effective whether delivered face-to-face, via the Internet, or delivered by mail.

*Empirical support for BASICS.*

The BASICS intervention has empirical support. In one of the formative studies, Baer, Marlatt, Kivlahan, Fromme, Larimer, and Williams (1992) conducted a longitudinal study to compare at-risk college students across three brief intervention experimental groups: classroom format, self-help correspondence format, and individualized feedback and advice format. The original design included three separate

cohorts. However, due to significant treatment exposure effects (the self-help correspondence group exhibited poor treatment completion and high attrition), the self-help group was abandoned and the remaining subjects randomly assigned either to the classroom or individualized treatment groups. There was an overall reduction of alcohol use at the end of treatment, with the greatest effects seen within the classroom group, although these effects were not significantly different than those in the individualized group. From baseline to follow-up, the self-monitored number of standard drinks consumed per week declined from 13.2 to 8.7, the estimated peak blood alcohol concentration decreased from 0.15% to 0.10%, and the retrospective number of drinks consumed per month decreased from 49.9 to 41.1 within the classroom group. These changes in alcohol use patterns appeared to maintain throughout a 2-year follow-up period.

Marlatt et al. (1998) also conducted a formative study that lent initial support to the BASICS model. These researchers conducted a longitudinal study to compare at-risk high school students entering college to a normative comparison sample. In a randomized controlled trial, at-risk students (e.g., students were screened during their senior year of high school) were assigned either to a brief intervention group or a no treatment control group after beginning college. A third group of incoming freshmen served as a natural history comparison. Assessment of alcohol related behaviors included quantity, frequency, peak consumption of alcohol, and the Rutgers Alcohol Problem Index (RAPI; White & Labouvie, 1989) as a measure of alcohol related problems in the past 6 months. Follow-up assessments occurred at the first 6 months post-baseline and then each subsequent fall semester for 2 years.

Marlatt et al. (1998) found that participants in the treatment group reported drinking less frequently, drinking less alcohol over time, and a lower peak quantity of alcohol use at the 2 year follow-up as compared to the control group. These results were statistically significant and the treatment effect sizes were modest (e.g., ranging from .14 to .20 for quantity, frequency, and peak consumption). On average, the treatment group reported a significant decrease in the number of drinks consumed per occasion from 4.7 to 3.6 while the control group reported a nonsignificant decrease from 4.2 to 4.0. Similarly, the number of self-reported problems from alcohol use significantly decreased in the treatment group from 7.5 at baseline to 3.3 at 2-year follow-up, as compared to 7.6 and 4.7, respectively, for the control group, with an effect size of .32. Regarding evaluations of the intervention, 88% stated they would recommend the interview to a friend. Ninety-seven percent agreed that the interview was thorough and complete, 99% that the interviewer was well organized, 98% that the interviewer was competent, and 98% that the interviewer was warm and understanding.

The initial studies by Baer et al. (1992) and Marlatt et al. (1998) led to the development and dissemination of a BASICS treatment manual, and recent studies have used the manualized protocol. Borsari and Carey (2000) compared at-risk college students in two experimental groups: a brief intervention group and a no treatment control group. Alcohol use patterns assessed at baseline and at a 6 week follow-up session indicated that subjects in the treatment group significantly decreased the number of drinks consumed each week (17.57 drinks to 11.40 drinks), the frequency of alcohol consumption in the past 30 days (4.41 days to 3.83 days), and the frequency of binge drinking episodes in the past 30 days (3.20 episodes to 2.55 episodes) when compared to

the control group. There were no significant differences between groups regarding to self-reported alcohol use problems. Although the study did not include a treatment comparison group, subjects rated the brief intervention format with high levels of satisfaction. The study also assessed mediating variables of risky alcohol use. The subject's estimate of a typical college student's weekly alcohol consumption mediated the relationship between group membership and rates of drinking at follow-up. Those individuals with higher estimates of drinking exhibited greater reductions in the number of drinks they consumed per week, the number of occasions they drank, and the frequency of binge drinking. The authors hypothesized that the changes in alcohol use patterns resulted from the subjects' attempt to reduce the discrepancy between the beliefs about their peers and their own behaviors brought about by the brief intervention.

Murphy et al. (2001) evaluated the efficacy of the BASICS model among heavy drinking college students. As an extension of previous research (i.e., Baer et al., 1992; Marlatt et al. 1998), this study included a control group with an intervention, and 3- and 9-month follow-up assessments. Random assignment placed students in one of three experimental conditions: the BASICS condition, an education condition, and an assessment only control group. No overall significant group differences were found, although effect sizes within the BASICS group for alcohol consumption measures appeared moderate (mean 3-month effect size 0.47, mean 9-month effect size 0.63). When analyzed with only the upper 50% of heavy drinking students (i.e., those students who reported 20 or more drinks per week), significant decreases in alcohol consumption within the BASICS group and greater decreases in drinks per week and frequency of binge drinking at the 3-month follow-up were found. As in the Borari and Carey study

(2000), the authors noted that the BASICS program may be particularly effective for heavy drinking college students. There were no significant differences between groups at the 9 month follow-up although students in the BASICS group maintained their reduced levels of alcohol use.

Baer et al. (2001) utilized the BASICS manual in a longitudinal study of college freshmen. The authors randomized incoming freshmen to one of three groups: high risk prevention, high risk control, and natural history. “High risk” groups included individuals who reported drinking at least once a month and consuming at least 5-6 drinks on one occasion or experiencing at least three negative consequences of alcohol use on 3-5 different occasions in the past 3 years. After providing baseline data, participants completed further assessments by mail on an annual basis for 4 years. The high risk prevention group received personalized feedback from a clinician during their first year, and mailed personalized feedback during their second year followed by phone contact. Significant main effects over time were found such that both prevention and control groups decreased the quantity, frequency and negative consequences of alcohol use. However, the prevention group demonstrated a significant group by time interaction such that individuals in the prevention group reported significantly fewer alcohol-related problems after 4 years than the control group. Baer et al. interpreted these results as support for the use of BASICS among college students within a harm reduction model.

Carey, Carey, Maisto, and Henson (2006) randomized 509 heavy drinking college students into one of six intervention groups to determine the incremental values of including the Timeline Followback (TLFB) interview and a Decisional Balance (DB) exercise in Brief Motivational Interventions (BMIs). The experimental conditions

included the presence or absence of a TLFB crossed with either a basic BMI, an enhanced BMI (e.g., included a DB exercise), or no intervention. The no treatment group gradually decreased alcohol use and alcohol-related consequences over 12 months, whereas the intervention groups exhibited a sharp initial decrease in alcohol use and alcohol-related variables and then remained stable through the end of the follow-up period one year. Among the intervention groups, the TLFB only condition reduced alcohol use and alcohol-related consequences more so than no treatment, the enhanced BMI condition showed similar reductions as well, but not as much of a reduction as the BMI condition. Thus, the addition of the DB exercise did not appear to enhance BMI outcomes. Although the TLFB assessment alone reduced alcohol use within 1 month and the basic BMI reduced risky alcohol use both at 1 month and 12 month intervals, a combination of BMI and TLFB may enhance these initial reductions even more so among heavy drinking college students.

Whereas all of the previous studies used samples of at-risk college students, Borsari and Carey (2005) randomized 64 mandated students (e.g., students who had violated the school alcohol policy and were referred for an evaluation) into two individual-based interventions: either a brief motivational interview (BMI) or an alcohol education session (AE). The BMI was based on the BASICS program and contained personalized feedback. The AE presented general information regarding alcohol use and its effects. Mandated students in both groups reported less alcohol use at 3-month follow-up. However, students in the BMI group reported fewer alcohol-related problems at 3- and 6-month follow-ups (3-month BMI within group effect size 0.90, 6-month BMI within group effect size 1.11). White, Morgan, Pugh, Celinska, Labouvie, and Pandina

(2006) also utilized a mandated student sample in a randomized comparison of a BMI and a written-feedback only (WF) condition. Students in both conditions reported a decrease in quantity of alcohol use, frequency of heavy episodic drinking, peak BAC, and alcohol-related problems. White et al. (2006) commented that these results support the use of BMI with mandated students, although these reductions in alcohol use may also be attributed to the students' general response to being referred for an alcohol-related infraction.

*Summary and Critique of BASICS.* The BASICS program is effective in reducing the rate of college student risky drinking behaviors by up to 40% (Baer et al., 1992) as well as negative alcohol-related consequences (Marlatt et al., 1998; Baer et al., 2001). Treatment effect sizes for the BASICS intervention vary between modest (Marlatt et al., 1998) and more robust (Borsari & Carey, 2000) for long-term and immediate follow-up. In particular, BASICS appears especially effective for those college students who are heavy drinkers (Borsari & Carey, 2000; Murphy et al., 2001, Carey et al., 2006). Reductions in alcohol use patterns remain up to a 2-year-follow-up (Baer et al., 1992; Marlatt et al., 1998) and reductions in related negative consequences up to a 4 year follow-up (Baer et al., 2001). When compared to other more intensive interventions (e.g., six 90-minute meetings conducted in a classroom format), the effectiveness of BASICS does not significantly differ (Baer et al., 1992), providing more support for the use of such a brief intervention among college students. College students rate BASICS more favorably (Marlatt et al., 1998; Borsari & Carey, 2000; Murphy et al., 2001) than they do other interventions.

Despite the growing research in support of the BASICS program, there are limitations to these studies. There are eight empirical studies documenting the effectiveness of the BASICS program. However, each study was conducted at a large university, and three of these studies were conducted within the same research team at the University of Washington. Thus, there may be limits to the generality of these findings toward students at smaller universities or colleges. Furthermore, although there is good initial evidence with regard to the effectiveness of BASICS as a selective prevention among freshmen, there have been no research efforts investigating how BASICS may be modified to intervene more effectively with this special college student population.

#### Use of BASICS with Freshmen

College student drinking and negative alcohol-related consequences have become a nationwide public health concern. College freshmen in particular have been identified as a unique population and one at an increased risk for harm. In a special report on college student alcohol use and freshmen, USA Today deemed the first year of college as the “riskiest.” Analysts reported 620 alcohol-related deaths at 4-year colleges and universities since 2000. Although freshmen consist of 24% of the undergraduate population, first-year students accounted for 35% of student deaths (e.g., drowning, falls, suicide, vehicular, drug/alcohol overdose; Davis & DeBarros, 2006). Two out of three underage college students reported drinking alcohol in the past 30 days (Wechsler, n.d.). In 1999, 42.1% of freshmen met binge drinking criteria and 22.3% reported frequent binge drinking (Wechsler et al., 2000). Similarly, White, Kraus, and Swartzwelder (2006) reported that 19.9% of males and 8.2% of females consumed 10+ drinks and 8+ drinks, respectively, at least once in the previous 2 weeks. In a 10-year longitudinal

study of college students, O'Neill, Parra, and Sher (2001) reported that the highest rates of alcohol-related symptomatology occurred in the first year of college. However, for many individuals their alcohol use patterns begin while they are high school students.

### *Risk Factors*

An obvious risk factor of college freshmen alcohol use is the rates of alcohol use during high school and the continuation of drinking into college. According to the CAS data, over 73% of college students reported binge drinking while in high school.

Similarly, the Monitoring the Future 2005 data for 12<sup>th</sup> grade students indicated that 47% reported alcohol use within the past 30 days and 30.2% reported having been drunk.

Arata, Stafford, and Tims (2003) surveyed 930 high school students and found that 24% of males and 28% of females reported no use of alcohol, 34% of males and 53% of females reported moderate drinking, and 41% of males and 19% of females reported problem drinking. Congruent with the CAS and MTF data, 75% of students reported having consumed alcohol in the past school year, with 30% reporting frequent binge drinking. Thus, it appears that perhaps some risky alcohol use patterns may begin to emerge even before the individual reaches a university level.

Another hypothesized risk factor is that people who drink at a young age are greater risk takers and thus are more likely to exhibit risky behaviors. Hingson et al. (2003) analyzed the 1999 CAS data to determine if people who reported drinking to intoxication at ages younger than 19 were more likely to become alcohol dependent or frequent heavy drinkers, to be injured while drinking, to be injured when not drinking, to drive and ride with others after drinking, and to engage in risky behaviors because they believe they can drink more and still drive safely and legally. However, Hingson et al.

found that the younger people are when they first become intoxicated, the more likely they are to become alcohol dependent and frequently drink heavily, to be seriously injured after drinking, and to drive or ride with others after drinking. They also found that people who become intoxicated at a young age were not more likely to be injured when not drinking. The authors interpreted these results to mean that early intoxication does not necessarily mean that those individuals are greater risk takers in general. However, those individuals who drank at an early age are more likely to engage in risky behaviors after drinking because they believe they can consume more drinks and drive safely and legally.

These results may relate to the effect of alcohol expectancies. Alcohol expectancies are established very early, perhaps even before one begins to drink alcohol, and are as predictive of drinking style as are background variables such as age, attitude, religiosity, maternal drinking, and socioeconomic status (Christiansen & Goldman, 1983). The implication of the expectancy model is that students arrive on campus with stable, but often incorrect, perceptions about the manner in which college students use alcohol (e.g., the number of students who drink and drive, the frequency of binge drinking). Freshmen who attempt to act congruently with their expectations of college student alcohol use are then placed at greater risk for alcohol-related problems. Therefore, one potential risk factor of freshmen, particularly those who began drinking at an early age, is their beliefs and expectations regarding alcohol use.

### *Special Considerations*

Some of the special considerations of freshmen include being away from home, a reduction in parental restrictions, and an increased level of freedom (Hartzler & Fromme,

2003). Although freshmen may arrive on campus with expectations of how college students use alcohol or their own prior experiences with drinking, the majority of traditional freshmen are still under the legal age for the purchase and consumption of alcohol. This legal restriction appears to affect the ways in which freshmen obtain and consume alcohol. Wechsler et al. (2000) reported that underage college students drink alcohol on fewer occasions but when they do drink they tend to binge and to drink in less public settings (i.e., fraternity or off-campus parties rather than a public bar.) Harford, Wechsler, and Seibring (2002) found that 48.8% of freshmen attend fraternity parties, 50.9% attend off-campus bars, 54.8% attend dorm parties, and 76.5% attend off-campus parties.

One implication of the setting in which a student drinks is the relative cost of alcohol. Underage students also reported more often than their legally-aged peers that obtaining alcohol is cheap. Approximately 58% of underage students reported that they paid less than one dollar for a drink, did not pay anything, or paid one set price (i.e., a cover fee) for all they could drink as compared to 16% of students aged 21-23 (Wechsler, n.d.). The ability to obtain alcohol cheaply relates positively to increased amounts of binge drinking: Unlimited access or the low cost of alcohol reduces the student's restrictions to alcohol and increases the opportunity to drink heavily or in a risky manner.

### *Current Interventions*

The ability to obtain alcohol for little cost despite being underage is a special consideration of college freshmen. However, this phenomenon also provides insight into methods of intervention. Hingson et al. (2005) reviewed interventions designed to reduce

college drinking. They noted that for the most part, increases in the cost of alcohol reduce alcohol consumption and related consequences. Younger individuals who drink more heavily are more affected by the price of alcohol than older, heavier drinkers. The authors concluded that if the revenue generated by increased alcohol prices is then used for programs and existing policy enforcement, the reduction in underage drinking could exceed reductions evidenced in the increased cost of alcohol alone.

Despite the prevalence of underage drinking, Wagenaar and Toomey (as cited in Hingson et al., 2005) reported that the nationwide increase of the legal drinking age to 21 years has been “the most successful intervention to date in reducing drinking” (p. 270). Zero tolerance laws (e.g., laws prohibiting underage persons from driving after the consumption of any amount of alcohol) has also helped to reduce alcohol-related traffic deaths in individuals under 21. However, as Hingson et al. pointed out, raising the legal drinking age and zero tolerance laws, while effective, are often not enforced. Thus, it appears that effective methods of reducing negative alcohol consequences, specifically traffic deaths, among underage individuals exist, but must be more regularly enforced to increase effectiveness.

The research on interventions aimed particularly at freshman is limited. Although intervention studies often use freshmen as part of their sample, relatively few specifically target freshmen (Larimer & Cronce, 2002). As previously discussed, Marlatt et al. (1998) tested the effectiveness of the BASICS intervention in a sample of freshmen and found that students reported drinking less alcohol and drinking less frequently when compared to a no treatment group. Similarly, Baer et al. (2001) found reductions in alcohol-related negative consequences among students 4 years after receiving the

BASICS intervention as freshmen. However, in a review of the prevention and intervention literature for college student drinking, Larimer and Cronce identified only four outcome studies that exclusively sampled freshmen. Aside from the Marlatt and Baer studies, Larimer et al. (2001) was the only study to utilize a brief intervention. Larimer et al.'s study sampled freshmen pledges of Greek organizations, not merely freshmen in general. Of these identified studies, not only brief intervention, but also skills-training and peer-based normative reeducation interventions appeared effective at reducing risky alcohol use patterns and associated negative consequences. Larimer and Cronce concluded that while freshmen are an at-risk population among college student drinkers, they appear responsive to alcohol prevention programs, specifically those programs that are nonjudgmental, include normative reeducation, and emphasize skills and personal responsibility for change.

*Modifications of existing interventions – group feedback.* One proposed modification to existing interventions is to provide alcohol-related information (e.g., personalized feedback) in a group setting. McNally and Palfai (2003) investigated whether components of brief interventions could be administered to groups of at-risk drinkers. The researchers compared two intervention groups, actual-ideal (A-I) and self-norm (S-N), to an assessment only control group. The intervention groups differed on the methods used to enhance motivation to change. The A-I group focused on developing a discrepancy between the individual's current behaviors and their ideal behaviors. The S-N group focused on the discrepancy between an individual's behaviors as compared to their peers. They found a significant reduction in the frequency of heavy episodic

drinking for the S-N group and concluded that targeting normative misperceptions of peer alcohol use patterns may be a more effective technique in brief group interventions.

Neal and Carey (2004) found similar results. They randomly assigned 92 at-risk college students to one of three groups: a personalized normative feedback (PNF) group, a personal strivings assessment (PSA) group, and an attention control group. The PNF group was similar to McNally and Palfai's self-norm (S-N) group in that the feedback was constructed to elicit a discrepancy within the participant between self and others. The PSA group was similar to the actual-ideal (A-I) group in that the feedback was constructed to elicit a discrepancy between the participant's current and ideal self. Only the PNF group exhibited an increased level of discrepancy and increased intention to reduce alcohol use. However, the aim of this study was not to measure actual changes in alcohol use, only perceived discrepancy and intention toward behavior changes.

Micheal, Curtin, Kirkley, Jones, and Harris (2006) randomly assigned 91 students in freshman seminar programs (FSPs) to either a classroom based motivational interviewing (MI) session or an assessment control condition. The MI session included a decisional balance activity and discussion regarding perceived and normative college student drinking. Follow-up assessment occurred between 30 to 45 days after intervention. The average number of self-reported days spent drinking in the past 30 days did not differ significantly between groups, however, students in the MI session reported consuming 4.5 fewer drinks in the past 14 days as measured by the Timeline Followback. Students in the MI session also reported 1.5 fewer days of intoxication in the past 30 days. Alcohol-related problems did not differ significantly between groups. Thus, it appears that a classroom based intervention reduces the amount of alcohol

consumed and the frequency of intoxication when measured at a 4 to 6 week follow-up.

*Evaluations of group feedback.*

Walters (2000) compared the efficacy of mailed personalized feedback to a discussion group regarding personalized feedback and a no treatment control group. The mailed feedback group showed the greatest decrease in the number of drinks consumed per week (6.6 drinks/week less) compared to the group feedback session (0.35 drinks/week) and the no treatment control group (2.75 drinks/week). Although this study does not appear to provide support for the use of a group feedback session, the author noted the limitations of this study such as a small sample size, the potential exclusion of heavier drinking students, and lack of further follow-up data.

Miller and Rollnick (2002) also addressed the “perils and possibilities” with regard to group motivational interviewing. They cited data that suggested group feedback does not appear effective among heavy drinking college students. They also noted that given the complex nature of a group, there is more potential for diffusion of discrepancy, lack of participation, resistance, collective argumentation, and a limited amount of time to converse about the feedback.

Miller and Rollnick (2002) did not discount these potential barriers to effective group feedback. However, they suggested situations in which group motivational interviewing may be advantageous. For example, the interpersonal pressure reflected in a group may act to pull less interested or ready to change individuals into making a mutual public commitment to change. In addition, the presence of a group reinforces to individuals that they are not isolated and may act as a support system. Given the power of group diffusion, the individual may actually feel less threatened and exhibit less

resistant behaviors as compared to being confronted directly in a one-on-one therapy session. Finally, the authors noted that discrepancy promoting change may develop within an individual if he/she experiences other group members who voice opposition or negative response to change as compared to the empathetic, motivational message provided by the facilitator.

*Modifications of existing interventions - incorporate unique experiences.*

Additionally, alcohol prevention programs should incorporate aspects of the college experience unique to freshmen, for example, the freshmen orientation experience. Alcohol prevention programs should capitalize on these events as means to intervene with these populations. In fact, NIAAA reported that the first 6 weeks of college enrollment affect success of students' their freshmen year. NIAAA recommended that universities adopt a procedure such that incoming students and their parents are informed of the alcohol policy and penalties before arrival on campus and during orientation periods in order to prevent the development of alcohol-related problems during this "critical, high-risk period" (NIAAA, 2002). Given that Freshmen Seminar Programs (Michael et al., 2006) are often used to assist freshmen in transitioning to college life, it would appear that these courses would also provide an opportunity to intervene with freshmen and provide information about their alcohol use.

*Modifications of existing interventions - further investigate alcohol use patterns.*

Alcohol prevention programs often use normative data in an effort to reeducate college students about alcohol use patterns among their peers. However, these data are usually based on the general college student population. Thus, more research is needed to establish alcohol use norms specific to freshmen within their college. Individual colleges

and universities should identify the alcohol use patterns of their freshmen in order to provide personalized feedback and reeducation information specific to those students. This at-risk group may exhibit a cohesiveness, which in some settings may be an opportunity to express resistance to normative information, yet an asset if used strategically in prevention programs.

Finally, there is a need for more research, not only with regard to the components of brief interventions or modification of existing interventions, but also to investigate the effectiveness of BASICS with this special population. As noted, there are only three studies of the BASICS program with freshmen (Marlatt et al., 1998; Baer et al., 2001; Larimer et al., 2001), which indicates the paucity of randomized, controlled clinical outcome studies targeted at freshmen to reduce risky alcohol use behaviors.

### Conclusion

College student alcohol use continues to be a widely studied area since the original research of Straus and Bacon (1953). Binge drinking, in particular, has gained increased attention. Several nationwide studies indicate that approximately 40% of college students binge drink (e.g., O'Malley & Johnston, 2002). Related to this pattern of risky alcohol use, the negative consequences affect students academically, physically, and interpersonally.

Various intervention strategies have been utilized to reduce risky alcohol use among college students. However, the use of brief interventions, specifically the BASICS program (Dimeff et al., 1999) appears more efficacious than purely information-based approaches. Eight studies support the use of BASICS with a college student population, particularly with heavy-drinking students. Three of these studies (Marlatt et

al., 1998; Baer et al., 2001; Larimer et al., 2001) have investigated the use of BASICS with freshmen. However, more data are needed to understand better how to tailor such an individually-focused intervention to this special group.

Although initial research on the use of BASICS is promising, it is limited in terms of research specifically aimed at freshman. Future research could capitalize on recent research suggesting that BMI could be delivered to groups rather than individuals (e.g., in a Freshmen Seminar Program). Furthermore, such group based interventions could take advantage of features unique to freshmen, such as the use of freshman specific norms. In particular, the use of Freshmen Seminar Programs as a modality for intervention is consistent with recommendations to get alcohol information to freshmen students as quickly as possible.

#### The Current Study

The current study evaluated a modification of the BASICS program. Specifically, this study provided personalized feedback to college freshmen in a classroom-based group format. Freshmen were enrolled in Auburn University UNIV 1000 courses, a course that is designated to assist first-year students in orientation to college life. Fourteen classes were randomly assigned to one of two groups: a personalized feedback lecture ( $n = 7$ ) or a generic alcohol lecture ( $n = 7$ ). Participants in the personalized feedback lecture group received personalized feedback in similar format to that used in BASICS. Participants in the generic alcohol lecture received general information about alcohol use, such as the definition of a standard drink. The primary outcome variables included quantity and frequency of alcohol use, maximum amount of alcohol consumed

in one occasion, consequences related to alcohol use, rates of binge drinking, perceptions of peer alcohol use behaviors, and motivation to change alcohol-related behaviors.

The specific hypotheses of the study included:

1. Participants assigned to the personalized feedback lecture will report a lower frequency of alcohol consumption at follow-up than participants assigned to the generic lecture.
2. Participants assigned to the personalized feedback will report a lower quantity of alcohol consumption, as measured by maximum amount in one occasion and by total amount consumed over time, at follow-up than participants assigned to the generic lecture.
3. Participants assigned to the personalized feedback will report fewer episodes of binge drinking at follow-up than participants assigned to the generic lecture.
4. Participants assigned to the personalized feedback will report fewer alcohol-related negative consequences at follow-up than participants assigned to the generic lecture.
5. Participants assigned to the personalized feedback will report a more accurate perception of peer alcohol use at follow-up than participants assigned to the generic lecture.
6. Participants assigned to the personalized feedback will report a greater level of motivation to change their alcohol-related behaviors at follow-up than participants assigned to the generic lecture.

## METHODS

### *Participants*

Participants were Auburn University freshmen enrolled in 14 selected UNIV 1000 courses during the fall semester 2006. All students in these courses were invited to participate in the study. Parental consent was obtained for those students under 19 years of age. Approximately 350 students were enrolled in the 14 UNIV 1000 courses and recruited into the study, 244 turned in the initial assessment package, and 166 students completed the study. Participants were given 2 hours of extra credit toward their UNIV 1000 course as compensation for their participation.

### *Measures*

*Demographics Questionnaire.* The demographics questionnaire assessed the participants' gender, age, affiliation with a Greek organization, ethnic and racial identities, current residence, and high school GPA. The questionnaire also asked for participants' weight in order to calculate blood alcohol levels, and to verify their class standing as a freshman. These questions assessed group differences among participants based upon demographic variables.

*Daily Drinking Questionnaire.* The Daily Drinking Questionnaire (DDQ; Collins, Parks, & Marlatt, 1985) assessed the participants' average amount of alcohol consumption within the past month. The DDQ was modified from a longer measure, the Drinking Practices Questionnaire (DPQ; Calahan, Cisin, & Crossley, 1969). Convergent

validity between the two measures produced a coefficient of  $r(52) = .50$ . The DDQ was constructed as a 7-day calendar utilized to assess participants' alcohol use within the past 28 days. Participants completed this calendar with the typical number of standard drinks consumed each day and the typical amount of time spent drinking. Average weekly consumption was calculated by summing the number of standard drinks (one standard drink was equal to 12 oz. beer, 5 oz. wine, or 1.5 oz. hard liquor) across the number of drinking days reported by the participant. Research has supported the validity of self-reported drug use when participants' confidentiality is assured (Johnston & O'Malley, 1985)

In an open-ended question format, participants reported how often in the past 28 days they consumed any amount of alcohol, the largest amount of alcohol consumed in one occasion, and the hours spent drinking on that occasion. Participants also reported how often in the past month they consumed 5 or more drinks (4 or more for females) to assess binge drinking rates. Participants completed this measure at baseline and at follow-up.

*Rutgers Alcohol Problem Index.* The Rutgers Alcohol Problem Index (RAPI; White & Labouvie, 1989) assessed the participants' self-reported alcohol-related consequences within the past 28 days. The scale was designed for adolescents between the ages of 12 and 21, thus it is an appropriate measure for college students. Previous measures of internal consistency have been high ( $r = .92$ ; White & Labouvie, 1989); internal consistency was also high in the current study ( $r = .74$  at both baseline and follow-up). One month test-retest reliability was adequate in a college student sample ( $r = .72$ ; Borsari & Carey, 2000). The original RAPI measured the frequency of alcohol-

related problems occurring in the previous three months. For purposes of the current study, the RAPI was modified to measure problems during the previous 28 days.

Participants completed the RAPI at baseline and at follow-up. The scale consists of 23 items that assessed the frequency with which the participant experienced specific alcohol-related problems over the previous 28 days. Ratings are provided on a five-point Likert scale (0=never, 1=1-2 times, 2=3-5 times, 3=6-10 times, 4=more than 10 times). Sample items included: “Missed a day (or part of a day) of school or work; had a fight, argument, or bad feelings with a friend; and kept drinking when you promised yourself not to.”

*Readiness to Change Questionnaire (RTCQ).* The Readiness to Change Questionnaire (RTCQ; Rollnick, Heather, Gold, & Hall, 1992) is a 12-item survey designed to assess a subject’s willingness to change their alcohol-related behaviors, and whether the subject is aware of any alcohol-related problematic behaviors or not. The RTCQ asked the subject questions such as: “I enjoy my drinking but sometimes I drink too much,” “I am trying to drink less than I used to,” and “I don’t think I drink too much.” The RTCQ was based upon the Stages of Change Model (Prochaska & DiClemente, 1984; DiClemente, Prochaska, Fairhurst, Velicer, Velasquez, & Rossi, 1991) and incorporated three of the five stages of change. These stages included precontemplation, contemplation, and action.

Internal consistency for each of the three stages ranged from 0.73 to 0.85 in the original validation study, which indicated that the item scores within each of these stages can reasonably be regarded as constituting scales within the measure (Rollnick et al., 1992). Test-retest reliability scores were also satisfactory (ranging from 0.78-0.86). In

the current study, each scale was internally consistent at both baseline ( $r = .675$  precontemplation,  $r = .782$  contemplation,  $r = .688$  action) and follow-up ( $r = .689$  precontemplation,  $r = .805$  contemplation,  $r = .747$  action).

*Acceptability Survey.* The Acceptability Survey is similar to other subjective questionnaires of acceptability that have been used in studies evaluating brief interventions with college students (Murphy et al., 2001; Marlatt et al., 1998). It was modified to reflect the methodology of this study. The survey items asked participants to identify how interesting, relevant, and effective they believed the group feedback to be. Participants ranked their responses on a 10-point Likert scale (1 = *not at all effective, relevant* to 10 = *excellent, very effective relevant*).

*Alcohol Use Disorders Identification Test.* The Alcohol Use Disorders Identification Test (AUDIT) is a 10-item questionnaire that assesses risky alcohol use behaviors (Babor, de la Fuente, Saunders, & Grant, 1989). Survey items asked participants to identify the frequency and quantity of their alcohol use, including binge drinking episodes, about alcohol-related problems, and about symptoms associated with alcohol dependence. Construct validity ( $r = .84$ ) and reliability ( $r = .71$ ) were demonstrated to be moderate to high among a college student sample (Fleming, Barry, & MacDonald, 1991). Fleming et al. concluded that the use of the AUDIT may be appropriate for individuals or organizations serving college students, such as health clinics or prevention and education programs. Kokotailo et al. (2004) also concluded that the AUDIT is a valid instrument for use with college student populations. In the current study, the AUDIT displayed good internal consistency ( $r = .75$  at baseline and follow-up).

*Time and Money Allocation Questionnaires.* The Time and Money Allocation Questionnaires assists participants' in recalling how they spent their time over the past 7 days and how they spent their money over the past month. The Time Allocation Questionnaire provided an activity log to assist participants' in reconstructing their schedule in the past week along with 11 questions that asked participants to estimate how many hours they spent doing certain activities (e.g., in class, studying, exercising, drinking alcohol).

The Money Allocation Questionnaire provides a 7-day calendar and asked participants to estimate how much money he/she spent on alcohol each day, over the past month. The instructions specified that the participant should only include amounts of money spent directly on alcohol, not money spent on cover charges (unless the cover fee included drinks) or money spent on alcohol that others consume.

#### *Procedure*

*The First Week of Class.* Willing participants were provided with an Informed Consent Form (or a Parental Consent and Assent Form if applicable) and a survey regarding their alcohol use patterns. Participants returned the signed consent form and completed survey to a locked drop box in Thach Hall within two weeks of receipt of the packet. Completion of the packet took approximately 30 minutes.

*Subject Selection and Randomization.* All students who returned a signed consent form and completed survey within 2 weeks of receipt of the packet were included in the study. Each section of the UNIV 1000 course was randomly assigned to one of two groups, a personalized feedback lecture or a generic lecture.

*Personalized Feedback and Generic Lectures.* Both the personalized feedback and generic lectures were delivered during regularly scheduled class meetings. Personalized feedback forms were modeled after previous studies (Agostinelli et al., 1995; Walters, Bennett, & Miller, 2000) and the BASICS (Dimeff et al., 1999) program. Feedback forms included information about the estimated blood alcohol level (BAL) on typical and peak drinking occasions, self-reported negative consequences, weekly average number of standard drinks, gender-specific normative data, and the amount of time and money allocated to alcohol. Participants in this group also received information on how to reduce risky drinking behaviors. The feedback forms were presented to the students with only coded information on them, thus no identifying information was on the personalized forms. The personalized feedback lecture consisted of the Principal Investigator walking the students through the interpretation of their feedback and answering any questions. It should be clear that this lecture did not identify any one student's personalized feedback, but instead guided and assisted each student in interpreting their own personalized feedback forms. Students in the class who chose not to participate in the study did not receive personalized feedback forms, but were still exposed to beneficial lecture material (e.g., normative information, understanding BAL, risk of alcohol use). These students received a copy of the lecture slides, which prevented their identification as non-participants. Finally, the personalized lecture met the UNIV 1000 course requirements for alcohol education.

The generic lecture included information about the potential risks of alcohol use, definition of a standard drink, and the prevalence and consequences of alcohol use among college students. The generic lecture met the UNIV 1000 course requirements for

alcohol education. Delivery of the personalized feedback and generic lecture was approximately equal in length and conformed to the standard 50 minute lecture period.

*Follow Up Assessment.* A group follow-up session was conducted approximately 5 weeks after the personalized feedback lectures and generic lectures were administered. During the follow-up, the Principal Investigator returned to the UNIV 1000 courses and participants from both groups completed the same survey packet administered at the beginning of the semester, which assessed alcohol use since then. The survey was completed after class and participants returned it to the same drop box located in Thach Hall within 2 weeks of receipt of the survey packet. Completion of the packet took approximately 30 minutes. These data were used to compare the efficacy of generic lecture vs. personalized feedback lecture.

Throughout the study, participants had three face-to-face contacts with the Principal Investigator: at the beginning of the semester, during administration of feedback/lecture, and at the follow up assessment. The total time taken to participate in the survey-lecture-survey was approximately 2 hours. However, the 50 minute lecture was given during the participants' regularly scheduled class time, so the study only required approximately 1 hour outside of class to complete the survey packets.

#### *Data Analysis*

A variety of descriptive statistical techniques were employed to describe the sample. T-test and Chi-square techniques were used to insure that the two groups are comparable at the baseline assessment period. A series of mixed repeated measures ANOVAs were used to analyze the effects of the lecture (personalized vs. generic) from baseline to follow-up, with lecture group entered as a between group variable and time

entered as a within group variable. This series of ANOVAs was first conducted with the whole sample of participants, then by gender, and a third time for heavy drinking students only.

## RESULTS

The primary hypotheses were that the students who received the personalized feedback lecture would report a significantly greater decrease across alcohol-related variables at follow-up, as compared to students who received the generic feedback lecture.

Preliminary analyses confirmed that the two groups did not differ from one another on any of the key outcome variables assessed or on demographic variables. Table 1 summarizes the results.

### *Analyses of the Whole Sample*

#### *Alcohol Use and Alcohol-Related Problems.*

Repeated-measures analyses were conducted with the entire sample of participants (N = 166) to determine if there were reported changes in alcohol-related behavior from baseline and follow-up, and to determine if any changes varied as a function of the lecture condition. Table 2 shows these data. No significant main effects were found for the AUDIT score, total drinks consumed per week, most drinks consumed on one occasion, number of binge episodes, number of days out of the past 28 days on which alcohol was consumed, and number of alcohol-related consequences, indicating that student ratings were not influenced by time. No between subject effects or group by time interaction effects were found to be significant for any of the alcohol-related variables, indicating that the lecture condition did not influence student reports.

### *Perceived Norms.*

Repeated-measures analyses were also conducted with the entire sample of participants ( $N = 166$ ) to determine if there were reported changes in perceived peer alcohol use behaviors from baseline and follow-up, and to determine if any changes varied as a function of the lecture condition. No significant main effects were found for perceived peer quantity of alcohol consumed per occasion, indicating that student ratings were not influenced by time. There was a main effect of time on participants' ratings of perceived peer frequency of alcohol use [ $F(1, 164) = 9.63, p = .002$ ], such that participants in both groups reported lower perceived frequency at follow-up ( $M = 3.24, SD = 0.66$ ) relative to baseline ( $M = 3.45, SD = 0.75$ ). Mean ratings are on a Likert-type scale (1 = Once a month or less, 2 = Two to three times a month, 3 = One to two times a week, 4 = Three to four times a week, 5 = Nearly every day). No between subject effects or group by time interaction effects were found to be significant for either of the perceived peer alcohol use variables, indicating that the lecture condition did not influence student reports.

### *Stages of Change.*

Repeated-measures analyses were also conducted with the entire sample of participants ( $N = 166$ ) to determine if there were reported changes in the students' motivation to change their drinking behaviors from baseline and follow-up, and to determine if any changes varied as a function of the lecture condition. No significant main effects were found for the precontemplation stage, indicating that student ratings were not influenced by time. There was a main effect of time on participants' reported contemplation stage [ $F(1, 153) = 4.39, p = .038$ ], such that participants in both groups

reported a higher level of perceived commitment to considering a change in their alcohol related behaviors at follow-up ( $M = 8.61$ ,  $SD = 3.59$ ) relative to baseline ( $M = 8.03$ ,  $SD = 3.44$ ). There was a main effect of time on participants' reported action stage [ $F(1, 151) = 4.41$ ,  $p = .037$ ], such that participants in both groups reported a higher level of perceived commitment to actually changing their alcohol use behaviors at follow-up ( $M = 10.35$ ,  $SD = 3.76$ ) relative to baseline ( $M = 9.69$ ,  $SD = 3.49$ ). No between subject effects or group by time interaction effects were found to be significant for any of the stages of change variables, indicating that the lecture condition did not influence student reports.

#### *Analyses by Gender*

In light of the non-significant condition effects in the initial analyses, a set of follow-up analyses was conducted to determine if the results varied as a function of gender. Previous research indicated that the BASICS program may be more effective for female students than male students (Murphy et al., 2004). Thus, similar analyses were conducted on the gender subgroup of the entire sample to determine if there were changes from baseline to follow-up as a function of the lecture group. However, similar results were found as when the whole sample was analyzed.

#### *Alcohol Use and Alcohol-Related Problems.*

No significant main effects were found for the AUDIT score, total drinks consumed per week, most drinks consumed on one occasion, number of binge episodes, number of days out of the past 28 days on which alcohol was consumed, and number of alcohol-related consequences, indicating that student ratings were not influenced by time. No between subject effects or group by time interaction effects were found to be

significant for any of the alcohol-related variables, indicating that the lecture condition did not influence student reports.

*Perceived Norms.*

A significant main effect was found for both males and females on perceived peer quantity of alcohol consumed per occasion (Males:  $[F(1, 53) = 8.99, p=.004]$ ; Females:  $[F(1, 107) = 11.60, p=.001]$ ), indicating that males and females in both groups reported lower perceived quantity of peer alcohol use at follow-up (Males:  $M = 3.18, SD = 1.00$ ; Females:  $M = 2.30, SD = 0.74$ ) relative to baseline (Males:  $M = 3.56, SD = 1.15$ , Females:  $M = 2.62, SD = 0.92$ ). A significant main effect was also found for both males and females on perceived frequency of peer alcohol use (Males:  $[F(1, 53) = 5.30, p=.025]$ ; Females:  $[F(1, 109) = 4.66, p=.033]$ ), indicating that males and females in both groups reported lower perceived frequency of peer alcohol use at follow-up (Males:  $M = 3.38, SD = 0.71$ ; Females:  $M = 3.17, SD = 0.63$ ) relative to baseline (Males:  $M = 3.65, SD = 0.67$ ; Females,  $M = 3.35, SD = 0.77$ ). A group by time interaction effect was found to be significant for male students on their perception of peer quantity of alcohol use  $[F(1, 53) = 5.35, p=.025]$ . Both groups reported a lower frequency of perceived peer alcohol use at follow-up, but the male students in the personalized group reported a greater reduction in peer perception from baseline ( $M = 3.66, SD = 1.31$ ) to follow-up ( $M = 2.92, SD = 0.97$ ) as compared to the male students in the generic lecture group (baseline:  $M = 3.48, SD = 1.03$ ; follow-up:  $M = 3.39, SD = 0.99$ ). A between subject effect was found to be significant for female students on their perceived peer quantity of alcohol use  $[F(1, 107) = 18.20, p < .001]$ . Females in the generic lecture group (baseline:  $M = 2.85, SD = 0.96$ ; follow-up:  $2.59, SD = 0.66$ ) reported higher perceived

levels of the amount of peer alcohol use than the personalized lecture group (baseline:  $M = 2.40$ ,  $SD = 0.83$ ; follow-up:  $M = 2.02$ ,  $SD = 0.71$ ) across both time points. The two groups differed both at baseline and at follow-up indicating that there was no effect of the lecture condition upon female students' report of peer alcohol consumption.

#### *Stages of Change.*

The only significant main effect for any stage of change was found with the male students on the precontemplation stage [ $F(1, 50) = 14.68$ ,  $p < .001$ ], indicating that male students in both groups reported being more likely to consider changing their alcohol use behaviors at follow-up ( $M = 14.52$ ,  $SD = 3.23$ ) relative to baseline ( $M = 12.88$ ,  $SD = 3.65$ ). No between subject effects or group by time interaction effects were found to be significant for either gender on any of the stages of change variables, indicating that the lecture condition did not influence student reports.

#### *Analyses for Heavy Drinking Students*

Similar analyses were conducted on subgroups of the entire sample to determine if there were changes from baseline to follow-up as a function of the lecture group. The second subgroup of analyses was run for heavy drinking students (e.g., students who scored above a 7 on the AUDIT, thus indicating that they are at a moderate to high risk of experiencing alcohol-related problems or that they are already experiencing alcohol-related problems.) As with gender, previous research suggested that the BASICS program may be more effective for heavy drinking college students than for those students who abstain or drink lightly to moderately (Murphy et al., 2001). Similar results were found as when the whole sample was analyzed.

### *Alcohol Use and Alcohol-Related Problems.*

A significant main effect was found for the AUDIT [ $F(1, 57) = 4.73, p = .034$ ], indicating that heavy drinkers in both groups reported a lower AUDIT score (e.g., less risk for alcohol-related consequences) at follow-up ( $M = 11.29, SD = 3.97$ ) relative to baseline ( $M = 12.34, SD = 3.37$ ). A significant main effect was also found for the reported total number of drinks consumed per week [ $F(1, 57) = 7.45, p = .008$ ], indicating that heavy drinkers in both groups consumed fewer drinks per week at follow-up ( $M = 18.19, SD = 12.06$ ) relative to baseline ( $M = 21.86, SD = 13.80$ ). No significant main effects were found for the most drinks consumed on one occasion, number of binge episodes, and number of alcohol-related consequences, indicating that student ratings were not influenced by time. A between subject effect was found to be significant for the number of days out of the past 28 days on which alcohol was consumed [ $F(1, 57) = 4.11, p = .047$ ]. Heavy drinkers in the generic lecture group (baseline:  $M = 11.48, SD = 6.20$ ; follow-up:  $M = 9.13, SD = 3.98$ ) reported consuming alcohol more frequently in the past 28 days across both time points relative to the personalized lecture group (baseline:  $M = 8.29, SD = 5.12$ ; follow-up:  $M = 8.11, SD = 3.96$ ), even though drinkers in both groups reported a decrease in the frequency of their alcohol use relative to their respective baselines. The two groups differed both at baseline and at follow-up indicating that there was no effect of the lecture condition upon heavy drinking students' frequency of alcohol use in the past 28 days.

### *Perceived Norms.*

A significant main effect was found for heavy drinking college students on their perceived peer quantity of alcohol consumed per occasion [ $F(1, 57) = 13.95, p < .001$ ],

indicating that students in both groups reported a lower perceived quantity of their peers alcohol consumption at follow-up ( $M = 2.86$ ,  $SD = 1.14$ ) relative to baseline ( $M = 3.39$ ,  $SD = 1.07$ ). A significant main effect was found for heavy drinking college students on their perceived frequency of peer alcohol use [ $F(1, 57) = 4.91$ ,  $p = .031$ ] indicating that students in both groups reported a lower perceived frequency of how often their peers consumed alcohol at follow-up ( $M = 3.32$ ,  $SD = 0.63$ ) relative to baseline ( $M = 3.56$ ,  $SD = 0.70$ ). No between subject effects or group by time interaction effects were found to be significant for heavy drinking college students on either perceived peer quantity or frequency of alcohol use, indicating that the lecture condition did not influence students' report of peer alcohol use.

#### *Stages of Change.*

No significant main effects for any stage of change was found for heavy drinking college students, indicating that these students' reported stage of change regarding their alcohol use was not influenced by time. No between subject effects or group by time interaction effects were found to be significant for on any of the stages of change variables, indicating that the lecture condition did not influence student reports.

## DISCUSSION

College student alcohol use, in particular high-risk patterns of alcohol use and its associated consequences, has been an area of research interest for several decades, and has increasingly become a matter of public concern. A review of five nationwide studies with differing methodologies indicated that college students report rates of binge drinking that ranged from 39% (Monitoring the Future) to 48% (CORE). The negative consequences of college student binge drinking may include sexual aggression, contraction of sexually transmitted diseases, violence, car accidents and fatalities, destruction of properties, school attrition, or the development of an alcohol-related disorder (Knight et al., 2002).

The National Institute of Alcohol Abuse and Alcoholism (NIAAA) suggested the use of specific intervention techniques (i.e., brief intervention) as an effective method to target college students and reduce risky alcohol use behaviors (NIAAA, 2002). Brief interventions have become a viable alternative to more intensive treatment. They are more cost efficient and less time intensive, and have been more effective than no treatment and as effective as more intensive treatment (Bien et al., 1993). Dimeff et al. (1999) developed the Brief Alcohol Screening and Intervention for College Students (BASICS) program, which incorporates brief interventions and motivational components. The BASICS program is a brief intervention designed specifically for college student heavy drinkers and those students who have experienced or are at risk for experiencing

negative consequences related to alcohol use. The BASICS program is effective in reducing the rate of college student risky drinking behaviors by up to 40% (Baer et al., 1992) as well as negative alcohol-related consequences (Marlatt et al., 1998; Baer et al., 2001). In particular, BASICS appears especially effective for those college students who are heavy drinkers (Borsari & Carey, 2000; Murphy et al., 2001, Carey et al., 2006).

Freshmen college students are a particularly at-risk group for developing risky drinking behaviors and the associated consequences. In a 10-year longitudinal study of college students, O'Neill, Parra, and Sher (2001) reported that the highest rates of alcohol-related symptomatology occurred in the first year of college. Although there is good initial evidence with regard to the effectiveness of BASICS as a preventative intervention among freshmen, there have been no research efforts investigating how BASICS may be modified to intervene more effectively with this special college student population.

NIAAA recommended that universities adopt a procedure such that incoming students and their parents are informed of the alcohol policy and penalties before arrival on campus and during orientation periods in order to prevent the development of alcohol-related problems during this "critical, high-risk period" (NIAAA, 2002). Given that Freshmen Seminar Programs (Michael et al., 2006) are often used to assist freshmen in transitioning to college life, it would appear that these courses would also provide an opportunity to intervene with freshmen and provide information about their alcohol use. Therefore, one proposed modification to existing interventions is to provide alcohol-related information (e.g., personalized feedback) in a group setting. Perhaps the provision of brief interventions in such a format, such as to freshmen enrolled in

freshmen-oriented courses, could aid in the effectiveness of reducing risky alcohol use patterns and subsequent consequences.

The goal of the current study was to modify the BASICS program such that personalized feedback regarding alcohol use was delivered to a group of freshmen enrolled in a Freshmen Seminar Program. The control group received a generic lecture on alcohol use. The primary outcome variables included quantity and frequency of alcohol use, maximum amount of alcohol consumed in one occasion, consequences related to alcohol use, rates of binge drinking, perceptions of peer alcohol use behaviors, motivation to change alcohol-related behaviors, and perceived acceptability of the intervention. Our hypotheses were that students in the personalized lecture group would report a decrease in the quantity and frequency of alcohol use, binge drinking episodes, and alcohol related consequences, as well as a higher level of motivation to change their alcohol use behaviors and a more accurate perception of peer alcohol use. The data were analyzed by the whole sample, by gender, and with heavy drinking students only.

#### *Whole Sample*

There were no significant effects of the lecture group condition on students' reported levels of alcohol use, including measures of frequency and quantity, related consequences, binge episodes, and level of risk. Students' in both groups reported a lower perceived frequency of peer alcohol use at follow-up relative to baseline; however, these results did not appear to be a function of the lecture condition. Rather, these results may indicate a natural normalization process of perceived peer alcohol use - that is, as first semester freshmen acclimate to the college environment, their peer perceptions may change as the result of actually being a college student rather than a high school student

with misconceptions of college student alcohol use. This premise is similar to the alcohol expectancies theory (Christiansen & Goldman, 1983) discussed previously. However, the literature supports the stability of peer perceptions over a two month period (Neighbors, Dillard, Lewis, Bergstrom, & Neil, 2006). Thus, more research is needed to examine further the stability or change in peer perceptions as students' transition from high school to college.

Students in both groups reported higher levels of perceived commitment to considering a change in their drinking behaviors (contemplation stage) and actually changing their drinking behaviors (action stage) at follow-up relative to baseline. However, these results did not appear to be a function of the lecture condition. It may have been that both groups were equally effective in increasing problem recognition and commitment to change. Alternatively, the students' report of an increased likelihood of considering to change or of actually changing their alcohol use behaviors may also have been a function of their acclimation to the college environment. Perhaps as students gather more interpersonal data on the manner in which college students' use alcohol, this change in their peer perception also affects their personal stage of change or the manner in which they consider their own drinking behaviors. Cho (2006) studied heavy drinking college students and found that campus norms regarding alcohol frequency were significantly related to the precontemplation stage of students. Although these results are not exactly similar to those of this study, they support a relationship between peer perception and stages of change.

The lack of an effect of the lecture group on students' alcohol use behaviors and related consequences is contradictory to what was expected based upon the previous

literature. The BASICS program is effective in reducing the rate of college student risky drinking behaviors (Baer et al., 1992) as well as negative alcohol-related consequences (Marlatt et al., 1998; Baer et al., 2001). Reductions in alcohol use patterns remain up to a 2 year follow-up (Baer et al., 1992; Marlatt et al., 1998) and reductions in related negative consequences up to a 4 year follow-up (Baer et al., 2001). Initial BASICS research for freshmen students indicated that students reported drinking less alcohol and drinking less frequently when compared to a no treatment group (Marlatt et al., 1998) and reductions in alcohol-related negative consequences (Baer et al., 2001). In fact, providing personalized feedback alone reduces college student drinking (Agostinelli, Brown, & Miller, 1995) regardless if the feedback is disseminated via mail (Collins, Carey, & Sliwinski, 2002) or in-person but without a clinician-directed motivational interviewing component (Murphy et al., 2004). Furthermore, the use of freshmen seminar programs (FSPs) to deliver either a motivational interviewing (MI) session or an assessment control condition indicated that students who received the MI session reported a reduction in the number of drinks consumed and number of intoxicated days (Micheal et al., 2006) at follow-up relative to baseline. Thus, it appears that the BASICS program is an effective intervention, and there is precedent for a classroom-based BASICS intervention with freshmen. Strategies for making group interventions more effective are addressed below as future directions for research.

### *Gender*

There were no significant effects of the lecture group on males' or females' reported levels of alcohol use, including measures of frequency and quantity, related consequences, binge episodes, and level of risk. These results are contradictory to what

would be expected given the literature. Previous research indicated that the BASICS program may be more effective for female students than male students (Murphy et al., 2004). Additionally, a recent study investigated group-based personalized feedback with heavy drinking male freshmen (LaBrie, Pedersen, Lamb & Quinlan, 2007). LaBrie et al. reported that all participants reduced their alcohol use and alcohol-related consequences, but the males in the Frequent Binge Drinker category experienced the greatest reductions in the number of days spent drinking, total drinks consumed, and maximum number of drinks consumed.

Males and females in both groups reported a lower perceived frequency and quantity of peer alcohol use at follow-up relative to baseline although these results appeared to be a function of time rather than the lecture condition. As indicated earlier, these results may indicate a natural normalization process of perceived peer alcohol use as first semester freshmen acclimate to the college environment. A group by time interaction effect was also found for male students. Males in the personalized lecture group reported a greater reduction in perceived frequency of peer alcohol use than the males in the generic lecture group, thus indicating that this reduction in peer perceptions was a function of the lecture condition. A between-subjects effect was found for female students in their perception of peer quantity of alcohol use. Although females in the personalized lecture group reported lower perceived quantities of peer alcohol use as compared to females in the generic condition, these results are clouded by the fact that the females in the personalized group reported lower perceived peer alcohol use at both baseline and follow-up. Therefore, these results do not appear to be the effect of the lecture group.

Related to their motivation to change their alcohol use behaviors, there were no significant effects for female students in either group for any stage of change. Male students in both groups reported higher levels of perceived commitment to considering changing their drinking behaviors in the future (precontemplation stage) at follow-up relative to baseline. However, these results did not appear to be a function of the lecture condition. Similar to the analysis of the whole sample, both groups appeared equally effective in increasing problem recognition and commitment to change. Alternatively, the male students' report of an increased likelihood of considering changing their alcohol use behaviors may also have been a function of their acclimation to the college environment.

#### *Heavy Drinking Students*

A significant effect was found for heavy drinking students in both groups on the AUDIT score and the total number of drinks consumed per week. However, these results did not appear to be the function of the lecture group. A between-subjects effect was found for heavy drinking students on the number of days spent drinking. Although students in the personalized lecture group reported fewer days spent drinking as compared to students in the generic condition, this difference was reported at both baseline and follow-up. Therefore, these results do not appear to be the effect of the lecture group. Heavy drinking students in both groups reported lower levels of perceived peer frequency and quantity of alcohol use at follow-up relative to baseline. However, these results did not appear to be a function of the lecture condition. Similar to the analysis of the whole sample, these results may indicate that both groups experienced a natural normalization process of perceived peer alcohol use. Regarding students'

motivation to change their alcohol use behaviors, there were no significant effects for heavy drinking students in either group across any stage of change, contrary to the literature (Cho, 2006).

These results are also contradictory to what would be expected given the literature. Previous research indicated that the BASICS program may be more effective for heavy drinking students (Marlatt et al., 1998; Borsari & Carey, 2000; Murphy et al., 2001). Perhaps the heavy drinkers in both groups who reported fewer days spent drinking at follow-up were simply the result of these heavy drinkers regressing toward the mean.

#### *Limitations and Future Directions*

There are several limitations to this study. First, although the results indicate some changes in both groups from baseline to follow-up, there was no no-treatment control group. When the study was proposed and the freshmen seminar programs recruited for participation, approval of the study was contingent upon all students receiving some type of alcohol education (either personalized or generic) because such education was a preestablished course learning objective. Therefore, we did not have the option of forming a no-treatment control group. However, it is noted that the earlier BASICS studies discussed previously compared personalized feedback to more traditional educational interventions. Thus, our study was aimed at establishing the superiority of a personalized intervention over a control intervention in a group format.

Another limitation of the study may have been assessing students so early in their college careers. All data were collected prior to the Thanksgiving break during the fall semester. Although the BASICS program was designed for college students, perhaps

these first semester freshmen have not yet matured into a “college student” per say, but are still functioning more like high school students. It could be that the use of the BASICS program is more effective for students who have gained more perspective or had the “college experience” than for a freshmen sample of predominately 18-year-old individuals. This hypothesis is contradictory to the supporting evidence of the BASICS program with freshmen. However, it also may be consistent with the drinking trajectories of freshmen. In a longitudinal study of freshmen drinking patterns, Greenbaum, Del Boca, Darkes, Wang, and Goldman (2005) classified five types of drinking trajectories of freshmen: light-stable (53%), light-stable high holiday (9%), medium-increasing (8%), high-decreasing (20%), and heavy-stable (10%). These data indicate that 53% of freshmen students maintain a steady drinking pattern. Furthermore, the most frequent change in alcohol use occurs during holidays, a time period not assessed in this current study.

Alternatively, the lack of change in alcohol use behaviors may have been a result of the short follow-up period. Perhaps reassessing students at the end of their first semester did not give freshman enough time to settle into distinct drinking patterns, experience negative consequences, recognize a need to change, and then actually make changes in their alcohol use behaviors. Often a consequence of risky alcohol use is impairment in academic performance and it is noted that this study was completed prior to the students receiving their first semester grades. It is conceivable that this intervention would result in group differences if students were assessed at later time points in their college career.

Obviously, a major challenge and one of the primary goals of the study was the adaptation of the one-on-one BASICS program to a group, classroom-based setting. Miller and Rollnick (2002) cited data suggesting that group feedback does not appear effective among heavy drinking college students. The authors reviewed three early studies comparing the effectiveness of group feedback to mailed feedback among heavy drinking college students (Walters, Bennett & Miller, 2000; Walters, 2000; Martin, Noto & Walters, 2000). Results supported the use of mailed feedback over the use of group feedback. Miller and Rollnick noted that given the complex nature of a group, there is more potential for diffusion of discrepancy, lack of participation, resistance, collective argumentation, and a limited amount of time to converse about the feedback. Each of these potential pitfalls was anecdotally observed by the primary investigator during the lecture conditions of both groups. Students were often observed to share their personalized feedback with friends seated nearby, to converse and compare feedbacks, and to snicker, shrug, sleep or otherwise exhibit a behavioral referent that would indicate the students dismissed the feedback. Perhaps issues such as diffusion of discrepancy and lack of participation could account for the lack of significant findings in this study. It should also be noted that this “group” setting was in fact a classroom and not a therapeutic group setting. Perhaps group-based interventions would be more effective for therapeutic groups than groups of students in a classroom.

Despite their reservations, Miller and Rollnick (2002) suggested situations in which group motivational interviewing may be advantageous. For example, the interpersonal pressure reflected in a group may act to pull less interested or ready to change individuals into making a mutual public commitment to change. In addition, the

presence of a group reinforces that individuals are not isolated and the group may act as a support system. Given the power of group diffusion, the individual may actually feel less threatened and exhibit less resistant behaviors as compared to being confronted directly in a one-on-one therapy session. Finally, the authors noted that discrepancy promoting change may develop within an individual if he/she experiences other group members who voice opposition or negative response to change as compared to the empathetic, motivational message provided by the facilitator.

Given the concerns list above and the findings of the current study, additional suggestions regarding how to make group interventions more effective are discussed below. First, as previously noted, there is a distinct difference between a therapeutic group setting and a classroom group setting. Future research should examine the relative effectiveness of group interventions with these two different populations. Perhaps the lack of participation and discussion observed among participants in this study is a function of being in a classroom with fellow students whom they have only known approximately eight weeks. Students may not feel comfortable asking questions that would reveal their drinking patterns to a classroom of perceived strangers. A therapeutic group setting would offer smaller groups of people (e.g., 8-12 rather than a classroom of 25) and the bounds of confidentiality would be thoroughly discussed at the onset of the intervention. Second, in a therapeutic context, it is more acceptable to ask individuals to make a public commitment to change, thus strengthening their investment in the intervention. Given the nature of the classroom, this aspect of intervention was not included in the study, perhaps affording the participants more diffusion of responsibility. With regard to Miller and Rollnick's (2002) concern about "collective argumentation,"

this issue may be reduced in a therapeutic setting. Typically, the structure of group therapy allows the facilitator to adequately address collective resistance before moving on to other topics. However, in this study, the primary investigator was not able to suspend the provision of feedback in order to address thoroughly the negative reactions of a small sub-group of students. Although measures were taken to try to reduce resistance, given the methodology of the study, there was an inherent “breaking point” in which the investigator had to move on despite the apparent lack of acceptance among some students. These comments suggest that future research on the administration of personalized feedback in a group setting should not be abandoned, but more thoroughly investigated to understand which conditions and populations are best suited to a group-based feedback intervention.

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## APPENDIX

Table 1

*Demographics of the sample (N = 166)*

	Frequency
Gender	
Male	33.1%
Female	66.9%
Age	
17	3.0%
18	86.1%
19	10.8%
Mean (SD)	18.1 (0.4)
Greek Member	38.6%
Ethnicity	
Caucasian	88.6%
African American	10.8%
Asian American	1.8%
Residence	
Off Campus	44.0%
With Parents	1.8%
Greek Housing	1.8%
Dormitory	49.4%
Other	3.0%

Table 2

*Means (standard deviations) for alcohol-related behavior of the whole sample (N = 166) at baseline and follow-up*

	<u>Generic (n = 86)</u>		<u>Personalized (n = 80)</u>	
	Baseline	Follow-up	Baseline	Follow-up
<u>Self-Reported Alcohol Use</u>				
AUDIT score	5.77 (5.54)	6.16 (5.70)	5.97 (5.65)	6.00 (5.39)
Total Drinks/Week	10.01 (13.22)	9.60 (12.75)	9.34 (12.26)	8.00 (8.82)
Most Drinks/Occasion	4.83 (5.51)	5.21 (5.77)	4.96 (5.20)	4.61 (5.07)
Number of Binges	3.11 (4.96)	3.25 (4.95)	3.13 (4.47)	3.04 (4.47)
Past 28 Days	5.56 (6.50)	4.86 (5.14)	4.29 (4.83)	4.63 (4.86)
Consequences	3.16 (4.60)	4.30 (7.07)	3.27 (6.03)	3.23 (4.64)
<u>Perceived Peer Alcohol Use</u>				
Frequency of Use <sup>a</sup>	3.47 (0.73)	3.26 (0.62)	3.44 (0.78)	3.23 (0.71)
Quantity of Use	3.08 (1.03)	2.88 (0.88)	2.78 (1.15)	2.29 (0.89)
<u>Stages of Change</u>				
Precontemplation	13.73 (3.45)	14.33 (3.43)	14.13 (3.56)	13.94 (3.36)
Contemplation <sup>a</sup>	8.32 (3.51)	8.38 (3.62)	7.74 (3.36)	8.85 (3.57)
Action <sup>a</sup>	10.21 (3.80)	10.43 (3.54)	9.18 (3.10)	10.26 (4.01)

Note: a Significant main effects of time for participants in both groups from baseline to follow-up. All *ps* <.05

Table 3

Means (standard deviations) for alcohol-related behavior by gender (males: N = 55; females; N = 111) at baseline and follow-up

	<u>Generic</u>				<u>Personalized</u>			
	Baseline		Follow-up		Baseline		Follow-up	
	<u>Females</u> <u>Males</u>		<u>Females</u> <u>Males</u>		<u>Females</u> <u>Males</u>		<u>Females</u> _____ <u>Males</u>	
<u>Self-Reported Alcohol Use</u>								
Total Drinks/Week	6.92	15.5	6.73 (7.31)	14.71 (17.94)	6.61 (7.43)	15.71 (17.99)	6.12 (6.65)	12.40 (11.51)
AUDIT score	4.75 (4.95)	7.58 (6.11)	5.35 (5.06)	7.61 (6.52)	5.20 (5.09)	7.75 (6.56)	5.75 (5.40)	6.58 (5.42)
Most Drinks/Occasion	3.66 (4.16)	6.97 (6.96)	4.11 (3.97)	7.23 (7.79)	4.01 (4.07)	7.20 (6.79)	3.50 (3.55)	7.22 (6.95)
Number of Binges	2.25 (4.04)	4.55 (5.97)	2.38 (4.15)	4.70 (5.85)	2.61 (3.61)	4.48 (6.08)	2.64 (3.83)	4.10 (5.81)
Past 28 Days	4.41 (4.90)	7.60 (7.76)	4.56 (4.82)	5.39 (5.71)	3.77 (4.36)	5.50 (5.70)	4.30 (4.71)	5.40 (5.21)
Consequences	2.67 (4.11)	4.03 (5.31)	4.05 (7.69)	4.74 (5.89)	2.85 (4.87)	4.21 (8.11)	3.09 (4.72)	3.54 (4.52)
<u>Perceived Peer Alcohol Use</u>								
Frequency of Use <sup>a</sup>	3.40 (0.78)	3.58 (0.62)	3.22 (0.60)	3.32 (0.65)	3.30 (0.76)	3.75 (0.74)	3.13 (0.66)	3.46 (0.78)
Quantity of Use <sup>a</sup>	2.85 (0.96)	3.48 (1.03)	2.59 (0.65) <sup>c</sup>	3.39 (0.99)	2.40 (0.83)	3.67 (1.31)	2.02 (0.71) <sup>c</sup>	2.92 (0.97) <sup>b</sup>
<u>Stages of Change</u>								
Precontemplation	14.58 (3.26)	12.28 (3.33)	14.42 (3.55)	14.17 (3.25) <sup>a</sup>	14.33 (3.39)	13.65 (3.97)	13.51 (3.36)	14.96 (3.21) <sup>a</sup>
Contemplation	7.76 (3.24)	9.32 (3.78)	7.88 (3.69)	9.25 (3.40)	7.27 (2.95)	8.87 (4.04)	8.47 (3.67)	9.74 (3.22)
Action	9.83 (3.81)	10.86 (3.77)	10.13 (3.21)	10.96 (4.06)	8.81 (2.89)	10.04 (3.44)	9.83 (3.70)	11.26 (4.60)

Table 3 (continued)

*Means (standard deviations) for alcohol-related behavior by gender (males: N = 55; females; N = 111) at baseline and follow-up*

Note: a Significant main effect of time for participants in both groups from baseline to follow-up. All  $ps < .05$

b Significant group by time interaction for males in the personalized group from baseline to follow-up.  $p = .025$

c Significant between subject effect of females perception of peer quantity of alcohol use.  $p < .001$

Table 4

*Means (standard deviations) for alcohol-related behavior of heavy drinking students (N = 59) at baseline and follow-up*

	<u>Generic</u>		<u>Personalized</u>	
	Baseline	Follow-up	Baseline	Follow-up
<u>Self-Reported Alcohol Use</u>				
AUDIT score	12.23 (3.12)	11.52 (4.20) <sup>a</sup>	12.46 (3.68)	11.04 (3.77) <sup>a</sup>
Total Drinks/Week	22.98 (13.80)	20.50 (14.51) <sup>a</sup>	20.63 (13.94)	15.63 (8.10) <sup>a</sup>
Most Drinks/Occasion	9.88 (5.44)	10.48 (5.56)	10.58 (4.37)	8.89 (4.81)
Number of Binges	7.57 (5.51)	7.61 (5.07)	7.87 (4.63)	6.19 (5.37)
Past 28 Days	11.48 (6.20)	9.13 (3.98) <sup>b</sup>	8.29 (5.12)	8.11 (3.96) <sup>b</sup>
Consequences	7.06 (5.24)	8.39 (5.78)	7.78 (8.37)	6.48 (5.56)
<u>Perceived Peer Alcohol Use</u>				
Frequency of Use	3.55 (0.62)	3.32 (0.54) <sup>a</sup>	3.57 (0.79)	3.32 (0.73) <sup>a</sup>
Quantity of Use	3.32 (1.08)	3.06 (1.12) <sup>a</sup>	3.46 (1.07)	2.64 (1.13) <sup>a</sup>
<u>Stages of Change</u>				
Precontemplation	12.23 (2.64)	13.16 (2.99)	13.32 (2.75)	13.14 (2.88)
Contemplation	10.35 (2.95)	9.90 (3.38)	10.07 (3.44)	10.00 (3.57)
Action	10.94 (3.73)	10.42 (3.78)	9.32 (3.07)	9.96 (3.57)

Note: a Significant main effect of time for participants in both groups from baseline to follow-up. All  $p$ s < .05

b Significant between subjects effect of heavy drinkers alcohol use for the past 28 days.  $p < .05$