GENUINE VS. DRAFT-CS: A RANDOMIZED TRIAL COMPARING COMPUTER AND LIVE PERSONALIZED FEEDBACK INTERVENTIONS FOR HIGH-RISK DRINKING AMONG COLLEGE STUDENTS

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GENUINE VS. DRAFT-CS: A RANDOMIZED TRIAL

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INTERVENTIONS FOR

HIGH-RISK DRINKING AMONG COLLEGE

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Chapter I

Introduction

Epidemiology of Alcohol Use and Misuse by College Students

Alcohol misuse among college students is a continual problem that has been extensively documented. Though the prevalence of illicit drugs and tobacco use among the general public has declined since the 1980s, alcohol use among college students has remained relatively unchanged (Johnston et al., 2004). Added to this, in 2001, 44.4% of college students were classified as binge drinkers (Wechsler et al., 2002), where binge drinking is defined as five or more drinks for men and four or more drinks for women on a single occasion. Results from this same study also showed an overall increase in percentage of frequent binge drinking from 21.3% in 1993 to 23.5% in 2001, with this increase seen for both men and women. Research also shows an increase in the percentage of students (48.2%) who report that drinking "to get drunk" is an important reason for drinking (Wechsler et al., 2002). Moreover, almost 1,400 alcohol-related college student deaths and over 500,000 injuries were estimated to have occurred in 2001 (Hingson, Heeren, Winter, & Wechsler, 2005). Knight et al. (2002) reported that 31.6% of college students met criteria for alcohol abuse and 6.3% met criteria for alcohol dependence.

Further analysis of college drinking also shows that binge drinkers are at a greater risk for experiencing negative consequences related to their use of alcohol. These alcohol related problems include missing class, doing regrettable things, arguing with friends, engaging in unplanned and unprotected sex, damaging property, getting into trouble with police, getting hurt/injured, requiring medical treatment because of an overdose, and drinking while driving

(Wechsler et al., 2002). In 2001, over 20% of college students reported having five or more of the above alcohol-related problems (Wechsler et al., 2002). Finally, problems of alcohol misuse also extend to other students not engaged in the misuse of alcohol, such as being verbally assaulted or humiliated, being physically assaulted, having their studying and sleep interrupted, experiencing an unwanted sexual advance, and being a victim of a sexual assault or date rape (Wechsler et al., 2002). Fifty-five percent of abstainers and non-binge drinkers reported experiencing two or more of these secondhand effects of binge drinking (Wechsler et al., 2002).

Prevention Efforts to Curb College Drinking

Although many college students will mature out of their heavy drinking and alcohol problems on their own and without treatment by the time they leave college (Jackson, Sher, Gotham, & Wood, 2001), they are still extremely vulnerable to many alcohol-related consequences during their college years (Marlatt et al., 1998). In response to the growing problem, colleges and universities have implemented a variety of primary prevention strategies to curb alcohol use: 97% of colleges and universities provide alcohol education programs; 98% impart restrictions on the supply of alcohol (e.g., no alcohol allowed on campus, no kegs allowed on campus, etc.); 90% restrict advertising of alcohol on campus or at campus activities; and 62% provide alcohol-free dormitories and living spaces (Wechsler et al., 2000). Research indicates, however, that these programs provide only limited change in alcohol-related knowledge and attitudes and very little to no change in college student drinking (Gonzalez, 1991; Moskowitz, 1989).

Another less utilized approach to curbing college drinking is through secondary (or targeted/indicated) prevention programs. Recent research has suggested that indicated prevention efforts are more effective than primary prevention efforts at reducing college drinking behaviors

(Walters & Bennett, 2000). These programs target college students who are already misusing alcohol and are, therefore, at high-risk for many different alcohol-related problems. High-risk students can be identified through law enforcement, a doctor's visit, or through screeners. Miller, Sovereign, and Krege (1988) reported that reasons for heavy drinkers not seeking treatment in the past was not due to ignorance of or a lack of confidence in treatment options but because they felt that they did not have a serious problem. As such, screener use is a vital component in increasing help-seeking behavior in unidentified heavy drinkers who may not realize that they are at high-risk for alcohol-related problems.

Three types of secondary prevention interventions with high-risk college drinkers have been studied: (1) interventions including intensive cognitive-behavioral skills training (Baer, Marlatt, Kivlahan, Fromme, Larimer, & Williams, 1992; Kivlahan, Marlatt, Fromme, Coppel, &Williams, 1990); (2) interventions that utilize some form of a motivational interview with personalized feedback (Baer, Kivlahan, Blume, McKnight, & Marlatt, 2001; Borsari & Carey, 2000; Larimer et al., 2001; Marlatt et al., 1998; Murphy et al., 2001); and (3) interventions including either written (White et al., 2006), mailed (Agostinelli, Brown, & Miller, 1995; Collins, Carey, & Sliwinski, 2002; Walters, Bennett, & Miller, 2000) or computerized personalized feedback (Leffingwell et al., 2007; Neighbors, Larimer, & Lewis, 2004; Neighbors, Lewis, Bergstrom, & Larimer, 2006).

Despite the strong empirical support for skills training and motivational interviews with feedback interventions, colleges and universities have been slow to provide these interventions to their students because of several practical barriers (Larimer et al., 2007). The use of these types of interventions requires increased resources, staffing, training, and supervision that many campuses may not have or be able to afford (Larimer, Kilmer, & Lee, 2005). However,

personalized feedback alone without motivational interviewing may provide an answer to this obstacle. Personalized feedback interventions (PFIs) are quick, economical, and have been shown to be as efficacious as or more efficacious than in-person group or individual interventions (Walters & Neighbors, 2005; White et al., 2006).

Recent PFI research has investigated the use of computer-based PFIs. Computer-based PFIs capitalize on the effective ingredients of assessment and personalized feedback and also serve to further streamline the process by creating an all inclusive package with no need for mailing feedback. Computerized normative feedback received the highest level of interest from among over 1,200 current drinkers when given a choice of a computerized normative feedback, a self-help book, or a telephone call from a therapist (Koski-Jännes & Cunningham, 2001). Compared to paper-and-pencil questionnaires, computer-based programs have also been shown to increase the amount of self-disclosure regarding sensitive areas, such as excessive alcohol use (Turner, Ku, Rogers, Lindberg, Pleck, & Sonenstein, 1998). In addition, recent research has demonstrated that computer-based feedback interventions significantly reduced alcohol consumption at 3- and 6-month follow-up assessments (Leffingwel et al., 2007; Neighbors, Larimer, & Lewis, 2004; Neighbors, Lewis, Bergstrom, & Larimer, 2006). These three studies, however, only provided a no-intervention comparison group. As such, computer-based PFIs have yet to be compared to a more intensive intervention.

Present Study

The use of an effective and self-contained computer-based PFI would be an important step in creating a more cost-effective and streamlined approach towards curtailing high-risk college drinking. Therefore, the present study was designed to replicate and extend prior work on computer-based PFIs by comparing a computer-based PFI to an in-person PFI, repeated

assessment condition, and an assessment only control group in their capacity to reduce heavy-drinking college students' quantity and frequency of alcohol use along with alcohol-related problems. As such, a computer-based PFI can be subjected to a more rigorous comparison and to another sample of heavy drinking college students. If the computer-based PFI is found to be as or more effective than the in-person PFI, it will further validate its usage as a successful intervention.

Chapter II

Literature Review

Alcohol Misuse by College Students

The misuse of alcohol by college students is a extensively documented problem. Almost 45% of college students were classified as binge drinkers in 2001 (Wechsler et al., 2002). Added to this, it is estimated that 31.6% of college students met criteria for alcohol abuse and 6.3% met criteria for alcohol dependence (Knight et al., 2002). Regarding dependence, this means that slightly more than 1 out of every 16 college students has a diagnosis of alcohol dependence (Knight et al., 2002). Recent data also indicates that there is a move toward polarization of drinking behavior, with a 3% increase (16% to 19%) in college student abstention from alcohol between 1993 and 2001, and a 3% increase (20% to 23%) in college student engagement in frequent binge drinking between that same time period (Wechsler et al., 2002). Students were considered frequent binge drinkers if they had binged 3 or more times in the past 2 weeks and considered abstainers if they had not consumed alcohol in the past 12 months.

With an increase in the misuse of alcohol, an increase in alcohol-related problems has also occurred. Between 1993 and 2001, Wechsler and colleagues (2002) observed a 1.9% increase (4.6% to 6.5%) in students having trouble with the police and a 3.5% increase (9.3% to 12.8%) in the number of students getting hurt or injured, among those who consumed alcohol in the past 30 days. Moreover, compared to students who drank but did not binge, occasional and frequent binge drinkers were more likely to experience alcohol-related problems such as missing class (29.9%), arguing with friends (22.5%), engaging in unplanned and unprotected sex

(21.6%), damaging property (10.8%), requiring medical treatment because of an overdose (0.6%), and drinking while driving (28.8%) (Wechsler, Lee, Kuo, & Lee, 2000).

The problems of binge drinking do not just impact the binge drinker; the effects of binge drinking also extend to other individuals in the college community. Fifty-five percent of abstainers and non-binge drinkers reported experiencing two or more secondhand effects of binge drinking (Wechsler et al., 2002). These secondhand effects include being insulted or humiliated (29.2%), being physically assaulted (8.7%), having their studying and sleep interrupted (60%), having to take care of a drunken student (47.6%), experiencing an unwanted sexual advance (19.5%), and being a victim of a sexual assault or date rape (1%). Moreover, almost 2,000 alcohol-related college student deaths were estimated to have occurred in 2001 (Hingson et al., 2005).

With the persistent misuse of alcohol by students and its associated problems, it is imperative that effective prevention and intervention efforts take place. In addition, with research indicating that only a small portion of alcohol dependent students (6.2%) seek treatment (Knight et al., 2002), colleges should look to put screening strategies in place that will allow for the identification of high-risk drinking college students.

Barriers to Effective Prevention and Intervention

Many barriers to effective prevention and intervention efforts for high-risk college drinkers exist besides lack of financial resources on behalf of post-secondary institutions. Three general categories of prevention/intervention barriers have been described by Dimeff, Baer, Kivlahan, and Marlatt (1999), including institutional, personal, and conceptual barriers. Institutional barriers include the view that providing harm-reduction messages to underage students will only serve to increase the likelihood that these students will drink. Individuals and

groups who assert this view argue that it is only through abstinence only programs that underage students should be informed about the risks of alcohol use. Personal barriers to preventive intervention include the lack of insight that many heavy-drinking college students have regarding the riskiness of their misuse of alcohol. Very few heavy-drinking college students view their drinking as problematic or abnormally excessive (Dimeff et al., 1999). As such, this imperceptiveness results in few students seeking treatment for their problems with alcohol. Finally, conceptual barriers to preventive intervention include the differences in opinion between substance abuse treatment providers regarding a disease model versus a biopsychosocial model of substance abuse. Proponents of disease model approaches (e.g., Twelve-step programs) do not provide for any gray area with regard to problem drinking; that is, problem drinkers are either abstinent or are alcoholics. On the other hand, advocates of a biopsychosocial perspective consider there to be different levels of problem drinking, each requiring a different level of intervention as indicated by a "stepped-care" and "treatment matching" approach (Institute of Medicine, 1990).

Given these barriers and the problems they cause for the dissemination of effective alcohol prevention/intervention efforts, it is imperative that, in order to overcome these barriers, a preventive intervention need demonstrate the following: (1) after intervention, no significant increase in alcohol use by underage abstinent students occurs when compared to matched controls; (2) increases heavy-drinking college students' awareness of their risky drinking and possibly the likelihood that they will seek treatment; and (3) proves to be as clinically effective as more intensive interventions (e.g., Twelve-Step programs) while also being more time and cost-effective.

Primary Prevention

Though primary prevention efforts have shown little to no effect in changing college student drinking behavior, they are still widely used on college and university campuses. In their review of the outcome literature from 1984 to 1999, Larimer and Cronce (2002) identified three types of primary prevention strategies that have been utilized and evaluated with college students including: (1) information/knowledge-based programs; (2) values clarification/decision-making based programs; and (3) normative reeducation programs.

Information/knowledge-based programs. The theory behind information-based approaches follows that students' misuse alcohol because of a lack of knowledge of the health and social problems that can arise due to the misuse of alcohol. As such, educating students about the risks of alcohol use will serve to increase the likelihood that they will not use or will mitigate their use. Several studies have evaluated these approaches (Darkes & Goldman, 1993; Flynn & Brown, 1991; Garvin, Alcorn, & Faulkner, 1990; Kivlahan, Marlatt, Fromme, Coppel, & Williams, 1990; Meier, 1988; Roush & DeBlassie, 1989, Schall, Kemeny, Maltzman, 1991), with only Kivlahan et al. (1990) finding significant reductions in alcohol use and related problems with the use of an 8-week alcohol information intervention when compared to an assessment only control group. This 8-week intervention covered the following themes in a primarily lecture-based format: (1) dispelling myths about alcohol, (2) bodily and behavioral effects of alcohol, (3) effects of other drugs and their interactions with alcohol, (4) the alcohol industry, (5) alcoholism, (6) alcoholism and the family, (7) alcohol and the law, and (8) responsible decision making about alcohol (Kivlahan et al., 1990). It should be noted, however, that a cognitive-behavioral skills-based program (i.e., the Alcohol Skills Training Program) reduced student drinking to a greater extent than the information-based intervention, however,

this difference did not reach significance, due to only modest statistical power. Overall, information-based approaches to the reduction of college drinking has shown little efficacy.

Values clarification/decision-making based programs. The values/decision-making model attempts to reduce the misuse of alcohol by helping students better understand their values and the role that alcohol serves in fulfilling or not fulfilling these values. In their evaluation of five studies (Barnett, Far, Mauss, & Miller, 1996; Meacci, 1990; Sammon, Smith, Cooper, & Furnish, 1991; Schroeder & Prentice, 1998; Thompson, 1996) utilizing a values clarification condition, Larimer and Cronce (2002) concluded that although two of the studies reported reductions in drinking rates, lack of information provided regarding participants, procedures, and control conditions make the conclusions drawn suspect. Furthermore, the remaining studies showed a lack of evidence that would support the use of values clarification programs.

Normative reeducation programs. Festinger's (1957) theory of cognitive dissonance serves as the basis for normative reeducation programs. That is, the human tendency to bring inconsistent cognitions in-line with each other. These programs educate college students, in a mixed didactic/question-and-answer session, about the tendency for students to exaggerate college drinking norms. As such, once students are reeducated as to their misperceptions of college drinking, their drinking behavior will be reduced to closer approximate the norms. One study investigating the effects of this approach found significant changes in their perception of college drinking norms but not in drinking behavior (Barnett, Far, Mauss, & Miller, 1996) while another study (Schroeder & Prentice, 1998) found significant reductions in drinking but not in accuracy of normative perceptions. Further, Barnett et al. (1996) did not use random assignment to conditions and Schroeder and Prentice (1998) lacked a comparison group. These factors greatly limit the conclusions that can be drawn from both of these studies. However, normative

reeducation efforts to reduce college drinking may hold promise and should be more rigorously evaluated.

Overall, though primary prevention programs are widely used by colleges and universities, a majority of studies evaluating their efficacy have found little to no reduction in their ability to reduce alcohol consumption and/or alcohol-related consequences. Recent research, however, has suggested that secondary/indicated prevention efforts are effective at reducing college drinking behaviors (Walters & Bennett, 2000).

Secondary/Indicated Prevention

Recent research has suggested that secondary/indicated prevention efforts are more effective than primary prevention efforts at reducing college drinking behaviors (Walters & Bennett, 2000). These programs target college students who are already misusing alcohol and are, therefore, at high-risk for many different alcohol-related problems. Three main types of secondary approaches used with a college student sample have been studied including: (1) cognitive-behavioral skills-based approaches; (2) motivational interview with personalized feedback approaches; and (3) personalized feedback only approaches.

Cognitive-behavioral skills-based approach. A relatively more extensive approach to the reduction of college drinking is through the use of cognitive-behavioral skills-based approaches. These approaches range from single-component strategies, such as expectancy challenge interventions and self-monitoring/self-assessment procedures, to more comprehensive multi-component strategies like the Alcohol Skills Training Program (ASTP).

Expectancy challenge interventions work to identify alcohol-related expectancies of college students and then to challenge the students' inappropriate attributions of the pleasurable effects of alcohol use to the alcohol, itself, rather than to the setting in which they are drinking

the alcohol (Darkes & Goldman, 1993). Two studies assessing the efficacy of this type of intervention has indicated moderate effects in reducing alcohol consumption in the short-term for heavy drinkers (Darkes & Goldman, 1993, 1998).

Darkes and Goldman (1993) randomly assigned 74 heavy-drinking males to either an expectancy challenge group, a traditional alcohol information group, or to an assessment only group. For the first two sessions, participants in the expectancy challenge group were randomly assigned to drink either alcohol or a placebo in a social setting that included a social (playing Win, Lose, or Draw) or a sexual component (rating level of attractiveness of a model in a magazine). Following this interaction, participants guessed as to which participants they believed consumed the alcoholic beverage and who consumed the placebo based on their behavior. Participants also guessed as to the content of their own beverage. Participants were also asked to identify the specific behaviors that led to their conclusions. The third and final session provided a discussion of the two previous sessions and reviewed expectancy concepts and how they play a role in drinking behavior. Results demonstrated that participants in the expectancy challenge group significantly decreased their drinking relative to the other two groups (i.e., alcohol education and assessment only control group) at two-week post-treatment follow-up (Darkes & Goldman, 1993). Similar results were also found in Darkes and Goldman (1998) study, with significant reductions in alcohol consumption evidenced for two different expectancy challenge conditions (i.e., sociability component and arousal component) compared to an assessment only control group at two-week post-treatment follow-up.

Though further research in the area of expectancy challenge interventions needs to be conducted, especially studies utilizing both male and female participants and longer-term follow-

up, the results from these two studies do suggest that alcohol-related expectancies are likely to be useful in the reduction of alcohol consumption in college students.

Another example of a single-component cognitive-behavioral skills-based approach is self-monitoring interventions. Two studies (Cronin, 1996; Garvin, Alcorn, & Faulkner, 1990) in this area have shown significant reductions in alcohol consumption and related problems.

Cronin (1996) compared alcohol consumption and alcohol-related problems experienced over spring break between 128 students randomly assigned to one of two groups. In the first group, students completed a diary discussing anticipated alcohol consumption and alcohol-related problems over the spring break period; the second group was a no-treatment control. Results indicated that participants in the diary condition consumed significantly less alcohol and had fewer problems over spring break compared to controls (Cronin, 1996).

In another study investigating the efficacy of self-monitoring, Garvin, Alcorn, and Faulkner (1990) compared 60 fraternity members assigned to either a behavioral self-management condition, alcohol education condition, self-monitoring of drinking behavior condition, or a no-treatment control condition. Participants in the self-monitoring condition recorded their daily alcohol consumption for seven weeks. Results indicated that at five month follow-up, participants in the self-monitoring condition significantly lowered their alcohol consumption compared to the other conditions (Garvin, Alcorn, & Faulkner, 1990).

The Alcohol Skills Training Program (ASTP, Kivlahan et al., 1990) is an example of a multi-component, cognitive-behavioral skills-based intervention. The ASTP is an intervention for high-risk drinkers that attempts to increase participants' self-control, responsible decision-making, and coping skills (Kivlahan et al., 1990). This classroom-based intervention spans eight sessions incorporating themes, such as training in estimation of blood-alcohol level, setting

limits, antecedents of heavy drinking, assertiveness training and drink refusal skills, alcohol-related expectancy challenges, and relapse prevention (Kivlahan et al., 1990). The efficacy of the ASTP has been investigated in two relatively recent studies (Baer, Marlatt, Kivlahan, Fromme, Larimer, & Williams, 1992; Kivlahan et al., 1990).

In a randomized test of the ASTP, 43 participants were assigned to (1) the ASTP, (2) an alcohol information condition discussing the hazards of alcohol consumption, or (3) an assessment only control group. Participants' drinking behaviors were assessed at pre- and post-treatment and at 4, 8, and 12 months following the intervention. Results indicated that participants in the ASTP condition lowered their drinks per week and per month and lowered their monitored peak blood alcohol level per drinking occasion; however, due to low sample size, these results did not reach significance (Kivlahan et al., 1990).

In a follow-up to the above study, Baer et al. (1992) compared drinking rates reassessed at post-treatment and at 3, 6, 12, and 24 months between heavy drinkers who were randomly assigned to one of three different formats that incorporated ASTP content: (1) six 90-minute weekly classroom meetings, (2) a six-unit self-help manual, or (3) a one hour individualized feedback and advice session incorporated in a motivational interview. The self-help manual group was not included in the analysis due to lack of retention across follow-ups. Results indicated that a single, one hour session of feedback and advice incorporating the ASTP content was as effective as six 90-minute weekly classroom meetings covering ASTP content.

Overall, cognitive-behavioral skills-based approaches have demonstrated the ability to effectively reduce college drinking. This ability has been shown in both single-component and multi-component skills-based approaches. However, these interventions tend to be as efficacious

as brief interventions incorporating a motivational interview with personalized feedback but are more extensive and expensive to conduct.

Motivational interview with personalized feedback approach. Brief interventions have shown to be more effective at reducing alcohol consumption and problems compared to no-treatment control groups, and as effective as more extensive skills-based interventions (Bien, Miller, & Tonigan, 1993). Brief interventions for college drinkers take on a variety of forms, however, common ingredients of effective brief interventions generally includes the following: (1) an emphasis on the drinkers responsibility for change; (2) advice to change; (3) an amplification of the client's perceived dissonance between ideal and current drinking behavior through the use of assessment and personalized feedback; (4) building of client's self-esteem and self-efficacy; (5) an accepting and empathetic therapeutic style; and (6) a menu of treatment options (Miller, Sovereign, & Krege, 1988; Miller & Rollnick, 1991).

These ingredients were brought together in a new intervention called Motivational Interviewing (MI, Miller & Rollnick, 1991). Motivational Interviewing is described as a "client-centered, directive method for enhancing clients' intrinsic motivation to change by exploring and resolving ambivalence" (Miller & Rollnick, 2002, p. 25). This is accomplished through the use of specific therapeutic communication strategies, personalized feedback, and an accepting and empathetic communication style. Miller, Sovereign, and Krege (1988) initially studied this MI approach with adult problem drinkers through the use of the Drinker's Check-up (DCU). The DCU included an initial two hour assessment of the participant's current drinking practices followed by a return visit, within one week, for feedback of the findings. With a sample of 42 heavy-drinkers receiving the DCU, Miller and colleagues saw modest reductions in alcohol consumption and increased help-seeking behavior.

Following the DCU, many alcohol prevention researchers initiated studies of motivational interventions with feedback. Several of these studies (Baer, Kivlahan, Blume, McKnight, & Marlatt, 2001; Larimer et al., 2001; Marlatt et al., 1998; Murphy et al., 2001) have utilized a program specifically designed for college student drinkers called BASICS (*Brief Alcohol Screening and Intervention with College Students*; Dimeff, Baer, Kivlahan, & Marlatt, 1999). The BASICS approach involves feedback information about personal consumption, perceived norms, alcohol-related problems, and other risk factors. In addition, it includes an in-person meeting to discuss what a student wants from drinking, setting drinking limits, monitoring drinking behavior, and managing the situation in which drinking occurs (Walters & Neighbors, 2005).

In the first investigation of the efficacy of the BASICS program, Marlatt et al. (1998) randomly assigned 348 high-risk drinking college students to either an individualized motivational brief intervention (i.e., BASICS) or to an assessment only control group. One year after the initial individualized feedback intervention, BASICS participants were mailed additional feedback regarding their reports of drinking at baseline and at 6 and 12 month follow-ups. Results indicated that at 6, 12, and 24 month follow-up, students in the BASICS condition significantly reduced their consumption of alcohol and consequences associated with alcohol use compared to those students in the assessment only control group.

In a replication and extension of Marlatt et al. (1998), Murphy et al. (2001) randomly assigned heavy drinking college students to a single BASICS session, an education intervention discussing the negative consequences of alcohol abuse, or an assessment only control group. Results indicated that among the heaviest drinking participants, the participants in the BASICS condition significantly reduced their alcohol consumption at three month follow-up but not at

nine month follow-up compared to those in the education intervention and the assessment-only control.

Assessing the long-term effects of the BASICS program, Baer et al. (2001) randomly assigned 348 high-risk drinkers to either a single BASICS session or an assessment-only control group. Those randomly assigned to the intervention were also mailed personalized feedback graphs, with baseline, spring of freshman year, and fall of the second year results of their assessed drinking and its consequences compared to the norms of their college peers. Results of the study indicated that over four years, the largest changes were seen in reductions of alcohol consequences, followed by drinking quantity, and then drinking frequency. All three reductions were significantly greater than the reductions seen in the assessment-only control group.

The BASICS program was also implemented with first-year members of sororities and fraternities in a study by Larimer and colleagues (2001). The 296 participants were randomly assigned (within fraternity/sorority house) to either the BASICS condition or an assessment only control condition. Fraternity members significantly reduced their weekly drinking (15.42 to 12.27) and their peak blood alcohol concentrations (.12% to .08%) at one year follow-up. Sorority members in both conditions reduced their drinking with no significant differences evidenced between groups, although this result may be due to a lower sample size (Larimer et al., 2001).

In an adapted BASICS style intervention, Borsari and Carey (2000) compared alcohol consumption and alcohol-related problems reassessed at 6-weeks post-treatment between heavy drinkers who were randomly assigned to either an adapted BASICS intervention or an assessment-only control group. Unlike the above BASICS studies, this adapted BASICS intervention focused less on skills-based content and resembled more of a traditional

motivational interview (Walters & Neighbors, 2005). The results of this study indicated that at 6-week post-treatment, the intervention group significantly reduced their drinks per week and frequency of binge drinking in the month prior; however, no significant decrease was evidenced regarding a reduction in drinking problems.

Finally, in an attempt to use computer technology to facilitate the BASICS intervention, Dimeff and McNeely (2000) created an interactive computer-based intervention called the Multi-Media Assessment of Student Health (MMASH). The MMASH provided an assessment of alcohol consumption and produced printed graphical normative feedback that would be reviewed by the student with the help of a primary care practitioner at a student health center. Forty-one students were randomly assigned to receive MMASH or treatment-as-usual. Results indicated that participants involved in the MMASH condition showed a significant decrease in the reported number of binge drinking episodes and alcohol problems at 30-day follow-up.

Overall, motivational interventions with personalized feedback, as an indicated prevention effort, have demonstrated an ability to effectively reduce drinking and its negative consequences (Larimer & Cronce, 2002; Walters & Neighors, 2005). However, due to a lack of college and university resources, their implementation as a first line prevention effort has been slow. In an effort to solve this problem and to gain perspective as to the "active ingredients" of previously studied indicated preventions, researchers have compared the efficacy of personalized feedback alone in the reduction of alcohol consumption and consequences.

Personalized feedback only approach. In response to the appeal from campuses seeking cost-effective universal prevention strategies (Institute of Medicine, 1994) and researchers' questions regarding the active components of brief interventions, college drinking researchers began to evaluate the efficacy of personalized feedback without the use of an in-person

motivational interview. As a result, studies have been conducted evaluating the efficacy of in-person (Murphy et al., 2004), written (White et al., 2006), mailed (Agostinelli, Brown, & Miller, 1995; S. E. Collins, Carey, & Sliwinski, 2002; Walters, Bennett, & Miller, 2000), and computerized personal feedback (Leffingwell et al., 2007; Neighbors, Larimer, & Lewis, 2004; Neighbors, Lewis, Bergstrom, & Larimer, 2006) to reduce drinking and alcohol-related problems, with each new study attempting to maximize effectiveness and minimize time and cost.

In an attempt to evaluate the efficacy of personalized feedback alone in reducing college drinking, Agostinelli, Brown, and Miller (1995) randomly assigned 26 heavy-drinking college students to either receive or not receive, by return mail, personal feedback of their drinking compared to population norms. No in-person contact was made between the researchers and the participants in either condition. Participants in the feedback condition significantly decreased their average weekly drinks from an average of 16.4 to 8.5 and their average weekly peak blood alcohol concentration from 105.6 mg% to 55.7 mg% at six week post-test. The control group, on the other hand, showed no significant decreases in either average weekly drinks (10.6 to 10.1) or average weekly blood alcohol concentration (53.0 mg% to 52.5 mg%). Though this study had some significant limitations regarding differences between groups on many of the pre-treatment measures, it still provided a catalyst for future research in this area. Furthermore, a follow-up study (Collins, Carey, & Sliwinski, 2002) comparing a mailed-feedback intervention to an attention-control group (participants received a psychoeducational brochure by mail) demonstrated significant reductions in alcohol consumption at six week post-test in the mailed-feedback group compared to the control group.

Building on this research, Walters, Bennett, and Miller (2000) compared 37 moderate to heavy-drinking college students reassessed at six weeks post-treatment who were randomly assigned to one of three groups: (1) a two-hour class that provided educational, attitudinal, and skills-based techniques to encourage responsible drinking and decision making and mailed feedback; (2) mailed feedback only group; or (3) an assessment-only control group. Results indicated that the feedback only group significantly decreased their number of drinks per month compared to controls while the class plus feedback group did not significantly reduce their monthly consumption compared to controls. Unexpectedly, it appeared as though the addition of the classroom portion seemed to detract from the feedback. Walters and colleagues hypothesized that these results may be due to participants in the class condition not reading their feedback since they had already taken part in the alcohol class, and that the participants in the feedback only condition were more interested in their feedback since they had received nothing but the mailed feedback.

In an effort to compare personalized feedback alone to increasingly more effective interventions, Murphy et al. (2004) compared 54 heavy-drinking college students randomly assigned to receive either personalized feedback during a motivational interview or personalized feedback only. Participants in the feedback only condition were given a printout of their feedback and were told to review the feedback report for at least 30 minutes, while participants in the feedback plus motivational interview condition reviewed their feedback with a clinician during a brief MI session. Both intervention groups demonstrated significant reductions in number of drinks, frequency of drinking episodes, and heavy drinking episodes per week at six month follow-up; however, the groups did not significantly differ from each other in these areas. Though this study lacked an assessment-only control group, previous studies have demonstrated

the superior efficacy of brief interventions to control groups (Larimer & Cronce, 2002). Furthermore, a recent study (White et al., 2006) comparing college drug users receiving either personalized feedback during a motivational interview or personalized feedback only, demonstrated that both interventions significantly reduced students' consumption of alcohol, cigarettes, and marijuana. Both groups also showed reductions in alcohol- and drug-related problems. However, no significant differences were found between intervention groups in these areas.

Computer-based PFIs have also been a part of the recent college drinking literature. Computer-based interventions capitalize on the effectiveness of assessment and personalized feedback and also serve to further streamline the process by creating an all inclusive package with no need for mailing feedback. Furthermore, in a study by Koski-Jännes and Cunningham (2001), computerized normative feedback received the highest level of interest from among current drinkers. Two recent studies (Neighbors, Larimer, & Lewis, 2004; Neighbors, Lewis, Bergstrom, & Larimer, 2006) have investigated the efficacy of personalized normative feedback delivered through a computer.

Neighbors, Larimer, and Lewis (2004) randomly assigned 252 heavy-drinking college students to either a computer-based PFI condition or an assessment-only control condition and reassessed participants at 3- and 6-months post-treatment. In the intervention condition, participants received normative feedback immediately after completing baseline assessment questionnaires. Next, participants briefly viewed the feedback on a computer screen as it was being printed, and were then given the printed report to take with them. Results indicated that the computer-based PFI condition significantly reduced their alcohol consumption at both 3- and 6-month follow-up assessments compared to the assessment-only control condition. These results

were later replicated at 2-months post-treatment with 217 heavy-drinking college freshman and sophomores randomly assigned to receive a computer-based PFI or assessment only (Neighbors, Lewis, Bergstrom, & Larimer, 2006).

Finally, in an attempt to further streamline computer-based PFIs, Leffingwell et al. (2007) developed the Drinking Assessment and Feedback Tool for College Students (DrAFT-CS). The DrAFT-CS is an interactive multimedia program that provides drinking assessment and feedback to participants and was designed to simulate the BASICS program with the help of a video interviewer who presents instructions regarding assessment material and interpretive information during feedback. Unlike the earlier computer-based PFI interventions (Neighbors, Larimer, & Lewis, 2004; Neighbors, Lewis, Bergstrom, & Larimer, 2006), the DrAFT-CS does not provide a print-out of feedback results. All feedback is presented through charts and graphs on the screen and interpreted with the help of the video interviewer. The DrAFT-CS is extremely cost-effective, requiring only the program disc and a computer, and it is also brief, typically lasting only 45 minutes; it does not require a trained therapist to interpret or explain the feedback and provides the user with instant feedback following assessment.

In the first randomized trial evaluating the efficacy of the DrAFT-CS intervention, 85 heavy-drinking college students were randomly assigned to either the DrAFT-CS or an assessment-only condition. Participants were reassessed at 1, 4, and 6 month follow-up. Results indicated that for the DrAFT-CS condition, a significant reduction in monthly alcohol consumption was evidenced at all three follow-up time points, with no significant reductions seen for the assessment-only condition. Furthermore, students generally reported that they found the DrAFT-CS intervention to be well-organized, non-confrontational, and thorough.

Overall, PFIs in mailed, written, and computerized form have been shown to be as efficacious as or more efficacious than in-person brief interventions (Murphy et al., 2004; Walters & Neighbors, 2005; White et al., 2006). Moreover, recent computer-based PFIs serve to further streamline the process by creating an all inclusive package that is more easily accessible to a wider audience while remaining cost-effective. The DrAFT-CS has attempted to further advance computer-based PFIs by incorporating a video interviewer to provide instructions for assessment materials and interpretation of feedback. However, the efficacy of computer-based PFIs has not yet been compared to in-person based PFIs. Therefore, this will be the purpose of the present study.

Chapter III

Present Study

The purpose of the present study is to replicate and extend prior work examining the efficacy of computer-based PFIs. Attempts by colleges and universities to curb high-risk drinking through the use of universal prevention efforts have been largely ineffective (Gonzalez, 1991; Moskowitz, 1989). However, recent research in the area of indicated interventions has found promising results (Walters & Bennett, 2000). Both cognitive-behavioral skills-based interventions and brief interventions, in the form of a motivational interview plus personalized normative feedback and personalized-feedback alone, have shown to be effective in reducing alcohol consumption and its consequences (Larimer & Cronce, 2002; Neighbors, Larimer, Lostutter, & Woods, 2006). With colleges and universities interested in cost-effectiveness and ease of dissemination, brief interventions in the form of personalized normative feedback alone appear to be the most sensible approach. Recent personalized normative feedback research has investigated the use of computer-based PFIs. The use of an effective and self-contained computer-based PFI would be another step in creating a more economical and streamlined approach towards curtailing high-risk college drinking. Recent computer-based-PFI studies (Neighbors, Larimer, & Lewis, 2004; Neighbors, Lewis, Bergstrom, & Larimer, 2006), however, have only provided an assessment-only comparison group. Therefore, the present study was designed to replicate and extend prior work on computer-based PFIs (specifically, the DrAFT-CS) by comparing the DrAFT-CS to an in-person PFI, a repeated assessment, and an assessment

only control group in its capacity to reduce heavy-drinking college students' quantity and frequency of alcohol use along with alcohol-related problems.

Hypothesis 1. Participants in the DrAFT-CS condition will report significantly greater reductions in alcohol consumption and related problems than those seen in the repeated assessment and assessment-only control conditions but not significantly different than those seen in the in-person PFI condition.

Hypothesis 2. Participants in the DrAFT-CS condition and in-person PFI condition will significantly reduce their drinking (quantity and frequency) and its consequences from pretreatment to 10-week follow-up.

Hypothesis 3. Participants in the DrAFT-CS and in-person PFI conditions will find the intervention helpful, organized, non-confrontational, and thorough.

Chapter IV

Methods

Participant Recruitment and Selection

Participants were recruited through the SONA research web-site and identified by answering "yes" to the following question: "In the last month, have you consumed 5 or more drinks (if you are a male) or 4 or more drinks (if you are a female) on a single occasion?" Identified participants were sent an e-mail requesting their participation in the study and a phone number at which they could be contacted. Students who replied were contacted by phone and screened to see if they met inclusion criteria. Specifically, inclusion criteria were as follows: (a) current enrollment as a college student, (b) between 18 and 25 years of age, (c) reported at least one high drinking episode (five or more drinks on one occasion for males, four or more for females) in the last month, (d) reported drinking at least 20 drinks per month on average, and (e) reported at least one associated negative consequence of that use in the last month. Further, students were excluded from participating if they were (a) currently in treatment for alcohol abuse or dependence or (b) currently in treatment for a psychological or emotional disorder. Students who met inclusion criteria were randomly assigned to one of the four conditions and were scheduled a time to come into the lab and complete baseline assessment and specific condition procedures.

One-hundred and fifty-two undergraduate students from Oklahoma State University were recruited and completed the baseline assessment and intervention procedures **(**n = 39 in DrAFT-CS, n = 37 in in-person PFI, n = 37 in repeated assessment, and n = 39 in assessment-only

control), with 144 participants completing the 10-week follow-up assessment (94.7% retention); however, two of these participants' assessment data was removed from analyses due to random answer giving, leaving 142 participants **(**n = 37 in DrAFT-CS, n = 34 in in-person PFI, n = 34 in repeated assessment, and n = 37 in assessment-only control) in the final analyses (see Table A1 for the participant flow diagram and Table A2 for the demographic characteristics of the participants).

Baseline and 10-week Follow-up Assessment

Participants completed, via in-lab computers, a questionnaire (see Appendix D) which included six measures assessing demographic information, drinking quantities and frequencies (using items adapted from the *Daily Drinking Questionnaire* and *Frequency-Quantity Questionnaire*), drinking-related problems (*Brief-Young Adult Alcohol Consequences Questionnaire*), and intervention satisfaction (*Program Satisfaction Questionnaire*). This questionnaire took approximately 15 to 20 minutes to complete. The scores from these measures were used as the baseline measures for the analyses. With the exception of the *Program Satisfaction Questionnaire*, the questionnaire was completed again 10 weeks post-treatment, and the scores were used as follow-up measures for the analyses.

Demographics Questionnaire. Information regarding gender, age, ethnicity, Greek status (fraternity/sorority association), living situation, and year in school were gathered using the demographics questionnaire (See Table A1 for the demographic characteristics of the participants).

Daily Drinking Questionnaire (DDQ). The participants' typical pattern of alcohol use on each day for the past week was assessed using the DDQ (Collins, Parks, & Marlatt, 1985). Participants reported both the total number of standard drinks consumed and duration of a typical

drinking occasion (in hours) for each day of the week. From this information, the participants' total number of drinks and typical and peak blood alcohol concentrations were assessed (BAC; see Appendix D for Widmark's formula used to calculate BAC). The DDQ is a shortened version of the Drinking Practices Questionnaire (DPQ; Cahalan, Cisin, & Crossley, 1969), which was developed to measure volume, quantity, and frequency of alcohol consumption (Collins, Park, & Marlatt, 1985). Collins, Park, and Marlatt (1985) assessed the convergent validity of the DDQ and the DPQ; they were found to be significantly correlated (r = .50).

Frequency-Quantity Questionnaire (FQQ). The participants' practice of using alcohol was assessed using the FQQ (adapted from Cahalan & Cisin, 1968 and reported in Dimeff, Baer, Kivlahan, and Marlatt, 1999). The FQQ consists of four questions assessing highest quantity of alcohol consumed on a single occasion in the past month, typical quantity for a weekend evening, frequency of drinking over the past month, and number of occasions of drinking to get drunk.

Brief-Young Adult Alcohol Consequences Questionnaire (B-YAACQ). Alcohol consequences were assessed using the B-YAACQ (Kahler, Strong, & Read, 2005). The B-YAACQ is a 24-item measure, in which the participant is presented questions in a dichotomous response format that cover: (1) social-interpersonal consequences, (2) impaired control, (3) self-perception, (4) self-care, (5) risk behaviors, (6) academic occupational consequences, (7) excessive drinking, and (8) physiological dependence. It scores range from 0 to 24, with a score of 10 indicating that the participant is likely experiencing some important consequences of their drinking and a score of 15 indicating the likelihood of alcohol abuse or dependence (Kahler, Strong, & Read, 2005). The B-YAACQ has shown very high internal consistency with a Cronbach's α of 0.83 (Kahler et al., 2005), with similar internal consistency found in the present

study at both baseline (Cronbach's α = 0.84) and follow-up (Cronbach's α = 0.91). The B-YAACQ has strong convergent validity with other reliable and valid measures, such as the Rutgers Alcohol Problem Index (RAPI; White & Labouvie, 1989, r = .78). The B-YAACQ is sensitive for differing levels of severity and has been controlled for effects of gender (Kahler, Strong, & Read, 2005).

Program Satisfaction Questionnaire (PSQ). Level of satisfaction with both the DrAFT-CS and the in-person PFI interventions was assessed using the PSQ (adapted from Marlatt, Baer, Kivlahan, Dimeff, Larimer, Quigly, Somers, & Williams, 1998). The PSQ is a 9-item questionnaire with two open-ended questions (i.e., "What did you find most useful about the program?" and "What did you find least useful about the program?") and seven Likert scale questions assessing level of agreement or disagreement (i.e., strongly disagree, disagree, uncertain, agree, strongly agree) with statements such as "I would recommend this program/interview to a friend" and "The program/interview was non-confrontational." PSQ scores range can range from -2 to 2, with a score of -2 indicating "strongly disagree" and scores of 2 indicating "strongly agree."

Treatment Procedures

Participants were randomly assigned to one of four conditions: (1) an assessment-only control condition, (2) a repeated assessment condition, (3) an in-person PFI condition, or (4) the DrAFT-CS condition.

Assessment-only control condition (AO). Participants in this condition completed both baseline and 10-week follow-up computer-based questionnaires.

Repeated assessment condition (RA). Participants in this condition completed baseline and 10-week follow-up computer-based questionnaires, but also completed the assessment that

was used to provide feedback in both the in-person PFI and DrAFT-CS condition. This assessment included measures of quantity and frequency of drinking (using items adapted from the *Daily Drinking Questionnaire* and *Frequency-Quantity Questionnaire*), common problems experienced by college drinkers (*Rutgers Alcohol Problem Norms Rating Form*), levels of alcohol dependence (*Alcohol Dependence Scale*), perceptions of drinking norms (*Drinking Norms Rating Form*), perceptions of alcohol-related risk (*Alcohol Perceived Risks Problems*), overall levels of psychological distress (*Brief Symptom Inventory*), and motivation for change in drinking behaviors (*Readiness to Change Questionnaire*). The RA condition served as a comparison condition that would demonstrate any possible effect that additional assessment may have on both the in-person PFI and DrAFT-CS conditions who received one more additional assessment than the AO condition.

In-person PFI group and the DrAFT-CS condition. Participants in these conditions completed baseline and 10-week follow-up computer-based questionnaires, but also completed the additional assessment (outlined previously) and were provided feedback regarding their assessment in an accepting and empathic manner consistent with the BASICS intervention. This additional assessment took approximately 40 minutes to complete and allowed feedback to be provided in many areas including quantity and frequency of use, typical and peak blood alcohol levels achieved on drinking occasions, perceptions of social norms, dependence criteria, alcohol-related problems experienced, financial and caloric costs of alcohol use, familial risk for alcohol problems, perceptions of risk, alcohol expectancies, psychological problems, such as depression and anxiety, that may exacerbate or contribute to alcohol abuse, and motivation for changing current alcohol use. Though both groups received feedback regarding their assessments, the in-person PFI group received this feedback live with a BASICS trained therapist, while participants

in the DrAFT-CS condition received feedback through the use of a multimedia electronic interviewer. In addition, participants in the in-person condition were allowed to take home their feedback report (see Appendix C for an example copy of a personalized feedback report).

Therapist Training and Treatment Fidelity

The in-person PFI group received feedback regarding their assessment from a BASICS trained, master's level therapist. The therapist was trained over a two-day BASICS course and his feedback was recorded and monitored throughout the study to ensure that BASICS protocol was consistently followed.

Chapter V

Results

Randomization Check & Preliminary Analysis

Chi-square analyses were conducted to test for any significant condition differences with regard to gender [$\chi^2(3) = 3.575$, $p = .311$], ethnicity [$\chi^2(18) = 17.926$, $p = .461$], current living situation [$\chi^2(21) = 13.674$, $p = .883$], year of school [$\chi^2(9) = 7.906$, $p = .544$], and Greek affiliation [$\chi^2(6) = 2.895$, $p = .822$], with no significant differences found. One-way analysis of variance (ANOVA) tests were conducted to determine if significant condition differences existed with regard to baseline quantity/frequency and drinking related problems (means and standard deviations of both pretreatment and follow-up measures are provided in Table A3), revealing no significant differences ($p > .05$) between groups at baseline assessment.

For the primary analyses, a more liberal alpha of 0.10 was used to account for the four group design and the relatively small N ($\leq$ 39 participants per group), which greatly reduced statistical power for the observed small to moderate effect sizes (Table A4 lists the *post hoc* observed power of each mixed design ANOVA).

Primary Analyses

Hypothesis 1 & 2. Mixed design ANOVA tests with Condition (in-person PFI, DrAFT-CS, RA, and AO) as the between-subjects factor and Time (baseline and 10-week follow-up) as the within-subjects factor were conducted on all eight dependent variables followed by planned interaction contrasts on significant Condition by Time interactions to determine if alcohol consumption and related problem reductions evidenced in the DrAFT-CS and in-person PFI

conditions were significantly different from each other and the RA and AO conditions (See Table A4 for mean baseline to follow-up difference scores and mixed design ANOVA analyses for all conditions on each of the eight dependent variables; See Figure 1, 2, and 3 for mean baseline to follow-up difference scores for all conditions on each of the eight dependent variables).

Mixed design ANOVA tests showed a significant Condition by Time interaction for total number of drinks consumed in the previous week [$F(3,136) = 2.72$, $p = .047$, $\eta^2 = .057$], highest quantity of alcohol consumption on a single occasion in the past month [$F(3,138) = 2.70$, $p = .048$, $\eta^2 = .055$], typical BAC during previous week [$F(3,136) = 3.37$, $p = .020$, $\eta^2 = .069$], and peak BAC during previous week [$F(3,135) = 4.90$, $p = .003$, $\eta^2 = .098$]. No other Condition by Time interactions were significant with all *p's* > .10.

Planned interaction contrasts were conducted on all significant interactions. Interaction contrasts indicated that participants in the in-person PFI condition significantly reduced their total number of drinks during the previous week compared to participants in both the RA [$F(1,136) = 3.41$, $p = .067$, $\eta^2 = .024$] and AO conditions [$F(1,136) = 7.80$, $p = .006$, $\eta^2 = .054$]. Regarding the highest quantity of alcohol consumed on a single occasion during the past month, participants in the in-person PFI condition significantly reduced their quantity compared to those in both the RA [$F(1,138) = 3.10$, $p = .080$, $\eta^2 = .022$] and AO conditions [$F(1,138) = 7.90$, $p = .006$, $\eta^2 = .054$]. Interaction contrasts also indicated that participants in the in-person PFI condition significantly reduced their typical BAC during the previous week compared to participants in both the RA [$F(1,136) = 6.43$, $p = .012$, $\eta^2 = .045$] and AO conditions [$F(1,136) = 8.03$, $p = .005$, $\eta^2 = .056$]. Finally, participants in the in-person PFI condition significantly reduced their peak BAC compared to participants in the DrAFT-CS [$F(1,135) = 3.99$, $p = .048$,

η^2 = .029], RA [F(1,135) = 9.57, p = .002, η^2 = .066], and AO conditions [F(1,135) = 12.32, p = .001, η^2 = .084].

Though the DrAFT-CS condition did not demonstrate statistically significant reductions compared to the other conditions from baseline to follow-up at the $p < .10$ level, planned interaction contrasts did indicate that they were trending in this manner. The DrAFT-CS condition performed non-significantly better than the AO condition regarding total drinks consumed [F(1,136) = 2.22, p = .138, η^2 = .016], highest drinking occasion during the previous month [F(1,138) = 2.06, p = .154, η^2 = .015], typical BAC [F(1,136) = 2.55, p = .112, η^2 = .018], and peak BAC [F(1,135) = 2.35, p = .127, η^2 = .017]. In addition, though no significant overall Condition by Time interaction was demonstrated for typical quantity of alcohol consumed on a weekend evening, planned interaction contrasts demonstrated that the DrAFT-CS condition did reduce their typical quantity of alcohol consumed on a weekend evening significantly more than the AO condition [F(1,138) = 4.26, p = .041, η^2 = .030].

Simple comparisons were conducted for both the DrAFT-CS and the in-person PFI conditions to assess whether participants in both conditions significantly reduced their drinking (quantity and frequency) and its consequences from pretreatment to 10-week follow-up. For participants in the DrAFT-CS condition, results indicated a significant decrease from pretreatment to follow-up in total number of drinks consumed during the previous week [F(1,136) = 2.91, p = .090, η^2 = .021], average blood alcohol concentration during identified drinking occasions in the previous week [F(1,136) = 7.66, p = .006, η^2 = .053], peak blood alcohol concentration during highest identified drinking occasion in the previous week [F(1,135) = 7.04, p = .009, η^2 = .050], highest quantity of alcohol consumption on a single occasion in the past month [F(1,138) = 7.35, p = .008, η^2 = .051], typical quantity of alcohol consumed on a

weekend evening [$F(1,138) = 2.82$, $p = .095$, $\eta^2 = .020$], and in alcohol-related consequences [$F(1,134) = 8.94$, $p = .003$, $\eta^2 = .063$]. However, no significant differences were found for frequency of drinking over the past month [$F(1,134) = 1.44$, $p = .232$, $\eta^2 = .010$] or the number of occasions spent drinking to get drunk [$F(1,134) = 1.48$, $p = .225$, $\eta^2 = .011$].

Similar to the DrAFT-CS condition, participants in the in-person PFI condition, significantly decreased from pretreatment to follow-up in total number of drinks consumed during the previous week [$F(1,136) = 12.20$, $p = .001$, $\eta^2 = .082$], average blood alcohol concentration during identified drinking occasions in the previous week [$F(1,136) = 19.15$, $p < .001$, $\eta^2 = .123$], peak blood alcohol concentration during highest identified drinking occasion in the previous week [$F(1,135) = 28.14$, $p < .001$, $\eta^2 = .173$], highest quantity of alcohol consumption on a single occasion in the past month [$F(1,138) = 20.68$, $p < .001$, $\eta^2 = .130$], and in alcohol-related consequences [$F(1,134) = 9.10$, $p = .003$, $\eta^2 = .064$]. However, no significant differences were found for typical quantity of alcohol consumed on a weekend evening [$F(1,138) = 1.00$, $p = .319$, $\eta^2 = .007$], frequency of drinking over the past month [$F(1,138) = 1.05$, $p = .307$, $\eta^2 = .008$], or the number of occasions spent drinking to get drunk [$F(1,137) = 0.20$, $p = .652$, $\eta^2 = .001$].

It should also be mentioned that the RA condition also evidenced significant reductions from baseline to follow-up in both highest quantity of alcohol consumption on a single occasion in the past month [$F(1,138) = 4.23$, $p = .042$, $\eta^2 = .030$] and in alcohol-related consequences [$F(1,134) = 13.01$, $p < .001$, $\eta^2 = .089$].

Hypothesis 3. Seven independent samples *t*-tests comparing PSQ scores between the in-person PFI and DrAFT-CS conditions were conducted to determine whether differences occurred in each intervention's ability to be helpful, organized, non-confrontational, and thorough. Means

and standard deviations by group for each question are presented in Table A5. Analyses indicated that Average PSQ score was not significantly different between conditions [$t(72) = 1.18$, $p = .243$], indicating no significant differences between conditions for overall intervention satisfaction. However, item six on the PSQ ("The program did not impose a particular choice about alcohol upon me.") showed a significant difference [$t(61) = 2.35$, $p = .022$] between the in-person PFI ($M = 1.32$, $SD = 0.709$) and the DrAFT-CS ($M = 0.81$, $SD = 1.126$). Degrees of freedom were reduced for the above independent samples *t*-test due to significant unequal variances [$F = 6.53$, $p = .013$]. No other significant PSQ item differences were found between groups ($p > .05$). Comparisons of mean PSQ item scores for both the in-person PFI and DrAFT-CS condition are presented in Table A5.

Chapter VI

Discussion

The purpose of the present study was to replicate and extend prior work investigating the effectiveness of computer-based PFIs. Specifically, the study compared the DrAFT-CS to an in-person PFI, a repeated assessment, and an assessment only control condition in its capacity to reduce heavy-drinking college students' quantity and frequency of alcohol use along with alcohol-related problems.

First, the capacity of the DrAFT-CS and the in-person PFI condition to reduce participants' quantity, frequency, and alcohol-related problems was examined. Specifically, it was predicted that both active treatment conditions would significantly reduce participants' misuse of alcohol as measured by the eight dependent variables. The analyses indicated that this hypothesis was partially supported with significant reductions evidenced in both treatment conditions for weekly alcohol consumption, average blood alcohol concentration, peak blood alcohol concentration, peak quantity of alcohol consumed on a single occasion, typical quantity of alcohol consumed on a weekend evening (only for the DrAFT-CS condition) and in alcohol-related consequences but not in frequency of drinking or number of occasions spent drinking to get drunk. With both the DrAFT-CS and the in-person PFI conditions focusing on harm-reduction, that is on reducing the quantity and frequency of drinking to more socially appropriate levels, and not necessarily abstinence, the reductions seen in alcohol consumption, blood alcohol concentrations, and alcohol-related problems but not in frequency for both of the active treatment conditions is not a cause for concern. The goal is to reduce problem drinking not drinking all

together. Both of the active treatment conditions reduced typical BAC levels down from a level where severe motor impairments occur down to a level where they are close to being under the legal limit of 0.08 percent. This reduction was equivalent to a 180 lb male (the average weight of men in this study) decreasing his number of drinks over a 2-hour period by 3.5 for the in-person PFI condition and 2.5 for the DrAFT-CS condition, or a 138 lb female (the average weight of women in this study) decreasing her number of drinks over a 2-hour period by 2.25 for the in-person PFI condition and 1.75 for the DrAFT-CS condition. Peak BAC levels were reduced even more though not near the legal limit. For the two active treatments, BACs were reduced from a level where blackouts can occur down to a percentage where some people will begin to evidence motor impairment. Viewed another way, the reductions were equivalent to a 180 lb male decreasing his number of drinks over a 2-hour period by 5 for the in-person PFI condition and 3 for the DrAFT-CS condition, or a 138 lb female decreasing her number of drinks by 3 for the in-person PFI condition and 2 for the DrAFT-CS condition over a 2-hour period. Though this is not abstinence, a decrease of this nature from only a 45-minute intervention (the DrAFT-CS) or what is an approximately a 90-minute intervention (the in-person PFI condition) is promising. Furthermore, this study replicated the DrAFT-CS ability to reduce heavy-drinking college students' misuse of alcohol.

Second, the DrAFT-CS was compared to the in-person PFI condition, the repeated assessment condition, and the assessment-only control condition in its capacity to reduce participants' drinking behaviors. Specifically, it was predicted that the DrAFT-CS would be superior to both the repeated assessment and assessment-only control conditions and comparable to the in-person PFI condition its ability to reduce alcohol consumption and related problems.

Analyses indicated that when the DrAFT-CS condition was compared to the assessment-only condition with regard to reductions in total number of drinks consumed during the previous week, highest alcohol consumption on a single occasion during the previous month, typical BAC, and peak BAC, the data trended towards significance with *p*'s $\leq .15$. However, no trend was observed when comparing the DrAFT-CS to the repeated assessment or in-person PFI conditions. Analyses further indicated that the in-person PFI condition was superior to the AO condition with regard to reductions in total number of drinks consumed during the previous week, highest alcohol consumption on a single occasion during the previous month, typical BAC, and peak BAC but at the $\alpha < .01$ level, and was superior to the RA condition with regard to average and peak BAC at the $\alpha \leq .01$ level and with regard to total number of drinks consumed during the previous week and highest alcohol consumption on a single occasion during the previous month at the $\alpha < .10$.

These results indicate that not only is the DrAFT-CS and in-person PFI conditions superior to no treatment at all, but that repeated drinking assessment also serves to reduce some aspects of alcohol consumption, though not necessarily to the same level as the two active treatments. This reduction of alcohol consumption over repeated measures has been seen in other studies as well (e.g., Murphy et al., 2001). In addition, though not statistically significant across all alcohol consumption domains (the exception was peak BAC), the in-person PFI condition also seemed to be slightly superior to the DrAFT-CS condition in its capacity to reduce alcohol consumption. This may indicate that having participants engage in a one-on-one motivational interview serves to allow them to better process and accept the feedback that they receive. However, previous studies (Murphy et al., 2004; Walters & Neighbors, 2005; White et

al., 2006) have shown that the addition of a motivational interview does not necessarily lead to a larger reduction in alcohol consumption.

It may be the case then that because participants in the in-person PFI condition were allowed to take their personalized feedback report home with them, they were able to look over the feedback more and that is what led them to better process the information. This confound is a limitation of the present study and will be discussed below; however, it should also be acknowledged that if used in a real world situation, the DrAFT-CS would have been able to be used repeatedly by the participants (since it would be on a compact disc that the student could easily take with them). As such, it may be possible that if participants were encouraged to complete the DrAFT-CS multiple times over the semester that they may have reduced the drinking significantly more than what was seen in the present study.

Third, the organization, thoroughness, helpfulness, and non-confrontational nature of the DrAFT-CS was evaluated and compared to the in-person PFI condition. It was predicted that both condition interventions would be viewed positively in the aforementioned areas. The results indicated that overall participants found both conditions to be helpful, organized, thorough and non-confrontational. However, the DrAFT-CS was found to be significantly lower in agreement than the in-person PFI condition on one item asking if "the intervention did not impose a particular choice about alcohol upon me." That is, participants in the DrAFT-CS condition compared to those in the in-person PFI condition found the intervention to impose a particular choice about alcohol upon them. The meaningfulness of this difference is negligible, however, since the mean answer to this question for both groups was comparable to "Agree." It should also be noted that analyzing whether the PSQ somehow moderated the treatment effect was not possible due to six of the PSQ reports in the DrAFT-CS condition not being identified with a

participant identification number; therefore, for six participants', data could not be connected to their PSQ score.

Strengths and Limitations

The present study sought to replicate and extend previous research examining the effectiveness of computer-based PFIs. The results of this study support previous research demonstrating that the DrAFT-CS was more effective at reducing alcohol consumption than an assessment-only control condition. This study, however, also adds to the previous research by adding two more intensive comparison conditions: a repeated assessment condition and an in-person PFI condition. As a result, the present study provides the ability to make stronger conclusions as to the effectiveness of the DrAFT-CS.

Furthermore, this study is the first to examine the effectiveness of an all-inclusive computer-based PFI. In light of the significant alcohol consumption reductions, the cost-effectiveness of the DrAFT-CS, and the ease with which the DrAFT-CS can be disseminated to college students, this is truly a promising advance in the computer-based PFI literature and in college drinking intervention research in general. It would be very easy and economical to include a compact disc of the DrAFT-CS program in every college freshman's orientation packet. It could also be made available at campus health care clinics. With personal access to the DrAFT-CS, students would be able to reassess their drinking throughout the year as often as they like.

Several important limitations are also acknowledged in the current study. First, due to the small sample sizes and the four-group design the study had insufficient statistical power to detect small to moderate effect sizes. The number of participants that would have been needed to provide sufficient statistical power was beyond our recruiting and logistical capabilities (i.e.,

funding). Future studies evaluating the DrAFT-CS should utilize a sample size that is approximately twice the size of the sample used in the current study.

A second limitation exists with regard to a confound in the in-person PFI condition. Participants in this condition were allowed to take their personal feedback report with them, something the DrAFT-CS condition did not allow. As such, it is not clear from the present study if the non-statistical difference between the two conditions is due to one group having a live interviewer versus a computer interviewer, or if the difference is due to the feedback report. Future research should attempt to eliminate this confound by either not allowing the feedback report to be taken home with the participant in the in-person PFI group or by allowing the DrAFT-CS group to take home their own personal feedback report.

Another limitation of the present study is the absence of collateral verification of self-reported drinking consumption and related problems. It would add further weight to the present study if collateral verification of drinking was obtained from someone close to the participant. However, in alcohol use studies where researchers have collected collateral reports (e.g., Marlatt et al., 1998), the participants' self-report was found to be respectably correlated with collateral report of the participants drinking and participants did not appear to be underreporting or misrepresenting their drinking behaviors (Marlatt et al., 1998).

Finally, the relatively short 10-week follow-up period is another limitation of the present study. As such, the current study is limited with regard to the conclusions that can be made about the long-term effects of the DrAFT-CS. However, previous research with both the DrAFT-CS (Leffingwell et al., 2007) and in-person PFI conditions (Larimer et al., 2001) has shown maintained reductions in alcohol consumption at 6-month and 1-year follow-up, respectively.

Conclusions

In summary, the present study sought to replicate and extend previous computer-based PFI research. The results of the study indicated that the DrAFT-CS serves as a very cost-effective and easily disseminated harm-reduction intervention. Future examinations of the DrAFT-CS should not only increase sample size but also investigate how allowing participants to keep the DrAFT-CS program on a compact disc and encouraging them to use the program throughout the semester affects their drinking behavior. Furthermore, it would be beneficial to investigate the long-term effects of the DrAFT-CS.

Chapter VII

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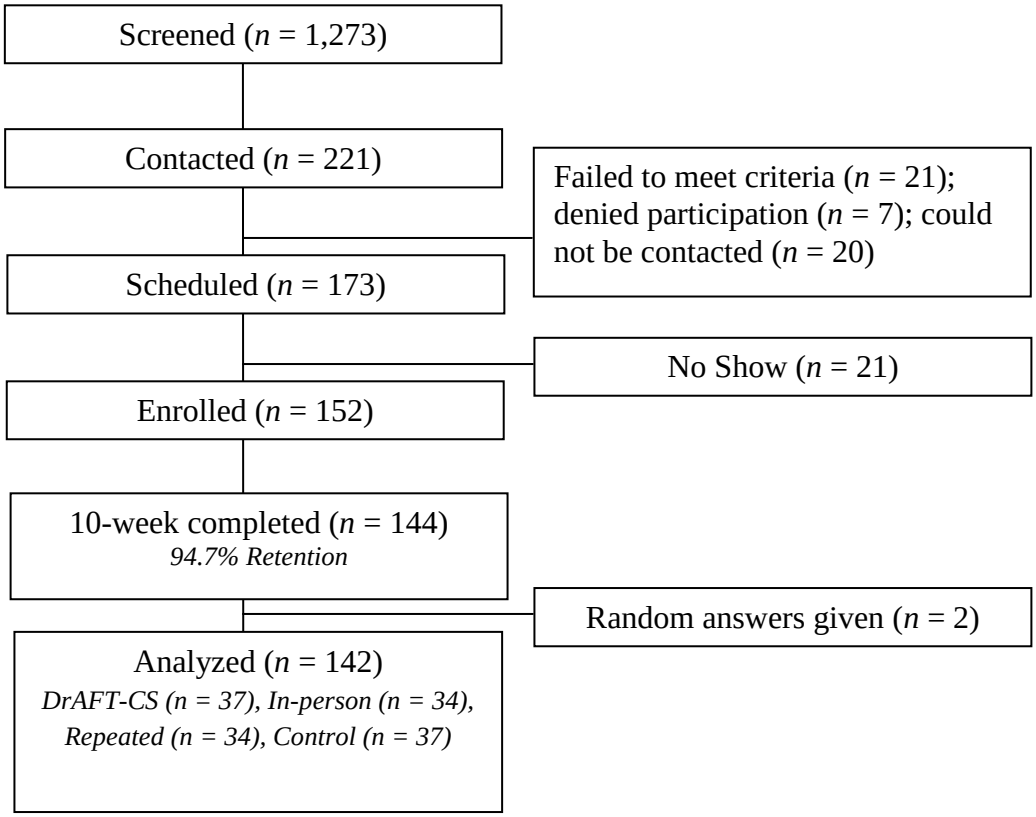
Appendix A

Table A1.

Participant Flow in Randomized Controlled Trial.



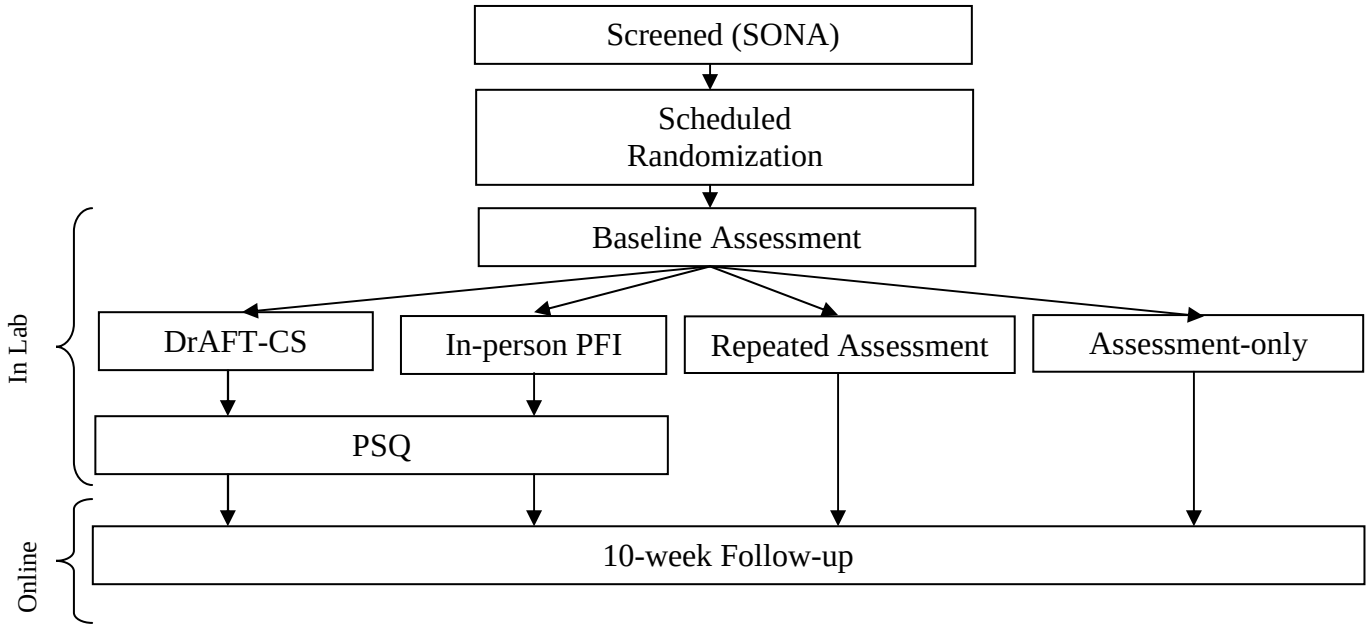


Table A2.

Demographic Characteristics of Participants (N = 152)

Characteristic	*n*	%
Sex		
Male	83	54.6
Female	69	45.4
Age at baseline (years)		
18-19	61	40.1
20-21	59	38.8
22-23	25	16.5
24-25	7	4.6
Year of college		
First year	52	34.2
Second year	24	15.8
Third year	41	27.0
Fourth year	35	23.0
Ethnicity		
White/Caucasian	128	84.2
Black/African American	3	2.0
Native American	7	4.6
Hispanic/Latino	4	2.6
Asian	2	1.3
Bi-racial	5	3.3
Other	1	0.7
No ethnicity provided	2	1.3
Greek status		
Independent	103	67.8
Fraternity	24	15.8
Sorority	23	15.1
No status provided	2	1.3
Living situation		
Alone	13	8.6
With spouse	1	0.7
With partner	3	2.0
With parents	5	3.3
Greek housing	28	18.4
Dorms	26	17.1
With roommates	75	49.3
With children only	1	0.7

Table A3.

Baseline and 10-week Follow-up Means and Standard Deviations for all Conditions.

	WkQuant		Avg BAC		Peak BAC	
	Pre-	Post-	Pre-	Post-	Pre-	Post-
Condition	*M (SD)*	*M (SD)*	*M (SD)*	*M (SD)*	*M (SD)*	*M (SD)*
In-person	**23.3 (13.0)**	**18.3 (15.0)**	**.139 (.076)**	**.090 (.067)**	**.193 (.131)**	**.112 (.075)**
DrAFT	*24.0 (15.7)*	*21.6 (17.8)*	**.119 (.049)**	**.090 (.056)**	**.170 (.077)**	**.131 (.083)**
Repeated	18.2 (12.1)	17.0 (11.8)	.097 (.062)	.088 (.060)	.135 (.072)	.121 (.074)
Control	23.2 (14.2)	23.7 (16.6)	.114 (.076)	.108 (.062)	.150 (.082)	.143 (.074)

	Peak		Typ Quant		Frequency		Drunk	
	Pre-	Post-	Pre-	Post-	Pre-	Post-	Pre-	Post-
Condition	*M (SD)*	*M (SD)*	*M (SD)*	*M (SD)*	*M (SD)*	*M (SD)*	*M (SD)*	*M (SD)*
In-person	**12.0 (4.9)**	**8.6 (5.1)**	9.2 (5.4)	8.3 (6.7)	8.1 (4.8)	7.2 (6.0)	4.6 (3.9)	4.3 (4.4)
DrAFT	**11.7 (4.6)**	**9.8 (5.2)**	*9.7 (5.6)*	*8.2 (5.4)*	9.6 (5.3)	8.5 (5.8)	6.5 (5.7)	5.7 (4.8)
Repeated	**11.0 (4.5)**	**9.5 (4.7)**	8.3 (4.9)	7.1 (4.9)	8.2 (5.1)	7.4 (4.8)	4.0 (3.8)	4.4 (4.3)
Control	12.6 (4.4)	12.1 (4.8)	8.9 (4.5)	10.0 (5.6)	9.0 (5.8)	8.3 (4.6)	5.8 (5.6)	5.2 (4.7)

	B-YAACQ	
	Pre-	Post-
Condition	*M (SD)*	*M (SD)*
In-person	**9.6 (4.1)**	**6.9 (5.0)**
DrAFT	**11.0 (5.6)**	**8.4 (6.3)**
Repeated	**10.4 (5.4)**	**7.2 (6.3)**
Control	11.5 (4.7)	10.3 (6.0)

Note. WkQuant = weekly alcohol consumption; Avg BAC = average blood alcohol concentration for identified drinking occasions during week before assessment; Peak BAC = peak blood alcohol concentration for single occasion during week before assessment; Peak = highest quantity of alcohol consumption in the past month; TypQuant = typical quantity of drinks for a weekend evening; Frequency = frequency of drinking over the past month; Drunk = number of occasions spent drinking to get drunk; B-YAACQ = alcohol-related problems.

Bold font refers to statistically significant reductions from pre- to post-treatment ($p \leq .05$); Font in italics indicates significant reductions ($p < .10$).

Table A4.

Mean Differences from Baseline to 10-week Follow-up and Analysis of Variance (ANOVA) Results for Eight Alcohol Use Variables

	In-person PFI		DrAFT-CS		Repeated Assessment		Assessment-only Control		ANOVA				
Measure	M_{diff}	SD_{diff}	M_{diff}	SD_{diff}	M_{diff}	SD_{diff}	M_{diff}	SD_{diff}	F	df	p	η^2	$1 - \beta$
DDQ													
WkQuant	-5.03[a1]	1.66	-2.39[*a*]	1.20	-1.24[2]	1.00	0.54[b*b*]	1.65	2.72*	3,136	.047	0.057	0.649
Avg BAC	-0.049[a]	0.069	-0.029[*a*]	0.046	-0.009	0.077	-0.005[b*b*]	0.061	3.37*	3,136	.020	0.069	0.753
Peak BAC	-0.081[a]	0.121	-0.039[*a*]	0.072	-0.014	0.081	-0.007[b*b*]	0.070	4.90**	3,135	.003	0.098	0.902
FQQ													
Peak	-3.38[a1]	5.10	-1.93[*a*]	4.82	-1.53[2]	3.08	0.49[b*b*]	4.04	2.70*	3,138	.048	0.055	0.645
TypQuant	-0.96	7.05	-1.54[I]	5.28	-1.15[1]	3.80	1.14[II 2]	5.71	1.70	3,138	.170	0.036	0.436
Frequency	-0.93	3.24	-1.04	5.86	-0.79	4.80	-0.64	6.45	0.04	3,138	.990	0.001	0.057
Drunk	-0.32	3.14	-0.85	5.08	0.37	2.22	-.062	5.25	0.56	3,137	.644	0.012	0.163
B-YAACQ	-2.7	4.5	-2.6	4.0	-3.2	6.2	-1.2	5.6	1.02	3,134	.388	0.022	0.270

Note. WkQuant = weekly alcohol consumption; Avg BAC = average blood alcohol concentration for identified drinking occasions during week before assessment; Peak BAC = peak blood alcohol concentration for single occasion during week before assessment; Peak = highest quantity of alcohol consumption in the past month; TypQuant = typical quantity of drinks for a weekend evening; Frequency = frequency of drinking over the past month; Drunk = number of occasions spent drinking to get drunk; B-YAACQ = alcohol-related problems.

***p* < .01; **p* < .05; Different normal font effects superscripts refer to statistically significant group differences ($p < .01$); Different Roman numeral superscripts refer to statistically significant group differences ($p < .05$); Different numerical superscripts refer to statistically significant group differences ($p < .10$); Different superscripts in italics refer to statistically significant group differences ($p \leq .15$).

Table A5.

Comparison of Mean PSQ Item Scores for Active Treatment Conditions

PSQ Items	In-person PFI		DrAFT-CS		
	M	*SD*	*M*	*SD*	*t*
1) I would recommend this program to a friend.	1.32	0.53	1.19	0.57	1.057
2) The interview was thorough and complete.	1.62	0.49	1.46	0.56	1.327
3) The program seemed well organized.	1.57	0.50	1.57	0.77	0.001
4) The program was not confrontational.	1.11	0.88	1.27	1.10	0.703
5) The program made me think about my use of alcohol.	1.38	0.68	1.30	0.70	0.504
6) The program did not impose a particular choice about alcohol upon me.	1.32	0.71	1.81	1.13	2.347*
7) I learned new things from the program.	1.27	0.65	1.19	0.81	0.474
Average Score	1.37	2.59	1.25	3.29	1.178

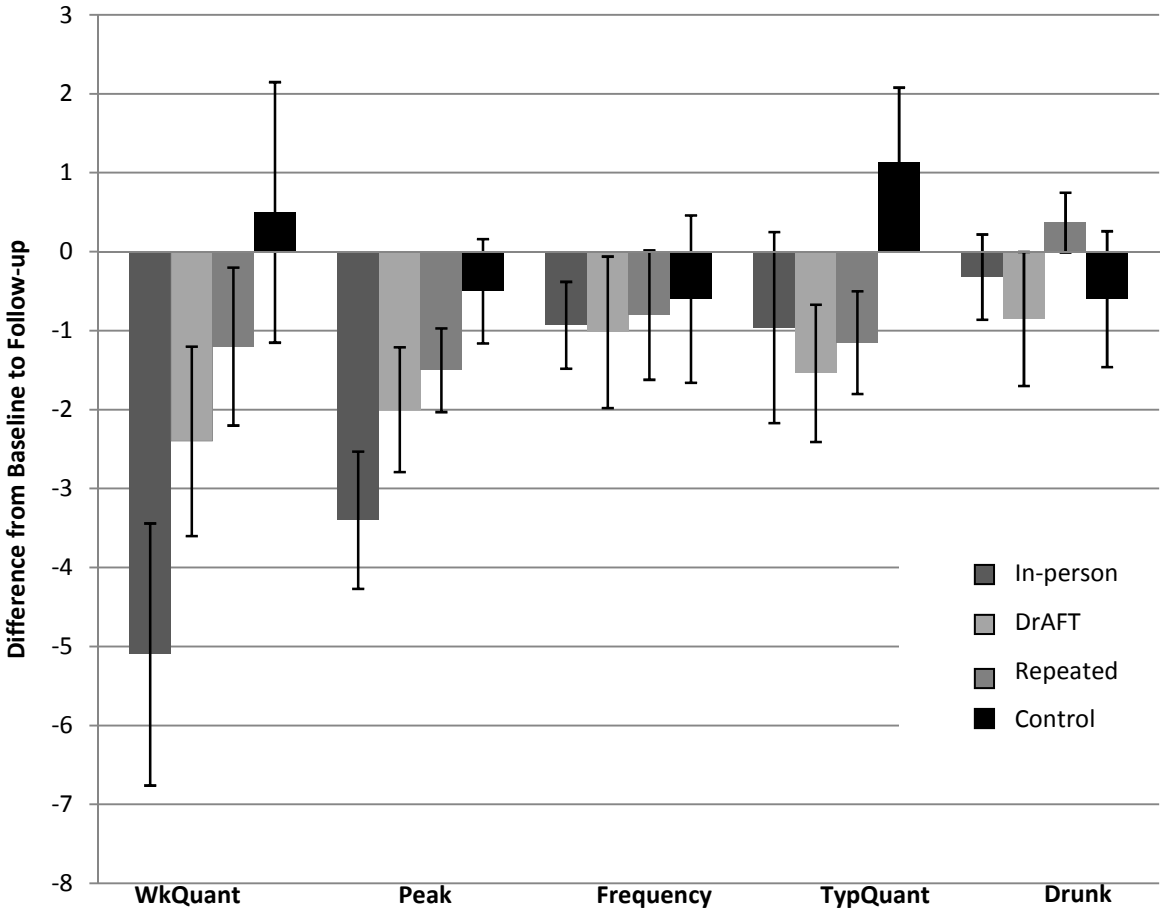
*$p < .05$

Appendix B

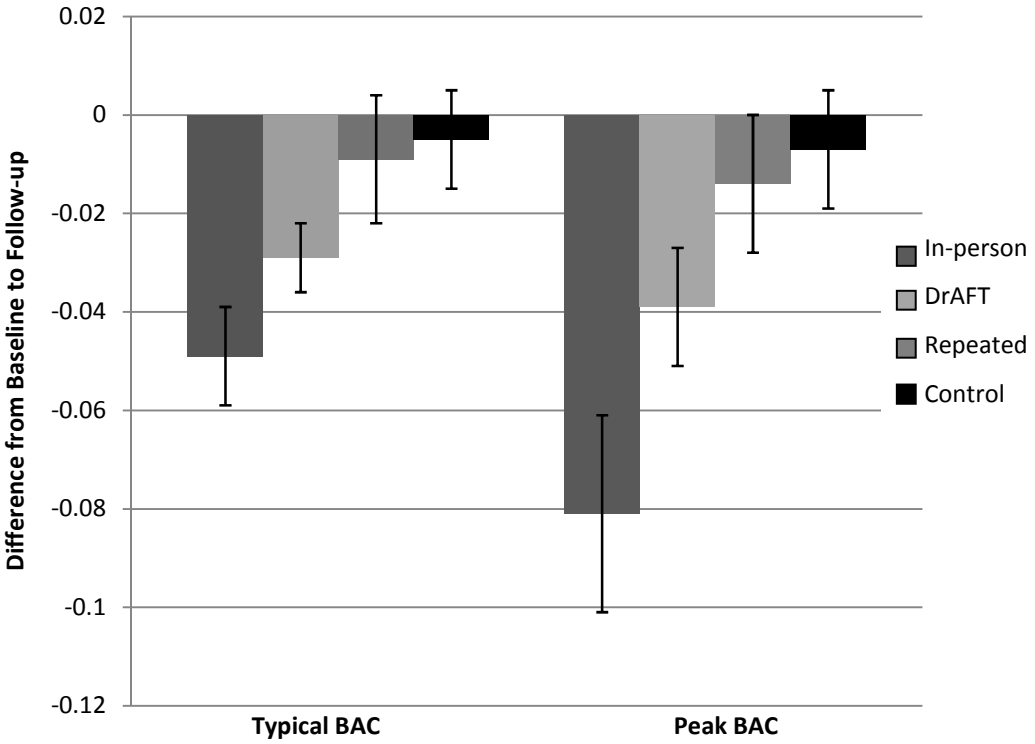
Figure 1. Mean changes in weekly quantity of alcohol consumed and FQQ items from baseline to 10-week follow-up assessment for all conditions.

Figure 2. Mean changes in average and peak blood alcohol concentrations from baseline to 10-week follow-up assessment for all conditions.

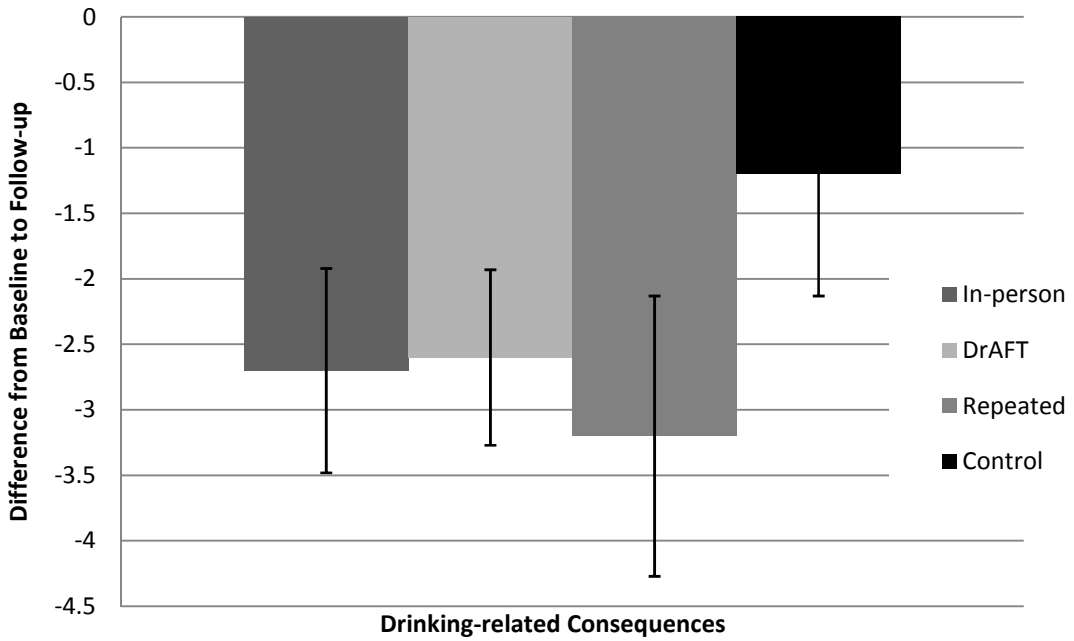
Figure 3. Mean changes in drinking-related consequences from baseline to 10-week follow-up for all conditions.



Note. WkQuant = change in weekly alcohol consumption; Peak = change in highest quantity of alcohol consumption in the past month; Frequency = change in frequency of drinking over the past month; TypQuant = change in typical quantity of drinks for a weekend evening; Drunk = change in number of occasions spent drinking to get drunk. Error bars represent the standard error of the mean.



Note. Avg BAC = changes in average blood alcohol concentration for identified drinking occasions during week before assessment; Peak BAC = changes in blood alcohol concentration for highest alcohol quantity drinking occasion during week before assessment. Error bars represent the standard error of the mean.



Note. Drinking-related Consequences = changes in B-YAACQ score. Error bars represent the standard error of the mean.

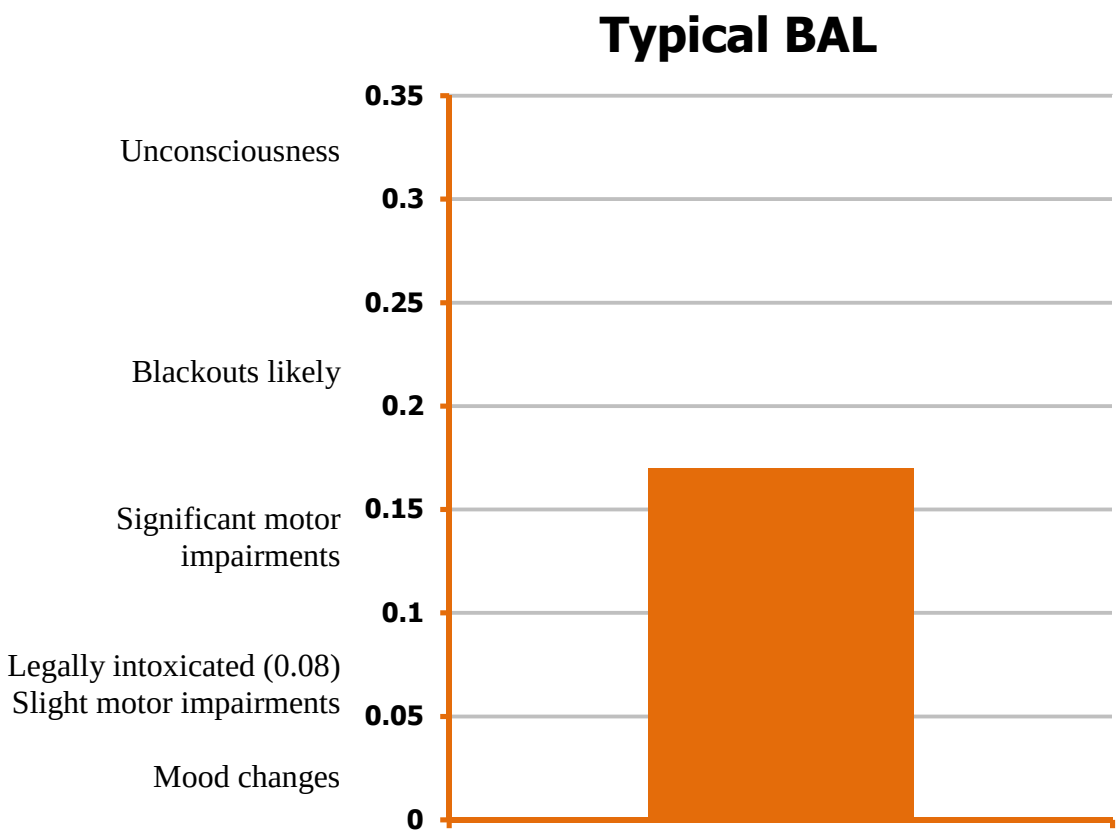
Appendix C

Personal Feedback Report
prepared for

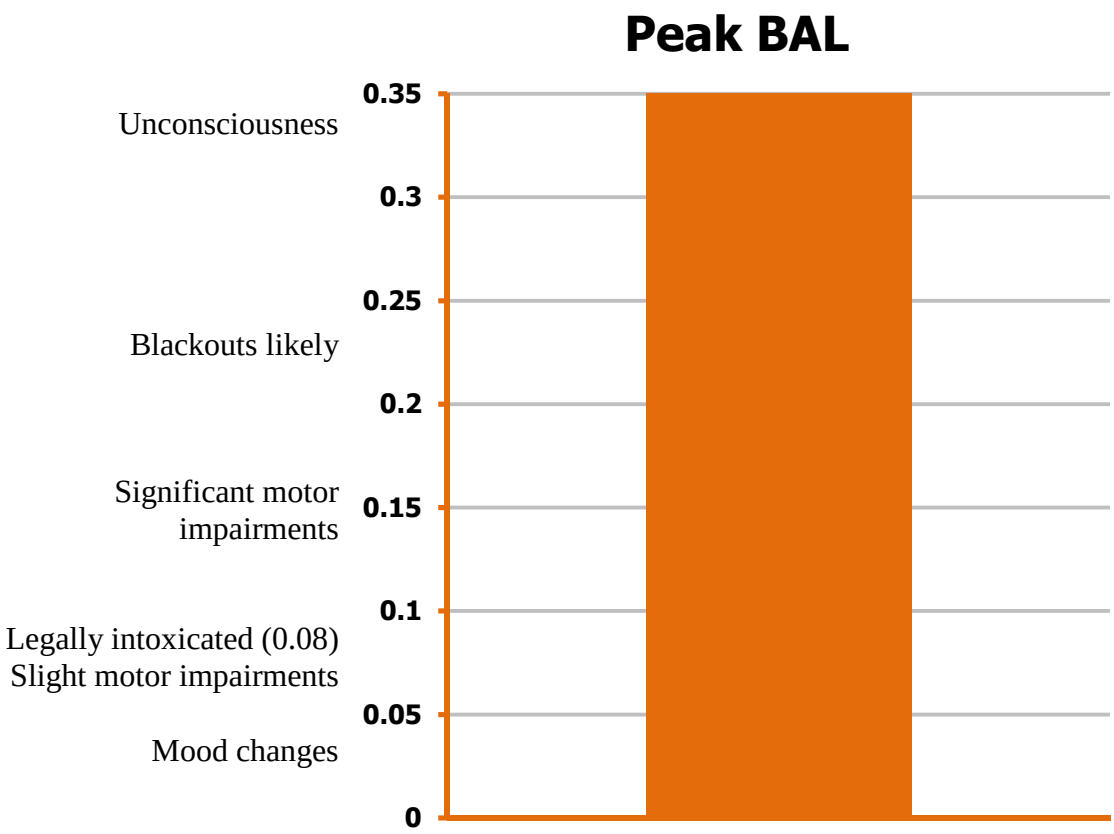
Daisy Drinker

Behavior Change Lab
Department of Psychology
Oklahoma State University

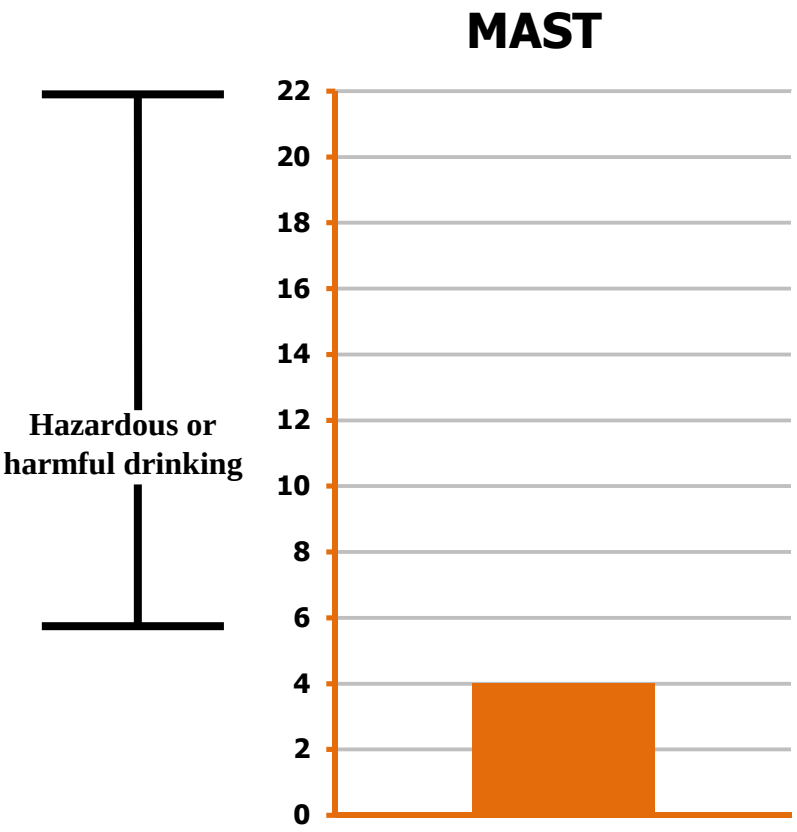
For a typical drinking occasion you reported drinking **8** drinks over a period of **4.5** hours.
Your BAL for a typical drinking occasion is **.17**.

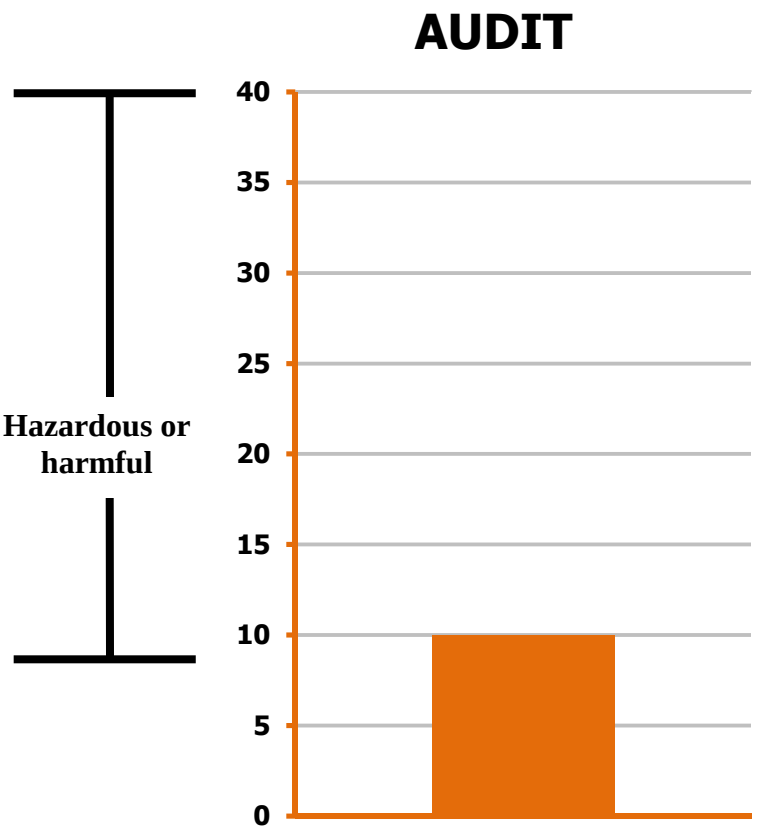


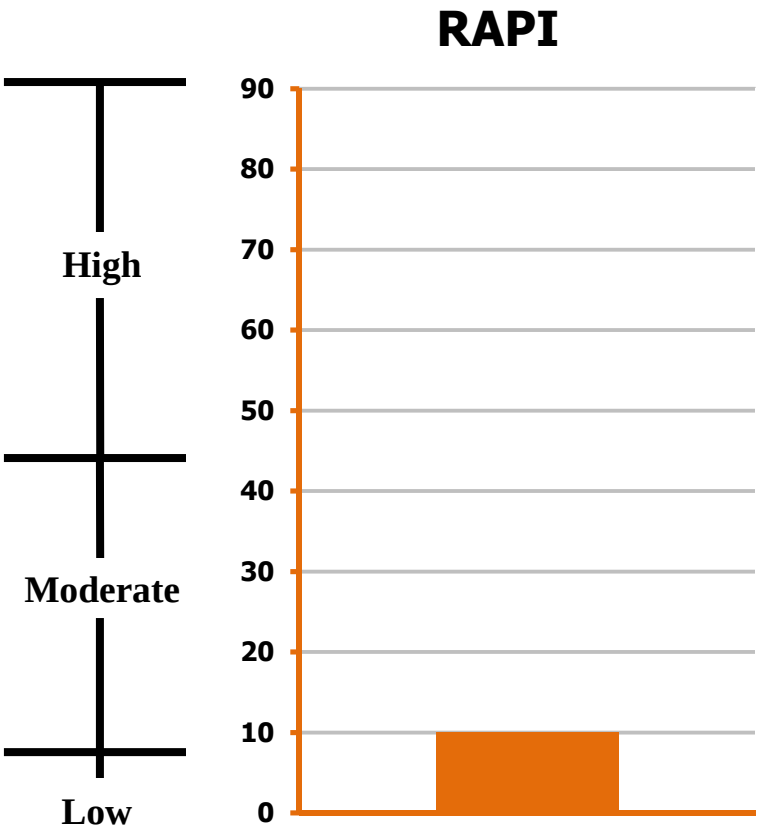
For your peak drinking experience in the past 6 months, you reported drinking **14** drinks over a period of **6** hours.
Your BAL for a peak drinking occasion is **.35.**



	What you said	What it is
Percentage of students who consumed alcohol in the past year	**70%**	80%
Percentage of students who consumed alcohol in the past 30 days	**50%**	62%
Percentage of students who drove a car while under the influence of alcohol during the past year?	**30%**	29%
Percentage of students who missed class due to alcohol use?	**40%**	29%
Percentage of students who do not drink alcohol at all?	**30%**	20%
Percentage of students who drink 5-8 drinks on one occasion?	**40%**	17%
Percentage of students who drink more than 8 drinks on one occasion?	**20%**	1%


MAST
Hazardous or harmful drinking
22
20
18
16
14
12
10
8
6
4
2
0


AUDIT
Hazardous or harmful
40
35
30
25
20
15
10
5
0


RAPI
High
Moderate
Low
90
80
70
60
50
40
30
20
10
0

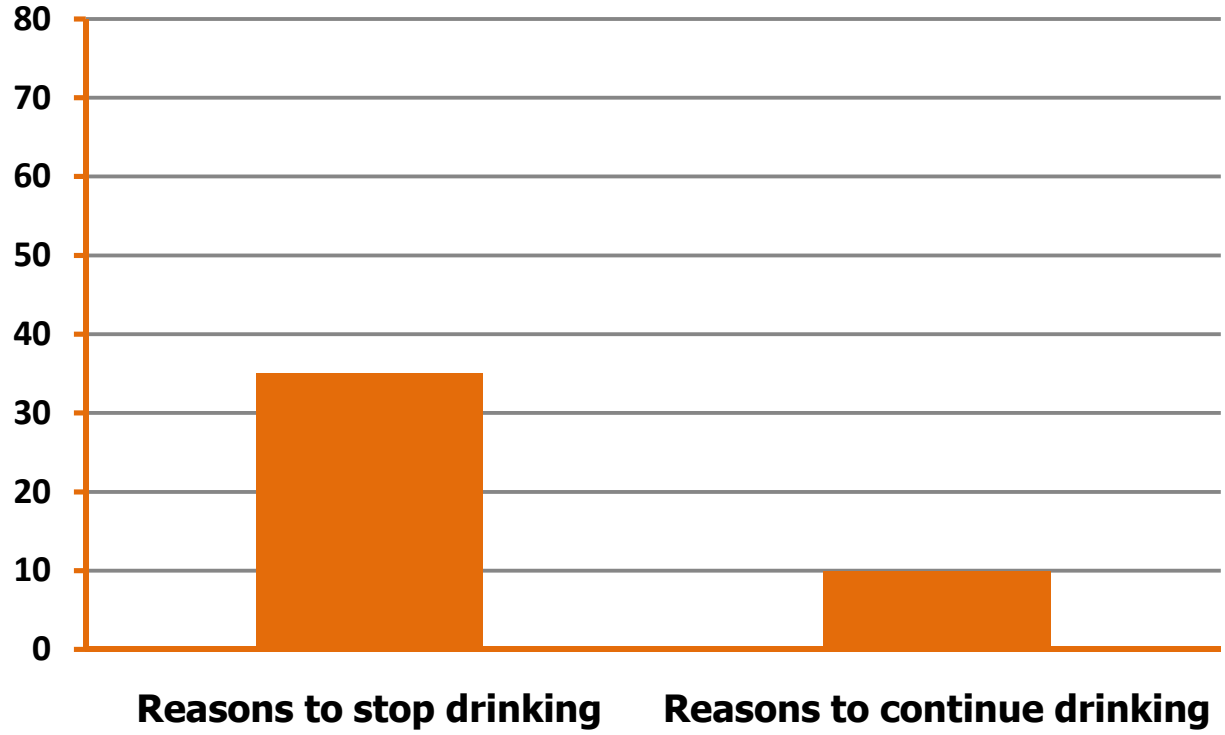
DSM Criteria – Abuse (1 or more)

Drinking has resulted in failure to fulfill duties at work, home, or school.
Drinking in situations when it is physically dangerous.
Legal problems related to drinking.
Continued drinking despite it causing repeated problems.

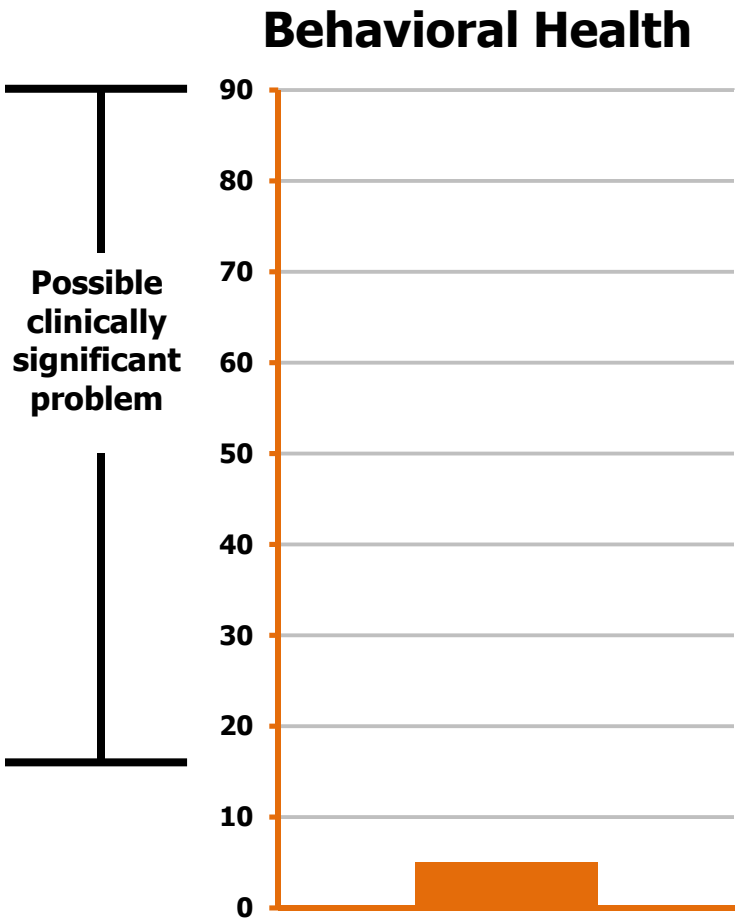
DSM Criteria – Dependence (3 or more)

Tolerance (needing more alcohol to gain the same effect)
Withdrawal (taking alcohol to get rid of unpleasant symptoms)
Drinking larger amounts or over a longer period of time than you planned
Having a persistent desire or history of unsuccessful attempts to quit drinking
Spending a lot of time drinking or recovering from the effects of drinking
Giving up things at work, home, or with friends to drink
Continuing to drink despite having problems caused by drinking

Decisional balance Q (pro/cons chart)



BHI (Chart)


Behavioral Health
Possible clinically significant problem
90
80
70
60
50
40
30
20
10
0

You reported a negative/positive family history of alcoholism.

1728 calories from alcohol in an average week

To burn off these calories it would take:
384 minutes walking
Or
301 minutes on a Stairmaster

$192 a semester if you drank cheaper, domestic beer
$624 a semester if you drank mixed drinks or are buying alcohol at a bar
Your true cost is most likely somewhere between these two

Situations where you might drink excessively:	
At a party	When having unpleasant emotions
At a concert	When in physical discomfort
When celebrating	When having pleasant emotions
After a fight with someone close to you	When in conflict with others
When feeling down	When under social pressure to use
When angry or upset	During pleasant times with others
When with a lover	When testing control over your use of alcohol
When on a date	When fighting urges and temptations to drink
Before having sex	

What is your current goal for your drinking behavior?

No change	
Reduce quantity	
Reduce frequency	
Reduce quantity and frequency	
Completely abstain	

At this moment how committed are you to making a change in your drinking habits?

0%(not at all committed) – 50%(somewhat committed) – 100%(totally committed)

Appendix D

Informed Consent for Research Participation
Alcohol Use in College

What is the project? Who is responsible for the project?
This project is designed to investigate collegiate alcohol use. The project is titled "Alcohol Use In College" and is being conducted by Thad R. Leffingwell, Ph.D., Associate Professor in the Department of Psychology at Oklahoma State University. This project is approved by OSU's Institutional Review Board.

Why might I be asked to participate?
You have been invited to participate because you indicated at least one occasion of high-risk drinking in the last month on a screening questionnaire and you are currently a college student between the ages of 18 and 23.

What will I be asked to do?
Those who meet eligibility criteria will be invited to participate in the study. If you choose to participate, you will complete a brief packet that assesses your alcohol use and associated behaviors and consequences. This assessment will take 30-90 minutes to complete. You will then be asked to complete two brief (< 20 minutes) follow-up assessments that assess your alcohol use ad associated behaviors and consequences over the next two months by completing a questionnaire on the internet. Your decision to participate is strictly voluntary, and you may choose to stop participating at any time.

What are the risks of participating in this project?
Some people may experience some discomfort when responding to sensitive questions about their use of alcohol or related consequences. Participation in this study may also cause some people to reflect on important life choices and experiences, and information about professional services available in the community will be made available to you. Participation in this study requires that you divulge information about behavior that may be illegal (e.g., drinking alcohol under age). Thus, there is some small risk that this data may be subpoenaed by a judge.

What about my privacy and confidentiality?
Participation in this study will require you to share some information that you may consider quite private and sensitive. All records from this study will be kept confidential to the extent allowable by law, and several measures will be taken to make it very unlikely that this confidentiality is compromised. Computerized data will be maintained on a password-protected computer in a password-protected file accessible only by the researchers. Identifying information will be replaced with a code number, and information that connects code numbers with names will be kept in a separate file by the researchers. Data for this study will be kept for three years and then will be destroyed. Results of this study will be reported collectively. In other words, no individual data will be reported. It is possible that the consent process and data collection will be observed by research oversight staff responsible for safeguarding the rights and wellbeing of people who participate in research.

What are the benefits of participating?
If you choose to participate, the primary benefit is that you will receive two units of research credit for your participation in the first session. Additionally you will receive $5 for your participation in the online one-month follow-up, and $10 for the two-month follow-up. Also, you will earn an entry into a lottery drawing for a personal portable DVD player with each follow-up assessment. If you complete each follow-up assessment, you will have three chances to win this prize (approximate odds of winning are 1:90). Additionally, regardless of what condition to which you are randomly assigned, you will receive a brochure with information about alcohol use and referral information should you wish to seek professional assistance for your drinking behavior. In addition, participants in the two of the three conditions will receive feedback about their use of alcohol and associated consequences that may help them make decisions to reduce their risk.

What are the alternatives?
The alternative is to not participate. Your participation is voluntary. There is no penalty for choosing to not participate. If you are eligible for research credit in a course due to your participation, the instructor of that course will make optional comparable activities available. You may choose to not participate now, or at any time during your participation. <u>Participation in this study should not be viewed as a substitute for treatment of alcohol problems or for a professional evaluation of your health.</u>

What if I have other questions or concerns about my participation?
If you have any questions or need to report an effect about the research procedures, you may contact Thad R. Leffingwell, Ph.D. at (405) 744-7494 or 116 North Murray, Stillwater, Oklahoma 74078. If you have questions about your rights as a research participant, you may take them to Shelia Kennison, Ph.D., IRB Chair of OSU's Institutional Review board at (405) 744-1676 or 219 Cordell North, Stillwater, OK 78078.

STATEMENT OF VOLUNTARY PARTICIPATION
I understand that participation is voluntary and that I will not be penalized if I choose not to participate. I also understand that I am free to withdraw my consent at any time and end my participation in this project without penalty.

SIGNATURES
"I have read and fully understand the consent form. I have had a chance to ask questions about the study and my questions have been answered to my satisfaction. I sign this form freely and voluntarily. I copy of this form has been given to me."

Date: _____/ _____/_____ Time: _____:_____am/pm

Name (please print) Signature

"I certify that I have personally explained all elements of this form to the participant before requesting the participant to sign it."

Signed: _____
Project director or authorized representative

Oklahoma State University Institutional Review Board

Date	Thursday, January 10, 2008	Protocol Expires:	1/9/2009
IRB Application No:	AS0512		
Proposal Title:	High-risk Alcohol Use Prevention (Year Two)		

Reviewed and Processed as: Full Board
Continuation

Status Recommended by Reviewer(s): **Approved**

Principal Investigator(s):

Thad Leffingwell
215 N. Murray
Stillwater, OK 74078

Approvals are valid for one calendar year, after which time a request for continuation must be submitted. Any modifications to the research project approved by the IRB must be submitted for approval with the advisor's signature. The IRB office MUST be notified in writing when a project is complete. Approved projects are subject to monitoring by the IRB. Expedited and exempt projects may be reviewed by the full Institutional Review Board.

☑ The final versions of any printed recruitment, consent and assent documents bearing the IRB approval stamp are attached to this letter. These are the versions that must be used during the study.

Widmark's Formula (Dimeff et al.,1999)

$$BAL = [(\#\ drinks/2) \times (gc/weight)] - (\#\ hours \times mr)$$

# drinks = number of standard drinks (0.5 oz. alcohol each)
gc = gender constant; 7.5 for males and 9.0 for females
# hours = number of hours between first and last drink
mr = metabolic rate for alcohol = 0.016

Demographics

To protect your identification please enter your personal identification code number below. Remember, your code number consists of the last 4 digits of your social security number, your birth month, and birth day**.**

(For example, if your social security number is 123-45-6789 and your birth date is Feb. 7, your unique code number would be 6789-02-07.)

Last 4 digits of your social security number: ### - ## -

Birth month: -- choose one --

Birth day: -- choose one --

Gender: male female

Current Age

Year in College Choose One

Ethnicity Choose One

Your current living situation Choose One

Your current marital status Choose One

Are you a Greek member? Choose One

Daily Drinking Questionnaire (DDQ; Collins, et al., 1985)

For the following questions, *one drink* equals:

- 4 ounces of wine
- 1 wine cooler
- 12 ounces of 3.2 beer
- 8-10 ounces of "6-point" beer, malt liquor, ice beers, or "microbrew" beers
- A mixed drink with 1 ounce of liquor
- A single shot of liquor

For the *past month*, please select a number for each day of the week indicating the *typical number of drinks* you usually consume on that day, and the *typical number of hours* you usually drink on that day. Highlight the box, then enter your answer. Please be sure to fill out the information regarding weight.

***** If you did not consume any drinks on a certain day please enter "0" in the "# of Drinks" box and "0" in the "# of Hours" box.*****

Sunday	# of Drinks	# of Hours
Monday	# of Drinks	# of Hours
Tuesday	# of Drinks	# of Hours
Wednesday	# of Drinks	# of Hours
Thursday	# of Drinks	# of Hours
Friday	# of Drinks	# of Hours
Saturday	# of Drinks	# of Hours

Frequency-Quantity Questionnaire (FQQ)

For the following questions, *one drink* equals:

- 4 ounces of wine
- 1 wine cooler
- 12 ounces of "3-2" beer
- 8-10 ounces of "6-point" beer, malt liquor, ice beers, or "microbrew" beers
- A mixed drink with 1 ounce of liquor
- A single shot of liquor

Think of the occasion you drank the most this past month. How much did you drink?		
On *an average weekend evening*, how much alcohol do you typically drink? Estimate for the past month.		
How often during the last month did you drink alcohol?		
On how many occasions did you drink to get drunk in the past 30 days?		

Brief-Young Adult Alcohol Consequences Questionnaire (B-YAACQ), page 1 of 2

Answer the following questions based on your experiences over the past year.	
While drinking, I have said or done embarrassing things.	-- choose one --
I have had a hangover (headache, sick stomach) the morning after I had been drinking.	-- choose one --
I have felt very sick to my stomach or thrown up after drinking.	-- choose one --
I often have ended up drinking on nights when I had planned not to drink.	-- choose one --
I have taken foolish risks when I have been drinking.	-- choose one --
I have passed out from drinking.	-- choose one --
I have found that I needed larger amounts of alcohol to feel any effect, or that I could no longer get high or drunk on the amount that used to get me high or drunk.	-- choose one --
When drinking, I have done impulsive things that I have regretted later.	-- choose one --
I've not been able to remember large stretches of time while drinking heavily.	-- choose one --
I have driven a car when I knew I had too much to drink to drive safely.	-- choose one --
I have not gone to work or missed classes at school because of drinking, a hangover, or illness caused by drinking.	-- choose one --
My drinking has gotten me into sexual situations I later regretted.	-- choose one --
I have often found it difficult to limit how much I drink.	-- choose one --

I have become very rude, obnoxious, or insulting after drinking.	-- choose one --
I have woken up in an unexpected place after heavy drinking.	-- choose one --
I have felt badly about myself because of my drinking.	-- choose one --
I have had less energy or felt tired because of my drinking.	-- choose one --
The quality of my work or school work has suffered because of my drinking.	-- choose one --
I have spent too much time drinking.	-- choose one --
I have neglected my obligations to family, work, or school because of my drinking.	-- choose one --
My drinking has created problems between myself and my boyfriend/girlfriend/spouse, parents, or other near relatives.	-- choose one --
I have been overweight because of drinking.	-- choose one --
My physical appearance has been harmed by my drinking.	-- choose one --
I have felt like I needed a drink after I'd gotten up (that is, before breakfast).	-- choose one --

Program Satisfaction Questionnaire (PSQ)

INSTRUCTIONS: Please rate your level of agreement with each of the following statements to indicate your level of satisfaction with the program you just completed. Circle one response for each item that best represents your level of agreement.

1) I would recommend this program to a friend.	Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree
2) The interview was thorough and complete.	Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree
3) The program seemed well organized.	Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree
4) The program was not confrontational.	Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree
5) The program made me think about my use of alcohol.	Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree
6) The program did not impose a particular choice about alcohol upon me.	Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree

7) What did you find *most useful* about the program?

8) What did you find *least useful* about the program?

VITA

Theodore Lee Wagener, M.S.

Candidate for the Degree of

Doctor of Philosophy

Thesis: A RANDOMIZED TRIAL COMPARING COMPUTER AND LIVE PERSONALIZED FEEDBACK INTERVENTIONS FOR HIGH-RISK DRINKING AMONG COLLEGE STUDENTS

Major Field: Psychology

Biographical

Education: Graduated *Cum laude* with a Bachelor of Arts in Psychology from the College of Wooster, Wooster, Ohio in May 2002. Received the degree of Master of Science from Oklahoma State University, Stillwater, Oklahoma in December 2005.

Experience: Completed a pre-doctoral practicum at the Cleveland Clinic Foundation, Child Study Center of the Oklahoma University Health Sciences Center, General Pediatric clinic of the Oklahoma University Health Sciences Center, and Laureate Psychiatric Hospital and Clinic.

Professional Memberships: Association for the Advancement of Behavior Therapy, American Psychological Association, The Obesity Society, Society of Behavioral Medicine, and the Oklahoma Psychological Association.

Name: Theodore Lee Wagener Date of Degree: July, 2010

Institution: Oklahoma State University Location: Stillwater, Oklahoma

Title of Study: A RANDOMIZED TRIAL COMPARING COMPUTER AND LIVE PERSONALIZED FEEDBACK INTERVENTIONS FOR HIGH-RISK DRINKING AMONG COLLEGE STUDENTS

Pages in Study: 89 Candidate for the Degree of Doctor of Philosophy

Major Field: Psychology

Scope and Method of Study:

The current study evaluated the efficacy of a computer-based personalized feedback intervention (PFI; Drinking Assessment and Feedback Tool for College Students, or DrAFT-CS) and a PFI with a live interviewer utilizing motivational interviewing strategies for reducing alcohol consumption and related problems for heavy-drinking college students. One hundred and fifty-two participants were randomly assigned to the DrAFT-CS, in-person PFI, repeated assessment, or a minimal assessment-only condition. Personalized feedback included the participant's typical/peak blood alcohol concentration, drinking quantity, frequency, and related problems, endorsed dependence criteria, financial and caloric cost of drinking, family history of alcohol use disorders, alcohol expectancies, psychological problems, and motivation to change.

Findings and Conclusions:

Results indicated that at 10-weeks posttreatment both the DrAFT-CS and in-person PFI significantly reduced alcohol consumption and related problems. The DrAFT-CS showed comparable efficacy to the in-person PFI and repeated assessment conditions but was superior to the minimal assessment-only condition.

ADVISOR'S APPROVAL: Thad R. Leffingwell, PhD.