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EVALUATION OF A DIGITALLY-AUTOMATED ALCOHOL CURRICULUM DESIGNED TO ALTER EXPECTANCIES AND ALCOHOL IN USE FIRST-YEAR COLLEGE STUDENTS

by

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M.S. University of Central Florida, 2010

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ABSTRACT

High-risk alcohol consumption remains a primary public health concern for students on college campuses. In response to this concern the National Advisory Council of the National Institute on Alcohol Abuse and Alcoholism created a task force to identify and recommend strategies to aid college administrators in implementing effective alcohol programming at their institutions. While most administrators report being aware of these recommendations, many have not successfully implemented empirically supported interventions on their campuses. One significant barrier is the cost and difficulty of training and hiring skilled staff to implement these interventions. Of the strategies identified as effective, challenging alcohol expectancies is the only strategy validated for group administration with college students and has significant potential to address this remaining barrier. However, current expectancy-based interventions still require highly trained expert facilitators for implementation. The present study aimed to convert the previously validated Expectancy Challenge Alcohol Literacy Curriculum (ECALC) into a digital format amenable to non-expert facilitation. The resulting digital ECALC was implemented in 48 class sections of a first year student course in a group randomized trial. It was hypothesized that receiving the digital ECALC would result in significant changes in alcohol expectancies and subsequent changes in alcohol use and related harms. Analyses revealed significant changes in both positive and negative expectancies following the digital ECALC, however no significant changes in alcohol consumption or alcohol-related harms were observed at a 30 day follow-up. Exploratory subgroup analyses revealed significant differences between experimental and control groups on average and peak drinks per sitting for classes receiving the digital ECALC during the fall semester only. Semester specific variables, environmental context,

and social influence variables may have contributed to the lack of behavioral changes in the overall sample following observed expectancy changes. This study represents an important development in expectancy-based interventions for college students as the digital format removed the need for an expert facilitator and maintained significant changes in expectancies. Future studies should focus on replication of these expectancy changes and on demonstrating subsequent changes in alcohol use and related harms. The present study also represents the first evaluation of a group-administered expectancy intervention to report on intra-class correlations which will aid future researchers in designing sufficiently powered studies going forward.

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INTRODUCTION

Alcohol consumption has repeatedly been recognized as the primary public health concern impacting students on college campuses. A 2012 report states that 36% of college students reported occasions of binge drinking (five or more drinks in the past two weeks) and 40% indicated that they had been "drunk" in the past 30 days (Johnston, O'Malley, Bachman, & Schulenburg, 2012). Although it is typical to find that 90% of individuals have tried alcohol before college (Dunn & Goldman, 1998), there is a significant increase in alcohol use in students' first year of college as compared to their use in the last three months of their senior year of high school (Fromme, Corbin & Kruse, 2008). In addition, college students engage in more high-risk drinking than their non-college attending peers making them a distinct risk group for alcohol-related harms (Johnston et al, 2012; Slutske et al., 2004). Alcohol use contributes to over 1,800 of their deaths, almost 700,000 assaults, and 97,000 cases of sexual assault or date rape among college students each year (Hingson, Zha, & Weitzman, 2009). Even with increased awareness and widespread prevention efforts to address the problem on college campuses nationwide, little change in high-risk drinking has been documented (Hingson et al., 2009; Wechsler et al., 2002).

The lack of reduction in alcohol related harms experienced by college students can be attributed to several obvious problems. Campus alcohol programming usually suffers from a lack of careful evaluation for effectiveness. In addition, research results on effective strategies have not been disseminated adequately, making the selection of appropriate strategies difficult. In response to the prevalence of risky alcohol use and lack of effective response among colleges and universities, the National Advisory Council of the National Institute on Alcohol Abuse and

Alcoholism created a task force to review the relevant research literature on alcohol interventions. The primary objective of the task force was to advise college administrators on effective program implementation and evaluation as well as provide recommendations for future research directions (National Institute on Alcohol Abuse and Alcoholism, 2002). The resulting recommendations were organized into tiers based on the interventions' focus on college students and the degree of empirical support. Tier 1 identified strategies that had empirical support specifically with college students, while Tier 2 strategies had empirical support for the general population but had yet to be implemented in college settings. Interventions that required further evaluation to establish effectiveness and those that had evidence of ineffectiveness were included in Tier 3 and Tier 4 respectively.

Overall, only three strategies met criteria for Tier 1 designation, and two of these strategies are intensive and time-consuming individual methods. The third Tier 1 strategy, challenging alcohol expectancies, was the only method that was validated for administration in a group setting. Similarly, a recent meta-analysis provided further support finding that expectancy challenge interventions are effective in changing expectancies and reducing drinking in a college student population (Scott-Sheldon, Terry, Carey, Garey, & Carey, 2012). As of 2010, approximately 80% of colleges and universities reported being aware of these recommendations, but only 50% were actively implementing an empirically supported intervention and of those only 38% were using expectancy challenge programs (Nelson, Toomey, Lenk, Erickson, & Winters, 2010). Even with increased awareness, the cost and difficulty of training and/or hiring adequately skilled staff to implement these effective strategies remains a significant barrier to widespread adoption. As the only group administered intervention, challenging alcohol expectancies hold significant potential to address this remaining barrier.

Alcohol expectancies refer to cognitive sets stored in memory about the affective and behavioral effects of alcohol. The mechanism through which expectancies influence drinking behavior has been explored through research investigating alcohol expectancies as memory processes. One theory developed from this approach characterizes expectancies as "nodes" within a symbolic network memory model (Dunn & Goldman, 1996, 1998, 2000; Goldman & Rather, 1993; Rather & Goldman, 1994; Rather, Goldman, Roehrich, & Brannick, 1992;). This model is proximity-based such that these nodes can be closely or distantly linked based on inherent meaning and learning history causing activation to proceed predictably between nodes (i.e. closer nodes more likely to co-activate, more distant nodes less likely) as alcohol-related stimuli salient to previously encoded material are encountered (Goldman, 1999; Rather & Goldman, 1994). Furthermore, it is theorized that the activation pattern of these nodes influences differential drinking behavior.

A series of studies have been completed that were designed to validate a memory model-based theory of expectancy function. In general, it was found that expectancies are best understood as information stored in memory and organized along two bipolar dimensions (Dunn& Goldman, 1996, 1998, 2000; Goldman, 1999; Rather et al., 1992; Rather & Goldman 1994). The first is a bipolar positive-negative dimension consistent with factor analytic studies representing expected positive and negative outcomes of drinking, while the second is an arousal-sedation dimension reflecting pharmacological effects of alcohol. The memory networks of heavy/high-risk drinkers and lighter drinkers have been found to vary predictably along these expectancy dimensions. More specifically, high-risk drinkers are much more likely to associate positive and arousing effects with alcohol consumption and they typically develop tightly packed

alcohol expectancy networks. Conversely, lighter drinkers are more likely to associate sedating

effects with drinking and have more spatially diffuse alcohol expectancy networks. Thus, when

presented with an alcohol stimulus (e.g., common drinking environments, the smell of alcohol,

seeing liquor bottles or beer cans), high-risk and heavier drinking individuals rapidly activate

positive and arousing alcohol expectancies, which is one mechanism that produces an urge to

consume alcohol. For light drinkers, however, associations are activated at a slower rate and they

are more likely to activate negative and sedating alcohol expectancies that typically inhibit actual

alcohol consumption (Dunn, Lau, & Cruz, 2000; Dunn & Goldman, 2000, Rather & Goldman,

1994).

There is a strong body of research demonstrating the influence of alcohol expectancies on

drinking behavior. In addition to the above differentiation between heavy and light drinking

adults (Rather & Goldman, 1994; Rather et al, 1992) studies have established that expectancies

are present in children prior to experience with alcohol (e.g., Dunn & Goldman, 1996; Kraus,

Smith, & Ratner, 1994), predict drinking initiation (Christiansen, Smith, Roehling, & Goldman,

1989; Stacy, 1997), differentiate light-drinking and heavy-drinking children and adults (Dunn &

Goldman, 1998, 2000), and mediate the influence of antecedent variables on alcohol use (Darkes

& Goldman, 1998; Goldman & Darkes, 1997; Sher, Walitzer, Wood, & Brent, 1991; Stacy,

Newcomb & Bentler, 1991).

Expectancy research most relevant to intervention strategies has focused on changing the

function of expectancy systems (e.g., changing likely activation patterns of expectancies) to

change alcohol use. In particular, experimental studies have been conducted to demonstrate the

manipulation of expectancies by undermining positive expectancies. Referred to as an

"Expectancy Challenge" (Darkes & Goldman, 1993, 1998; Dunn et al., 2000; Lau-Barraco &

Dunn, 2008) this approach involves the use of a simulated-bar environment recreated in a laboratory, where heavy drinking college students are served either alcoholic or non-alcoholic (placebo) beverages in a sociable atmosphere. Participants are told to expect a certain type of beverage, but that is not necessarily what they are served. They then must try to identify who received alcoholic beverages, including whether they themselves consumed alcohol. Participants' inability to make these identifications at levels beyond chance, serves to challenge their expectations of the effects of alcohol (Darkes & Goldman, 1993; Lau-Barraco & Dunn, 2008; Goldman, 1999).

Darkes & Goldman (1993; 1998) conducted studies using a three-session Expectancy Challenge intervention to validate the effectiveness of this approach and to further establish the casual relationship between alcohol expectancies and consumption. Using moderate to heavy drinking male college students, they were able to demonstrate significant decreases in their positive expectancies and corresponding decreases in drinking at a 2-week follow-up for participants in the intervention group as compared to controls. Using the same Expectancy Challenge protocol, Dunn et al. (2000) were able to replicate the effectiveness of this intervention and also demonstrate a clear connection between changes in memory processes and changes in alcohol use. Although women were included in this sample, changes in likely activation patterns and corresponding decreases in drinking were only demonstrated in men. In an attempt to address the limitation of a multi-session format and demonstrate generalizability, Lau-Barraco & Dunn (2008) adapted the Darkes & Goldman (1993, 1998) protocol to a single session intervention with additional content targeted to women. This modified protocol resulted in significant changes in expectancies and corresponding decreases in drinking across genders as compared to controls. While this was a crucial step in addressing many of the limitations of

earlier expectancy challenge studies, its utility as a pragmatic intervention strategy was still restricted to a simulated bar environment and required actual alcohol administration.

These studies and others provided substantial supporting evidence for the causal nature of alcohol expectancies and the effectiveness of expectancy challenge interventions for heavy drinking college students. Unfortunately, there were serious practical barriers to dissemination and widespread implementation. Although the concerns of a multi-session format were addressed with the introduction of the Lau-Barraco & Dunn (2008) single-session protocol, the necessity of a bar-laboratory setting made the Expectancy Challenge incompatible with broad implementation in educational institutions. For widespread utility of expectancy-based prevention strategies, effective interventions must be developed for delivery in typical settings. With this in mind, Cruz and Dunn (2003) successfully implemented a single-session, classroom-based strategy with elementary-school children. An interactive classroom exercise was designed to alter the expectancy processes of these students such that they demonstrated a higher likelihood of activation of negative and sedating expectancies following exposure to the expectancy modification alcohol prevention exercise. In a subsequent study, the modified Expectancy Challenge was then administered to a high school population and succeeded in altering positive expectations associated with alcohol use and in significantly decreasing alcohol consumption among males and females (Cruz, 2007).

With high-risk alcohol consumption being particularly problematic for college students (Hingson et al., 2009), a pragmatic expectancy-based intervention for this population could substantially reduce the harms experienced by college students as a result of alcohol use. In an effort to develop an effective classroom delivered Expectancy Challenge protocol for college students, the Cruz (2007) protocol was modified and tested in small college classes. Referred to

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as the Expectancy Challenge Alcohol Literacy Curriculum (ECALC), results included significant reductions in both alcohol consumption and positive alcohol expectancies among males and females in the college population as compared to controls (Sivasithamparam, 2008). While this small classroom Expectancy Challenge represents a cost-effective, brief, and validated strategy for reducing alcohol consumption in the college population, it posed some continued pragmatic concerns. The interactive classroom exercise designed to manipulate expectancy processes limited the number of students that could receive the curriculum at one time.

As small class sizes are becoming increasingly rare in larger universities, the interactive exercise was replaced with a personalized word list activity that made the protocol appropriate for classes of over 100 students. Evaluations of the large classroom ECALC revealed significant changes in expectancy processes as well as reduced alcohol consumption when implemented with the general college population as well as with the targeted-high risk group of fraternity members (Fried & Dunn, 2012; Schreiner, 2010). While this validated protocol greatly increased the curriculum's suitability as a college-wide intervention strategy, the necessity of expert facilitators remains an important limitation. The current curriculum requires the facilitator to have a high degree of knowledge in alcohol's pharmacology and the alcohol expectancy literature in order to deliver the protocol effectively. The training necessary to prepare facilitators is a remaining hindrance to implementation and adoption of the ECALC.

In the present study, the ECALC protocol was modified and converted into a digital format amenable to facilitation by non-experts after brief training. This digital ECALC protocol maintains the fundamental content of the ECALC with the addition of user friendly presentation aids to assist the delivery of crucial components, which currently require expert knowledge of expectancy theory. This study evaluated the sustained effectiveness of this digital protocol in

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altering expectancy processes and subsequent alcohol consumption among first year college students as compared to an attention-matched wait-list control group. Multiple studies indicate that alcohol use increases during this first year, and expectancies represent one of the strongest predictors of this increase (Borsari, Murphy, & Barnett, 2007; Del Boca, Darkes, Greenbaum, & Goldman, 2004; Greenbaum, Del Boca, Wang, & Goldman, 2005; Hartzler & Fromme, 2003; Slutske et al., 2004). In addition, first year students are more likely than older students to experience a number of alcohol-related harms including death, injury, and legal consequences (Borsari et al., 2007). Therefore, first year students represent and important target group for alcohol intervention efforts. It is hypothesized that the digital ECALC will be easily integrated into a first year college course and result in changes to alcohol expectancies and lower drinking and alcohol-related harms as compared to controls. If successful, the single-session digital ECALC can be developed for adoption in educational institutions as a potentially cost-effective, brief, and validated strategy for reducing risky alcohol consumption in the college population.

METHOD

Participants

Participants included 991 first year students enrolled in the "Strategies for Success in College" (SLS 1501) course sections at the University of Central Florida during the Spring, Fall and Summer semesters of the 2012-2013 academic year. This included 24 class sections in the Summer semester, 18 class sections in the Fall semester, and 6 class sections in the Spring semester. Class sections were randomly assigned to either the ECALC condition or an attention-matched wait-list control condition. Random assignment took place at the group level such that participants were nested within classes, and classes were randomized to condition.

Measures

Timeline follow-back drinking measure

A timeline follow-back procedure (Sobell & Sobell, 1992) was used to establish a typical alcohol consumption pattern for the 30-day period immediately prior to receiving the expectancy presentation, as well as for the 30-day period immediately following the presentation. The timeline follow-back procedure has well established reliability (r=0.76-0.98) and validity (Sobell & Sobell, 1992; Sobell, Sobell, Klajner, & Pavan, 1986; Tonigan, Miller, & Brown, 1997) and is the accepted and preferred method of self-reported retrospective alcohol use. Participants record their drinking on a calendar with self-identified historical reference points to enhance recall. This method has well-established psychometric properties, and allows for the collection of exact drinking data over a specified period of time as opposed to a less useful categorization of estimated drinking patterns. It also allowed for the calculation of estimated blood alcohol content using the following formula [(number of drinks/2 x (gender constant/ weight)] − (.017 x

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hours drinking). The gender constant (male = 7.5; female = 9) within the formula adjusts for biological differences impacting blood alcohol content (Matthews & Miller, 1979). This formula has been well-validated and identified as the most accurate when compared to breath measurements of alcohol intoxication (Hustad & Carey, 2005). Another advantage is the ability to look at drinking variations and potentially control for events associated with different levels of drinking.

Factor Model-Based Expectancy Measure.

Alcohol expectancies were assessed before and immediately after exposure to the digital ECALC presentation using the Comprehensive Effects of Alcohol Scale (CEOA; Fromme, Stroot, & Kaplan, 1993), a factor model-based expectancy measure which possesses sufficient internal consistency and temporal stability (range of r=0.53-0.81 for the different factors). The CEOA was chosen over the widely used Alcohol Expectancy Questionnaire (AEQ; Brown, Goldman, Inn, & Anderson, 1980) because it is shorter in length, includes negative expectancies and measures discrete expectancies as opposed to generalized expectancies.

In comparing the CEOA to the AEQ-Adolescent version, the CEOA explained more of the variance in quantity (28%) and an equal amount of variance in frequency (15%) of alcohol use (Fromme and D'Amico, 2000). The CEOA assesses both positive and negative anticipated effects of alcohol use through ratings on a 5-point value scale ranging from 1 *(bad)* to 5 *(good).* Scoring of the CEOA yields four positive subscales (Sociability, Tension Reduction, Liquid Courage, and Sexuality) and three negative subscales (Cognitive and Behavioral Impairment, Risk and Aggression, and Self-Perception). Although the AEQ has often been found to have the highest correlation with alcohol use among expectancy scales, the advantages of the CEOA for the present application were considered to be of greater importance. In addition, the CEOA has

been used successfully to measure significant changes in expectancies in previous Expectancy Challenge studies (Dunn et al., 2000, Fried & Dunn, 2012; Schreiner, 2010).

Drinking Related Consequences.

In addition to the above measures, participants were asked to provide demographic information as well as information about alcohol-related harms experienced in the past 30 days. The Brief Young Adult Alcohol Consequences Questionnaire (BYAACQ) is an alcohol-related harms measure that was chosen for this project for several reasons (Read, Kahler, Strong, & Colder, 2006). The measure has strong internal consistency (Cronbach's α of 0.83) and test-retest reliability (r= 0.86). Concurrent and predictive validity have also been demonstrated. The BYAACQ showed correlations with previously established measures (*r*=0.76-0.85) as well as predicted grade point average (r=0.29) at the semesters end (Read, Merrill, Kahler, & Strong, 2007). The BYAACQ is the preferred assessment tool for alcohol related consequences as it was developed specifically for college students and is the most comprehensive measure available for this population (Devos-Comby and Lange, 2008).

Procedure

Participants completed all study measures as well as received the digital ECALC or control presentation during their scheduled SLS class section. All class sections within a semester were time-matched such that students completed baseline measures, received their assigned presentation, and completed follow-up measures within the same week. This ensured that all participants in a semester were reporting on the same 30-day period at baseline and follow-up data collection. Trained facilitators collected measures and administered the

intervention in accordance with a scripted protocol for both the digital ECALC and control presentations.

Students completed an informed consent procedure in which they were asked to provide consent to participate. As both the digital ECALC and control presentation represented a piece of the SLS course curriculum, all students in attendance received the presentations. Students declining participation did not complete the research measures. As the only foreseeable risk from participation was the disclosure of sensitive information, especially for those under the legal drinking age, all collected information was done so anonymously such that no identifying information will be able to be linked to responses. Instead, participants self-generated a unique code through providing answers to innocuous questions unrelated to study content. This allowed for the matching of baseline and follow-up measures at study completion.

Phase 1

The first phase consisted of the administration of pre-assessment measures (demographic questionnaire, factor model-based expectancy measure, alcohol-related harms questionnaire, timeline follow-back measure), the facilitation of the digital ECALC or control presentation, and post-test measures (factor model-based expectancy measures). Assessment administration followed a scripted protocol to ensure consistency across facilitators, class sections, and condition.

Students in the ECALC condition received the digital ECALC protocol designed to increase their attention to the sedating effects of alcohol and undermine the anticipation of positive and arousing outcomes. The session began with the facilitators introducing themselves, obtaining informed consent and leading the participants through the timeline follow-back measure. The facilitators then lead them through an expectancy word list activity where the

participants were asked to circle all expectancies they experienced while drinking. With the support of a digital narrator, students were then presented with video, audio and print advertisements depicting arousing and sedating expectancies. The participants were then asked to identify the expectancy effects promoted in each advisement and to recognize the contradictions. The presentation goes on to discuss the pharmacological realities of alcohol as a depressant and some common misconceptions about its effect on individuals. Students were then asked to identify some effects consistent with this fact and taught to differentiate between the 'real' and 'expected' effects of alcohol. At the end of the presentation, they returned to the word list activity completed at the start of the session. Students participate in an activity were they cross off all the words they circled at the start of the presentation that are identified as 'expected' effects of alcohol, allowing them to process the information in a personalized manner.

Students in the attention-matched waitlist-control condition received a body image presentation that is similar to the ECALC in its length, interactive style, and use of video, audio, and print advertisements to challenge pre-existing beliefs. The focus of the control presentation was on challenging body image ideals using media literacy skills.

Phase 2.

The second phase took place four weeks following the Phase 1 administration. Students in the digital ECALC condition and attention-matched wait-list control condition were administered follow-up measures in their classroom. Upon completion of the follow-up measure, the control group received the digital ECALC protocol and the experimental group received the control presentation.

RESULTS

<u>Baseline Participant Characteristics</u>

All 48 participating SLS classes completed the study. Of the 991 participants who provided baseline data, 38 were deemed unreliable (e.g. reported over 100 drinks per sitting, gave same response for every expectancy item, or answered "I don't know" for most items) and 88 did not complete 1-month follow-up measures resulting in a final sample of 865 first year students. Due to the anonymous method of data collection, it was not possible to evaluate reasons for non-completion. Students were likely either absent from class the day of the follow-up data collection, had dropped or withdrew from the course at this later point in the semester, or simply chose not to participate. Chi-square analysis showed that the follow-up completion rate was not significantly different for summer (92%, n=42), fall (90%, n=35), and spring (88%, n=11) semesters (χ^2=2.42, p>.05). There was also no significant difference in completion rate for experimental (91%, n=44) and control (91 %, n= 44) group participants (χ^2=0.00, p>.05). There were no significant differences between completers and non-completers in gender, age, or ethnicity. Significant differences were found between completers and non-completers on alcohol-related harms, the cognitive and behavioral impairment CEOA subscale, and on all dependent drinking variables with non-completers less likely to endorse expectancies of cognitive-behavioral impairment and higher reported baseline drinking and related harms (see Table 1).

Screening for outliers was performed by examining descriptive statistics computed from alcohol use measures. The range for blood alcohol concentration variables clearly exceeded the fatal level for humans (e.g., BAC in excess of .40, Berger, 2000). However, the pattern of responses of participants who reported extreme amounts of alcohol consumption did not suggest

fabrication or inadequate attention and may have been due to the participants' overestimation of drinking, or underestimation of weight or consumption time. Therefore, it was concluded that participants were more likely to have overestimated their consumption, as the pattern of overestimation was consistent across their responses. To avoid losing these heaviest consumers from the data set, values found to be over 3 standard deviations above the mean were incrementally recoded to one unit above the next lowest value (Tabachnick & Fidell, 2007; Borsari et al., 2007). This applied to 17 participants at baseline (11 experimental & 6 control) and 13 participants at follow-up (8 experimental & 5 control). This incremental recoding allowed for preservation of the relative ordering of values within the sample as the highest reported values remained the highest but minimized the potential impact of extreme values on group means. Six of these participants reported values over 3 standard deviations at both time points while the remaining participants had values recoded at only one time point. No recoded value resulted in alterations to the direction of change from baseline to follow-up.

In order to evaluate potential baseline difference between experimental and control groups, participants were compared on demographic characteristics (age, gender, ethnicity) as well as baseline dependent measures (drinking variables, alcohol-related harms, alcohol expectancies). Results revealed no significant differences between groups for age [$F(1, 39.97)=1.82$, $p=0.19$], gender [$\chi^2=0.55$, $p=0.46$], mean blood alcohol content [$F(1, 42.28)=0.62$, $p=0.44$], peak blood alcohol content [$F(1, 42.88)=0..07$, $p=0.80$], average drinks per sitting [$F(1, 41.37)=0.71$ $p=0.41$], peak drinks per sitting [$F(1, 42.42)=0.09$, $p=0.73$], alcohol-related harms [$F(1, 37.77)=0.06$, $p=0.81$], or any of the alcohol expectancy subscales [Sociability, $F(1, 43.72)=0.00$, $p=0.98$; Cognitive Behavioral Impairment, $F(1, 44.76)=0.04$, $p=0.85$; Liquid Courage, $F(1, 42.75)=0.85$, $p=0.62$; Risk and Aggression, $F(1, 38.44)=0.00$, $p=0.99$; Sexuality,

F(1, 40.32)=0.89, *p*=0.35; Self-Perception, *F*(1, 36.97)=0.08, *p*=0.78; and Tension Reduction, *F*(1, 39.71)=2.35, *p*=0.13]. Analysis showed significant differences for ethnicity, (χ^2=17.45, *p*=0.002) as the experimental group had a higher proportion of participants identifying as Hispanic, while the control group had a higher proportion of participants identifying as Caucasian and African American. This is likely a result of randomization at the group level and may have occurred due to students self-selecting into their class section. Any impact on the results is likely minimal as class variation was taken into account in the analysis.

Participants ranged in age from 18 to 21 years with a mean age of 18.13. A majority of the sample was female (61%) and self-identified Caucasian (63%). Ethnicity of the sample was representative of the student population of the university. Demographic characteristics of comparison groups are provided in Table 2.

<u>Alcohol Expectancy Analysis</u>

Alcohol expectancy changes were evaluated using a series of mixed-model ANCOVA's with baseline expectancy subscale score as the covariate. Study condition (Digital ECALC and attention-matched waitlist control) was treated as a fixed effect while class section was included as a random effect. A Bonferroni correction for multiple comparisons was applied setting the alpha level at 0.007. Dependent variables consisted of subscale scores computed from responses to the Comprehensive Effects of Alcohol Scale (CEOA, see Table 4 for means and standard deviations). Results revealed the digital ECALC condition reported significantly lower subscale scores at post-test on the Sociability factor, [*F*(1, 50.97)=129.68, ICC=0.03, *p*<.001], the Liquid Courage factor, [*F*(1, 52.37)=44.68, ICC=0.02, *p*<.001], the Risk and Aggression factor, [*F*(1, 43.64)=18.19, ICC=0.03, *p*<.001], the Sexuality factor, [*F*(1, 49.21)=27.47, ICC=0.03, *p*<.001], and the Tension Reduction factor, [*F*(1, 36.09)=33.31, ICC=.01, *p*<.001]. The digital ECALC

condition reported significantly higher subscale scores at post-test on the Cognitive/Behavioral Impairment factor, [$F(1, 48.78)=24.04$, ICC=0.01, $p<.001$]. Subscale scores were not significantly different for the Self-Perception factor. See Table 3 for means and standard deviations.

Alcohol Use and Associated Harms Analysis

To evaluate changes in alcohol use and alcohol-related harms a series of mixed-model ANCOVA's with baseline values as the covariate were conducted. Study condition (Digital ECALC and attention-matched waitlist control) was treated as a fixed effect while class section was included as a random effect. Results revealed no significant group differences on basic alcohol use variables (mean BAC, peak BAC; average drinks per sitting; peak drinks per sitting), weekly alcohol variables (weekly BAC; weekly peak drinks per sitting), or on overall BYAACQ scores. Results summarized in Table 4.

Post-Hoc Exploratory Analysis

Due to the significant expectancy changes, further post-hoc analyses were conducted to explore the potential presence of drinking changes among subgroups. This included separate analysis of those participants who reported drinking at baseline, participants who reported no drinking at baseline, participants who were categorized as heavy and heavy/frequent drinkers at baseline, as well as separate analyses for each semester measured.

Results revealed no significant differences on drinking variables or alcohol-related harms at follow-up when looking at drinkers only, abstainers at baseline, or heavy and heavy/frequent drinkers at baseline (Presley & Pimentel, 2006). Analysis looking at the participants by semester showed no significant differences at follow up for the summer semester on mean BAC, average

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drinks per sitting, peak drinks per sitting, weekly peak drinks per sitting, or harms.. There was a significant difference for the summer on weekly peak BAC, [$F(1, 459)=5.34$, ICC=0.00, $p=0.02$], and a trend towards significance for peak BAC, [$F(1, 15.54)=4.47$, ICC=0.004, $p=0.051$], with the digital ECALC condition reporting higher drinking as compared to the control group. Results revealed no significant group differences for the spring semester on any alcohol use variables or related harms.

Analysis of the fall semester showed no significant differences on mean BAC, peak BAC, weekly peak BAC, or harms. However, significant differences were observed for average drinks per sitting, [$F(1, 13.65)=6.68$, ICC=0.004, $p=0.02$], peak drinks per sitting, [$F(1, 15.83)=4.79$, ICC=0.02, $p=0.04$], and weekly peak drinks per sitting, [$F(1, 13.03)=5.37$, ICC=0.01, $p=0.04$], with the digital ECALC condition reporting lower drinking as compared to the control group. Results of exploratory analyses summarized in Table 5 through 10.

DISCUSSION

The present study aimed to evaluate the effectiveness of a digitally facilitated classroom-based expectancy challenge intervention with first year students. The Expectancy Challenge Alcohol Literacy Curriculum (ECALC) is an empirically-based program designed to alter expectancy processes in order to reduce risky alcohol use. The ECALC has demonstrated effectiveness with both a general college population as well as with the targeted-high risk group of fraternity members (Fried & Dunn, 2012; Schreiner, 2010). A significant limitation of the ECALC format was its reliance on an expert facilitator to effectively deliver the intervention's didactic content. The present study sought to address this limitation through the development and evaluation of a digital ECALC intervention that does not require expert facilitators. Consistent with a priori hypotheses, the digital ECALC successfully altered alcohol expectancies in first year students. However, subsequent changes in drinking and alcohol-related harms were not observed.

The current findings support the effectiveness of the digital ECALC in altering expectancies as students who received the intervention displayed significant changes on six of the seven expectancy subscales measured. This included decreased endorsements of expectancies surrounding Sociability, Liquid Courage, Risk and Aggression, Sexuality, and Tension Reduction; as well as increased endorsement of expectancies of Cognitive-Behavioral Impairment. These significant changes are consistent with findings from previous ECALC iterations (Fried & Dunn, 2012; Schreiner, 2010; Sivasithamparam, 2008, 2010) indicating maintenance of the intervention's effects on expectancies after the digital modifications. The significant changes in positive expectancies are also reflective of the broader literature on

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expectancy challenge (EC) interventions for college students. In a recent meta-analysis, Scott-Sheldon and colleagues (2012) found that EC interventions for college students were effective in altering positive expectancies but not negative expectancies. Even more, researchers found that younger students tended to show less change on negative expectancies when exposed to EC intervention as compared to older students. Thus, an important implication of the present findings is the demonstrated effectiveness of the digital ECALC to significantly alter both positive and negative expectancies in a sample of first-year students. Negative expectancies may be a particularly important target for younger college students as they likely have less experience with negative alcohol-related outcomes and the reinforcement of negative expectancies may be protective against high-risk drinking behavior.

While the digital ECALC demonstrated effectiveness in altering expectancies, contrary to hypotheses no subsequent changes in mean BAC, peak BAC, weekly peak BAC, average drinks per sitting, peak drinks per sitting, weekly peak drinks per sitting, or alcohol-related harms were found. Given the large body of research supporting the causal link between expectancies and alcohol consumption, this is most likely reflective of the large proportion of non-drinkers and light drinkers in the sample. Previous research has shown that drinkers categorized as "light drinkers" experience a low level of negative consequences related to their alcohol use and are usually considered "low-risk" (Presley & Pimentel, 2006). As the main message and aim of the digital ECALC is not abstinence but instead reducing high-risk drinking, one would not necessarily expect to see a change in a population that is already engaging in low risk drinking patterns. This finding might also be indicative of a problem with restriction of range; students who drink less have less room to show decreases in drinking.

Another important consideration when evaluating the lack of drinking changes is the potential impact of the measurement and intervention context. The present study measured participants' expectancies pre- and post-intervention as a group in a classroom environment. Previous research has shown that environmental context influences participants' endorsement of alcohol expectancies such that those assessed in an alcohol-cued environment endorse more positive and less negative alcohol expectancies than those assessed in a neutral environment (LaBrie, Grant & Hummer, 2011; Monk & Heim, 2013a, 2013b; Wall, Hinson, McKee & Goldstein, 2001; Wall, McKee, & Hinson, 2000; Wiers et al., 2003). In a recent study, Monk & Heim (2013a) compared endorsed alcohol expectancies across both environmental context (lecture hall cues vs. bar cues) as well as social context (alone vs. with peer group). Consistent with prior research, results indicated that participants were more likely to endorse positive expectancies and less likely to endorse negative expectancies when assessed in an alcohol-cued setting. Interestingly, social context had a significant impact on expectancy endorsement as well, but only for those assessed in the alcohol-cued setting. The potential impact of the environmental context and its interaction with the social context may have implications for the present study's results. Drinking changes may not have been observed due to measured expectancy changes not generalizing to participants' actual drinking environment. It may be possible that when encountering alcohol-cued environments in the company of their peer group, context-specific expectancies not accessed during the intervention may be activated and subsequently impact consumption.

Social influence variables may represent another possible explanation for the observed expectancy changes without behavioral changes in the present study. Social influence variables (e.g. peer use, perceived social norms, modeling, etc.) have consistently been linked to alcohol

consumption, particularly in adolescent and college samples (Larimer, Turner, Mallett, & Geisner, 2004; Neighbors, Lee, Lewis, Fossos, & Larimer, 2007; Simons-Morton & Chen, 2006). While research seems to indicate that this causal link may be partially mediated by expectancy processes (Scheier & Botvin, 1997; Zamboanga, Schwartz, Ham, Hernandez Jarvis, & Olthuis, 2009), the influence of unique social factors may help to explain the lack of drinking changes seen in the present study. Wood, Read, Palfai, and Stevenson (2001) evaluated the mediational role of alcohol expectancies on social influence variables in college student drinking. They differentiated between "active" social influence, which was characterized as direct pressure or offers from peers to drink, and "passive" social influence, which included perceived social norms and the social modeling of alcohol consumption. Their results did not support a mediational role of alcohol expectancies for active social influence or perceived social norms indicating that these factors are unique contributors to drinking outcomes in college students. Similarly, Neighbors and colleagues (2007) found social norms to be one of the strongest predictors of alcohol consumption and related problems amongst college students. These social influence variables may have more of a direct impact on actual consumption for first year students as the transition from high school to college is often marked by new and shifting social networks. Social norms and active pressure to drink may have been more salient for participants despite measured changes in alcohol expectancies.

A final possibility is that absence of behavioral changes in the presence of expectancy changes in the present study resulted from a combination of a low proportion of high-risk drinkers, the functioning of context-specific expectancies, and the influence of social networks. This could also explain the pattern of results seen across previous ECALC implementations. The ECALC has shown consistent significant effects on altering alcohol expectancies, but changes

across measured drinking outcomes have been more variable (Fried & Dunn, 2012; Schreiner, 2010; Sivasithamparam, 2008, 2010). Of the previous implementations, Fried & Dunn (2012) were able to demonstrate the greatest decreases in alcohol consumption with significant changes across all measured drinking outcomes when targeting fraternity members. This implementation involved delivery of the ECALC to fraternity chapters in their fraternity houses. This sample not only included a high-proportion of high-risk drinkers, but it also potentially accounted for context-specific expectancy processes and social influence variables. The measurement and delivery of the intervention took place within a likely drinking environment while participants were surrounded by their probable social drinking network. With an entire social network experiencing the intervention together and having similar changes in expectancy processes, changes in drinking are less likely to be impacted by social influence variables. In other implementations, participants received the ECALC in classroom settings with peers that may or may not be a part of their social network. It would be expected that these samples would show less robust drinking changes. Future studies may benefit from targeting high-risk drinkers and providing them an intervention in a cued environment amongst their social network.

While a priori hypothesis and analysis revealed no differences in drinking behavior, exploratory subgroup analyses revealed significantly lower weekly peak BAC, average drinks per sitting, and peak drinks per sitting, for those who received the digital ECALC in the fall semester. However, students who received the digital ECALC in the summer semester reported significantly higher weekly peak BAC. These analyses are purely exploratory and caution should be used in their interpretation as the probability of a false positive effect increases with the number of subgroup analyses (Lagakos, 2006). However, this result may indicate that the intervention was only effective in producing hypothesized drinking changes with students

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enrolled in the fall semester. These results could be due to unique time related variations but also may be attributable to differences in the types of students enrolling in SLS classes each semester. A majority of study participants were enrolled during the summer semester as more sections are offered during that time. Students enrolled in the summer semester have less time between the end of high school and the start of their college year, are likely enrolled in fewer concurrent classes, may be more likely to struggle academically, or be different than students enrolled in SLS for the fall semester in other important ways. Likewise, students enrolled in SLS classes during the spring semester represented a small proportion of the sample as compared to the summer and fall semesters, and may have already completed a full academic semester. Future studies may benefit from targeting classes that offer a sufficient number of course sections within a single semester to reduce this variation.

Beyond the results specific to hypothesized outcomes, the present study represents an important advancement as it is the first evaluation of an expectancy challenge intervention to account for the group administration. When participants receive an intervention in a group setting, the assumption of independence of errors underlying most statistical tests is violated (Murray, 1998; Varnell, Murray, Hannan, & Baker, 2001). The dependencies of observations that develop between participants within a treatment group create an intra-class correlation (ICC), which even if very small will greatly inflate the Type 1 error rate if not taken into account in the analysis (Baldwin, Murray, and Shadish, 2005; Murray, 1998; Murray, Hannan, & Baker, 1996; Varnell et.al., 2001). In addition to taking into account the ICC, statistical tests for group delivered interventions should base degrees of freedom on the number of groups and not on the number of individual participants in the study. Simulation studies have shown that even when the ICC is negligible the Type 1 error rate will be inflated if degrees of freedom are not correctly

based on the number of groups (Baldwin et al., 2005; Murrayet al., 1996). The methodological importance of accounting for group administration is highlighted by Baldwin and colleagues (2005) who reviewed group administered treatments on a list of empirically-supported psychological treatments. They found that none of the studies supporting the efficacy of these treatments accounted for the group administration in their analyses and proceeded to apply adjustments based on varying estimates of ICC and corrected degrees of freedom. Based on the range of estimated ICC, the original number of empirically-supported treatments dropped, with 6-19 of the original 33 studies no longer having significant results after these statistical adjustments. While applying such corrections to prior expectancy challenge interventions is beyond the scope of the current study, it is important to consider the possibility that previously reported significant results may have been concluded in error due to failing to account for the group administration.

In order to best design a group-randomized trial with adequate power, estimates of the potential ICC can be vital (Murray et al., 2004). As such, another important implication of the current results is the measured ICCs presented for each of the dependent variables. These ICC's can be used to aid researchers planning evaluations of group expectancy challenge interventions with college students to ensure their design includes enough groups and participants to have sufficient power.

<u>Further Limitations and Future Directions</u>

There are important limitations to consider when interpreting the results. Firstly, the short-term assessment period limits the ability to establish whether measured changes in expectancies are maintained long-term. While previous research indicates that expectancy-based interventions for college students are unable to maintain reductions in behavioral outcomes (i.e.

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drinking frequency, amount, and problems) past a 4-week follow-up, there is evidence to support sustained changes in expectancies for longer time periods (Scott-Sheldon et.al., 2012). The brief 30-day follow-up period may also have hindered detection of a potential preventative effect of the digital ECALC given the significant variations seen in drinking over the course of the first year of college (Del Boca et al., 2004). While no group differences in drinking reductions were observed, lasting expectancy changes could have a protective effect for baseline abstainers and low-risk drinkers which may be difficult to detect over a brief 4-week follow-up. Future studies should evaluate the digital ECALC over a longer follow-up period to explore the maintenance of expectancy changes and the potential for preventative effects on alcohol consumption for low risk populations.

A second limitation to consider is that the results may not generalize beyond the study sample of first year students enrolled in SLS classes. Differences in the saliency of certain expectancies as well as in drinking experience may lead to different outcomes for samples including upperclassman and older students. The study sample also did not encompass all first year students at the university. While a large number of students participated, the sample was limited to students enrolled in SLS classes. This is a course targeted to first year students with the aims of developing skills to support increased academic success during the transition to a university setting. Therefore, students may be more likely to take the SLS course if they are at academic risk (whether self-identified or through advisement) during their initial semester and could represent a unique subset of first year students. Future studies should aim to replicate the expectancy changes seen within this sample with other groups of first year students as well as with other college student populations.

In sum, the current study is an important advance in expectancy based interventions for college students. The ECALC content was adapted into a digitally administered format and successfully integrated into a first year college student curriculum. The digital ECALC demonstrated robust expectancy changes after a one-time, brief intervention without the need for an expert facilitator and represents an essential step towards development of an easily adoptable and transportable intervention for college students. While limitations warrant continued efforts to establish behavioral changes and to replicate expectancy results, the current study lends support to feasibility of intervention and prevention strategies that target alcohol expectancies in college students. It also marks the first expectancy challenge evaluation to properly account for group administration in the design and the statistical analysis. The resulting intra-class correlations are important contributions to the field as group-administered expectancy challenge researchers can use these to inform power analyses and study design.

APPENDIX A. TABLES

Table 1. Group comparisons for Completers (n=865) and Non-Completers (n=88)

	Completers	Non-Completers		
	n(%)/M (SD)	*n(%)/M (SD)*	χ^2/F	*p*
Male gender	337 (38.96%)	37 (42.05%)	0.54	0.46
Female gender	528 (61.04%)	49 (55.68%)		
Age	18.13 (0.36)	18.17 (0.40)	1.00	0.32
Ethnicity				
Caucasian	548 (63.35%)	55 (62.50%)	4.63	0.59
Hispanic	147 (16.99%)	14 (15.91%)		
African American	113 (13.06%)	14 (15.91%)		
Asian-American	28 (3.24%)	0 (0.00%)		
Other	25 (2.89%)	4 (4.55%)		
Mean BAC	0.045(0.06)	0.064(0.08)	6.31*	0.01*
Peak BAC	0.075(0.11)	0.116(0.15)	10.27*	0.001*
Average Drinks per Sitting	2.72(3.09)	3.59(3.76)	5.87*	0.02*
Peak Drinks per Sitting	4.02(4.88)	5.91(6.83)	10.73*	0.001*
Harms	3.80(4.90)	5.00(5.15)	4.61*	0.03*
Sociability	26.40(5.12)	26.10(5.84)	0.25	0.62
Cognitive/Behavioral Impairment	28.82(5.21)	27.36(5.90)	5.39*	0.02*
Liquid Courage	13.92(3.70)	14.14(3.88)	0.25	0.62
Risk & Aggression	12.46(3.45)	12.32(3.27)	0.12	0.73
Sexuality	9.71(3.05)	9.95(3.52)	0.44	0.51
Self Perception	9.07(3.15)	8.75(3.37)	0.72	0.40
Tension Reduction	8.09(2.47)	8.07(2.74)	0.01	0.95

*Significant at alpha level .05

Table 2. Group comparisons for Experimental (n=432) and Control (n=433) at Baseline

	Experimental	Control	χ^2/F	*p*
Male gender	163 (37.73%)	174 (40.18%)	0.55	0.46
Female gender	269 (62.27%)	259 (59.82%)		
Age	18.11 (0.33)	18.15 (0.38)	1.82	0.19
Ethnicity				
Caucasian	254 (58.80%)	294 (67.90%)	17.45*	0.002*
Hispanic	95 (21.99%)	52 (12.01%)		
African American	51 (11.81%)	62 (14.32%)		
Asian-American	16 (3.70%)	12 (2.77%)		
Other	16 (3.70%)	13 (3.00%)		

*Significant at alpha level .05

Table 3. Alcohol Expectancy Changes Across Experimental and Control

	ICC	Experimental (*n=432*) M (SD)		Control (*n=433*) M (SD)		*df*	*F*	*p*	*d*
		Baseline	Post-Test	Baseline	Post-Test				
Sociability	0.03	26.39(5.19)	18.85(9.08)	26.41(4.94)	26.20(5.39)	1, 50.97	129.68	<.001*	1.65
Cognitive/Behavioral Impairment	0.04	28.82(5.11)	30.35(5.47)	29.15(5.20)	28.39(5.98)	1, 48.78	24.04	<.001*	0.52
Liquid Courage	0.02	14.02(3.69)	10.74(5.34)	13.76(3.70)	13.47(4.29)	1, 52.37	44.68	<.001*	1.08
Risk & Aggression	0.03	12.50(3.44)	10.44(4.33)	12.42(3.47)	12.07(3.77)	1,43.64	18.19	<.001*	0.67
Sexuality	0.03	9.71(2.98)	7.72(3.67)	9.63(3.09)	9.41(3.40)	1,49.21	27.47	<.001*	0.84
Self Perception	0.04	9.00(3.11)	8.35(3.24)	9.11(3.16)	9.17(3.46)	1, 41	5.62	.023	0.37
Tension Reduction	0.01	8.23(2.41)	6.80(3.02)	7.92(2.53)	8.05(2.72)	1, 36.09	33.31	<.001*	1.12

*Significant at alpha level .007

Table 4. Alcohol Use and Associated Harms Across Experimental and Control

	ICC	Experimental (*n=432*)		Control (*n=433*)		*df*	*F*	*p*	*d*
		M (SD)		*M (SD)*					
		Baseline	1-mth	Baseline	1-mth				
Mean BAC	0.01	0.048(.06)	0.046(.07)	0.041(.06)	0.044(.06)	1, 36.79	0.20	0.66	0.08
Peak BAC	0.02	0.077(.10)	0.075(.10)	0.071(.11)	0.069(.10)	1, 40.34	0.25	0.62	0.12
AvDPS	0.04	2.88(3.25)	2.66(3.22)	2.54(2.94)	2.69(3.16)	1, 39.75	0.10	0.75	0.01
PDPS	0.04	4.17(4.91)	3.91(5.01)	3.84(4.87)	3.84(4.89)	1, 41.01	0.01	0.91	0.02
Wk pBAC	0.02	0.042(.07)	0.042(.07)	0.041(.07)	0.039(.07)	1, 40.29	0.15	0.71	0.08
Wk PDPS	0.04	2.36(3.30)	2.27(3.26)	2.21(3.33)	2.20(3.24)	1, 41.98	0.00	0.99	0.03
Harms	0.05	3.80(4.81)	3.80(4.58)	3.53(4.68)	3.85(5.22)	1, 40.66	0.06	0.81	0.01

Note: AvDPS = average drinks per sitting, PDPS= peak drinks per sitting, Wk pBAC= weekly peak BAC, Wk PDPS= weekly peak drinks per sitting

Table 5. Alcohol Use and Associated Harms Across Experimental and Control: Baseline Drinkers Only

	ICC	Experimental (*n=259*) *M (SD)*		Control (*n=251*) *M (SD)*		*df*	*F*	*p*	*d*
		Baseline	1-mth	Baseline	1-mth				
Mean BAC	0.01	0.079(.07)	0.068(.07)	0.069(.07)	0.065(.07)	1, 28.69	0.22	0.64	0.13
Peak BAC	0.01	0.126(.11)	0.112(.11)	0.118(.12)	0.104(.11)	1, 32.54	0.47	0.50	0.24
AvDPS	0.01	4.68(2.96)	3.86(3.26)	4.22(2.69)	3.95(3.17)	1, 33.56	0.11	0.74	0.09
PDPS	0.03	6.75(4.65)	5.79(5.31)	6.37(4.81)	5.76(5.19)	1, 36.89	0.00	0.97	0.01
Wk pBAC	0.01	0.068(.08)	0.064(.07)	0.068(.09)	0.059(.08)	1, 30.62	0.33	0.57	0.22
Wk PDPS	0.03	3.83(3.47)	3.44(3.58)	3.67(3.62)	3.33(3.54)	1, 36.80	0.05	0.83	0.06
Harms	0.05	5.62(4.78)	5.58(5.27)	5.06(4.65)	5.61(5.70)	1, 37.41	0.05	0.83	0.01

Note: AvDPS = average drinks per sitting, PDPS= peak drinks per sitting, Wk pBAC= weekly peak BAC, Wk PDPS= weekly peak drinks per sitting

Table 6. Alcohol Use and Associated Harms Across Experimental and Control: Baseline Abstainers

	ICC	Experimental (*n=161*) M (SD) 1-mth	Control (*n=166*) M (SD) 1-mth	df	F	p	d
Mean BAC	0.00	0.012(.04)	0.012(.04)	1, 324	0.01	0.93	0.0
Peak BAC	0.00	0.016(.06)	0.017(.05)	1, 324	0.06	0.81	0.02
AvDPS	0.04	0.73(2.00)	0.80(1.97)	1, 30.12	0.11	0.75	0.08
PDPS	0.02	0.88(2.32)	0.95(2.31)	1, 30.41	0.09	0.76	0.09
Wk pBAC	0.00	0.007(0.02)	0.008(0.03)	1, 324	0.33	0.57	0.04
Wk PDPS	0.03	0.37(1.16)	0.51(1.62)	1, 18.80	0.74	0.40	0.25
Harms	0.00	0.87(2.39)	1.15(2.72)	1, 313	0.93	0.34	0.11

Note: AvDPS = average drinks per sitting, PDPS= peak drinks per sitting, Wk pBAC= weekly peak BAC, Wk PDPS= weekly peak drinks per sitting

Table 7. Alcohol Use and Associated Harms Across Experimental and Control: Heavy and Heavy & Frequent Only

	ICC	Experimental (*n=128*) M (SD) Baseline	1-mth	Control (*n=119*) M (SD) Baseline	1-mth	*df*	*F*	*p*	*d*
Mean BAC	0.02	0.114(.07)	0.095(.07)	0.110(.07)	0.092(.07)	1, 31.79	0.09	0.77	0.14
Peak BAC	0.01	0.191(.11)	0.156(.12)	0.194(.12)	0.152(.12)	1, 33.01	0.06	0.81	0.15
AvDPS	0.00	6.42(2.67)	5.35(3.40)	6.04(2.42)	5.30(3.12)	1, 245	0.02	0.89	0.02
PDPS	0.01	9.87(4.24)	8.27(5.84)	9.64(4.51)	8.19(5.39)	1, 41.46	0.01	0.92	0.06
Wk pBAC	0.00	0.114(.08)	0.095(.08)	0.118(.09)	0.094(.09)	1, 242	0.01	0.92	0.01
Wk PDPS	0.00	6.18(3.47)	5.21(4.00)	6.00(3.80)	5.10(4.00)	1, 245	0.05	0.83	0.03
Harms	0.002	7.98(4.79)	7.88(5.39)	6.91(4.92)	7.80(6.31)	1, 34.08	0.01	0.93	0.14

Note: AvDPS = average drinks per sitting, PDPS= peak drinks per sitting, Wk pBAC= weekly peak BAC, Wk PDPS= weekly peak drinks per sitting

Table 8. Alcohol Use Experimental and Control: Summer Semester

	ICC	Experimental (*n=228*) M (SD) Baseline	Experimental (*n=228*) M (SD) 1-mth	Control (*n=238*) M (SD) Baseline	Control (*n=238*) M (SD) 1-mth	*df*	*F*	*p*	*d*
Mean BAC	0.00	0.050(.06)	0.051(.07)	0.031(.05)	0.040(.06)	1, 459	3.11	0.08	0.17
Peak BAC	0.004	0.081(.10)	0.082(.10)	0.054(.10)	0.061(.09)	1, 15.54	4.47	0.051	0.85
AvDPS	0.03	3.12(3.31)	2.94(3.38)	2.06(2.61)	2.40(3.11)	1, 16.68	1.34	0.26	0.28
PDPS	0.03	4.49(4.79)	4.25(4.80)	3.01(4.04)	3.31(4.60)	1, 17.91	1.97	0.18	0.33
Wk pBAC	0.00	0.042(.06)	0.050(.07)	0.031(.07)	0.036(.07)	1, 459	5.34	0.02*	0.2
Wk PDPS	0.04	2.50(3.14)	2.71(3.37)	1.97(3.10)	1.74(2.84)	1, 17.43	2.67	0.12	0.48
Harms	0.03	4.38(5.04)	4.38(5.34)	3.44(4.84)	3.87(5.52)	1, 34.08	0.41	0.53	0.16

*Significant at alpha level .05
Note: AvDPS = average drinks per sitting, PDPS= peak drinks per sitting, Wk pBAC= weekly peak BAC, Wk PDPS= weekly peak drinks per sitting

Table 9. Alcohol Use Experimental and Control: Spring Semester

	ICC	Experimental (*n=46*) *M (SD)*		Control (*n=32*) *M (SD)*		*df*	*F*	*p*	*d*
		Baseline	1-mth	Baseline	1-mth				
Mean BAC	0.05	0.044(.06)	0.041(.06)	0.034(.04)	0.040(.05)	1, 4	0.05	0.83	0.03
Peak BAC	0.04	0.071(.09)	0.070(.10)	0.056(.06)	0.063(.08)	1, 4.05	0.15	0.72	0.13
AvDPS	0.14	2.72(3.08)	2.75(3.24)	2.50(2.49)	2.73(2.81)	1, 4.04	0.10	0.77	0.01
PDPS	0.12	3.97(4.90)	4.30(6.32)	3.73(3.94)	3.85(3.92)	1, 4.26	0.22	0.66	0.11
Wk pBAC	0.02	0.039(.06)	0.038(.07)	0.026(.04)	0.041(.05)	1, 3.63	0.02	0.91	0.12
Wk PDPS	0.10	2.26(3.23)	2.28(3.74)	1.84(2.40)	2.68(2.90)	1, 4.06	0.001	0.98	0.16
Harms	0.05	3.29(4.07)	3.64(4.33)	2.75(3.33)	2.53(3.24)	1, 2.61	0.83	0.44	0.46

Note: AvDPS = average drinks per sitting, PDPS= peak drinks per sitting, Wk pBAC= weekly peak BAC, Wk PDPS= weekly peak drinks per sitting

Table 10. Alcohol Use and Associated Harms Across Experimental and Control: Fall Semester

	ICC	Experimental (n=137) M (SD)		Control (n=143) M (SD)		df	F	p	d
		Baseline	1-mth	Baseline	1-mth				
Mean BAC	0.01	0.046(.07)	0.041(.07)	0.059(.07)	0.051(.06)	1, 15.79	1.41	0.25	0.39
Peak BAC	0.02	0.074(.11)	0.065(.11)	0.101(.12)	0.084(.11)	1, 16.52	1.93	0.18	0.33
AvDPS	0.004	2.57(3.18)	2.19(2.92)	3.27(3.35)	3.16(3.26)	1, 13.65	6.68	0.02*	1.23
PDPS	0.02	3.71(5.09)	3.25(4.85)	5.17(5.88)	4.70(5.39)	1, 15.83	4.79	0.04*	0.55
Wk pBAC	0.01	0.043(.08)	0.030(.06)	0.059(.08)	0.044(.08)	1, 14.50	2.84	0.11	0.50
Wk PDPS	0.01	2.19(3.55)	1.57(2.79)	3.04(4.00)	2.48(3.49)	1, 13.03	5.37	0.04*	0.73
Harms	0.06	3.29(4.07)	3.64(4.33)	3.84(4.68)	4.11(5.08)	1, 14.15	2.11	0.17	0.14

*Significant at alpha level .05
Note: AvDPS = average drinks per sitting, PDPS= peak drinks per sitting, Wk pBAC= weekly peak BAC, Wk PDPS= weekly peak drinks per sitting

APPENDIX B. INFORMED CONSENT

Digital Expectancy Challenge Alcohol Literacy Curriculum Study

Informed Consent Form

Principal Investigator: Michael E Dunn, PhD
Co-Investigator: Thomas Hall, LCSW

Sub-Investigator: Amy Schreiner, M.S.

Sponsor: U.S. Department of Education

Investigational Site: University of Central Florida

Introduction: Researchers at the University of Central Florida (UCF) study many topics. To do this we need the help of people who agree to take part in a research study. You are being invited to take part in a research study which will include about 500 students at UCF. You have been asked to take part in this research study because you are currently a UCF student that is a part of a class or organization that has agreed to make the opportunity to participate available to you. You must be 18 years of age or older to be included in the research study.

The people conducting this research include Michael E Dunn, PhD, a researcher and faculty member of the Psychology Department at UCF, as well as Thomas V. Hall, director of the UCF Alcohol and Other Drug (AOD) Prevention and Programming Office. Also, Amy Schreiner, M.S., a doctoral student in the clinical psychology program will be involved in this research under the supervision of Principal Investigator Michael E Dunn, PhD.

What you should know about a research study:
- Someone will explain this research study to you.
- A research study is something you volunteer for.
- Whether or not you take part is up to you.
- You should take part in this study only because you want to.
- You can choose not to take part in the research study.
- You can agree to take part now and later change your mind.
- Whatever you decide it will not be held against you.
- Feel free to ask all the questions you want before you decide.

Purpose of the research study: The purpose of this study is to investigate students' alcohol use behaviors and attitudes as beliefs about alcohol. The researchers hope to learn more about how information presented to college students about research findings focused on the effects of alcohol and media literacy may impact these behaviors, attitudes and beliefs.

What you will be asked to do in the study: Your participation will involve anonymously completing survey measures before and after receiving a presentation on media literacy and a summary of related research findings focused on the effects of alcohol. In the survey measures, questions will ask about alcohol use and related attitudes and behaviors. You can participate in completing these questions no matter what your own alcohol use history may be (never drinker, non-drinker, regular drinker, etc.). During the presentation, you will interact with trained facilitators that will guide you through the information. Lastly, one-month after the presentation, you will be asked to complete the survey measures again. You do not have to answer every question or complete every task. You will not lose any benefits if you skip questions or tasks.

Location: The study will be conducted in a number of classrooms or UCF organizations meeting locations as well as in a UCF Psychology Department lab (Room 138) during specified times.

Time required: We expect that you will be in this research study for 45-60 minutes for the initial presentation. The follow-up survey's you will be asked to participate in 1-month from the initial presentation will take approximately 15-30 minutes.

Funding for this study: This research study is being paid for by U.S. Department of Education.

Risks: There are no reasonably foreseeable risks or discomforts involved in taking part in this study. However, should you have an emotional reaction to any of the material presented, or concern specific to the content regarding your alcohol consumption, please notify the following resources for further services and information:

Alcohol & Other Drug Prevention & Intervention Services   Counseling Center
University of Central Florida   University Of Central Florida
Orlando, FL 32816-3330   Orlando, FL 32816-3330
407.823.0879   407.823.2811

Benefits:
We cannot promise any benefits to you or others from your taking part in this research. However, possible benefits include an increased understanding of alcohol's effects on the body as well as how the media influences our attitudes and beliefs about alcohol. You may also gain a greater understanding of research and the research process through your participation in this study.

Compensation or payment:
There is no compensation, payment or extra credit for taking part in this study.

Anonymous research: This study is anonymous. That means that no one, not even members of the research team, will know that the information you gave came from you.

Study contact for questions about the study or to report a problem: If you have questions, concerns, or complaints, or think the research has hurt you, please contact one of the investigators below:

Project Coordinator:	Principal Investigator:	Co-Investigator:
Amy Schreiner	Michael Dunn, Ph.D.	Tom Hall, MSW, LCSW
Dept. of Psychology	Dept. of Psychology	SDES
Amy.schreiner@ucf.edu	Michael.dunn@ucf.edu	Thomas.hall@ucf.edu
(407) 823-2522		(407) 823-0869

IRB contact about your rights in the study or to report a complaint: Research at the University of Central Florida involving human participants is carried out under the oversight of the Institutional Review Board (UCF IRB). This research has been reviewed and approved by the IRB. For information about the rights of people who take part in research, please contact: Institutional Review Board, University of Central Florida, Office of Research & Commercialization, 12201 Research Parkway, Suite 501, Orlando, FL 32826-3246 or by telephone at (407) 823-2901. You may also talk to them for any of the following:

- Your questions, concerns, or complaints are not being answered by the research team.
- You cannot reach the research team.
- You want to talk to someone besides the research team.
- You want to get information or provide input about this research.

APPENDIX C. TIMELINE FOLLOWBACK DRINKING MEASURE

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
August 20 *Add/Drop Ends* **Drinking** **Occasion:** # Drinks: _____ Over _____ hours	*21* *Classes begin* **Drinking** **Occasion:** # Drinks: _____ Over _____ hours	*22* **Drinking** **Occasion:** # Drinks: _____ Over _____ hours	*23* **Drinking** **Occasion:** # Drinks: _____ Over _____ hours	*24* **Drinking** **Occasion:** # Drinks: _____ Over _____ hours	*25* *Late Reg. Ends* **Drinking** **Occasion:** # Drinks: _____ Over _____ hours	*26* **Drinking** **Occasion:** # Drinks: _____ Over _____ hours
27 **Drinking** **Occasion:** # Drinks: _____ Over _____ hours	*28* **Drinking** **Occasion:** # Drinks: _____ Over _____ hours	*29* **Drinking** **Occasion:** # Drinks: _____ Over _____ hours	*30* **Drinking** **Occasion:** # Drinks: _____ Over _____ hours	*31* **Drinking** **Occasion:** # Drinks: _____ Over _____ hours	*September 1* *Fee Deadline* **Drinking** **Occasion:** # Drinks: _____ Over _____ hours	*2* *UCF vs.* *Villanova* **Drinking** **Occasion:** # Drinks: _____ Over _____ hours
3 **Drinking** **Occasion:** # Drinks: _____ Over _____ hours	*4* *Labor Day* **Drinking** **Occasion:** # Drinks: _____ Over _____ hours	*5* *Frat* *Recruitment* **Drinking** **Occasion:** # Drinks: _____ Over _____ hours	*6* **Drinking** **Occasion:** # Drinks: _____ Over _____ hours	*7* **Drinking** **Occasion:** # Drinks: _____ Over _____ hours	*8* **Drinking** **Occasion:** # Drinks: _____ Over _____ hours	*9* **Drinking** **Occasion:** # Drinks: _____ Over _____ hours
10 **Drinking** **Occasion:** # Drinks: _____ Over _____ hours	*11* *Patriot Day* **Drinking** **Occasion:** # Drinks: _____ Over _____ hours	*12* **Drinking** **Occasion:** # Drinks: _____ Over _____ hours	*13* **Drinking** **Occasion:** # Drinks: _____ Over _____ hours	*14* **Drinking** **Occasion:** # Drinks: _____ Over _____ hours	*15* **Drinking** **Occasion:** # Drinks: _____ Over _____ hours	*16* *Sports:* *UCF vs. USF* **Drinking** **Occasion:** # Drinks: _____ Over _____ hours

APPENDIX D. COMPREHENSIVE EFFECTS OF ALCOHOL MEASURE

The following section assesses what you would expect to happen <u>if you were under the influence of alcohol</u>.

If you do not drink alcohol, please answer questions based on your beliefs, knowledge, and understanding of the effects of alcohol.

Circle one option from disagree to agree – depending on whether you expect the effect to happen to you if you were <u>under the influence of alcohol</u>. These effects will vary, depending upon the amount of alcohol you typically consume.

<u>This is not a personality assessment</u>. We want to know what you expect to happen if you were to drink alcohol, not how you are when you are sober. Example: If you are always emotional, you <u>would not</u> circle agree as your answer unless you expected to become MORE EMOTIONAL if you drank.

<u>If I were under the influence of alcohol</u>:

1. I would be outgoing…………………………..... Disagree	Slightly Disagree	Slightly Agree	Agree
2. My senses would be dulled………………….... Disagree	Slightly Disagree	Slightly Agree	Agree
3. I would be humorous…………………………... Disagree	Slightly Disagree	Slightly Agree	Agree
4. My problems would seem worse.……………... Disagree	Slightly Disagree	Slightly Agree	Agree
5. It would be easier to express my feelings……... Disagree	Slightly Disagree	Slightly Agree	Agree
6. My writing would be impaired.…………………. Disagree	Slightly Disagree	Slightly Agree	Agree
7. I would feel sexy………………………………….Disagree	Slightly Disagree	Slightly Agree	Agree
8. I would have difficulty thinking.…………………. Disagree	Slightly Disagree	Slightly Agree	Agree
9. I would neglect my obligations.…………………Disagree	Slightly Disagree	Slightly Agree	Agree
10. I would be dominant.…………………………….. Disagree	Slightly Disagree	Slightly Agree	Agree
11. My head would feel fuzzy.……………………….Disagree	Slightly Disagree	Slightly Agree	Agree
12. I would enjoy sex more.…………………………Disagree	Slightly Disagree	Slightly Agree	Agree

<u>If I were under the influence of alcohol</u>:

13. I would feel dizzy.…………………………………. Disagree	Slightly Disagree	Slightly Agree	Agree
14. I would be friendly.……………………………….. Disagree	Slightly Disagree	Slightly Agree	Agree
15. I would be clumsy.……………..………………….. Disagree	Slightly Disagree	Slightly Agree	Agree
16. It would be easier to act out my fantasies……... Disagree	Slightly Disagree	Slightly Agree	Agree
17. I would be loud, boisterous, or noisy………….. Disagree	Slightly Disagree	Slightly Agree	Agree
18. I would feel peaceful.……………………………. Disagree	Slightly Disagree	Slightly Agree	Agree
19. I would be brave and daring.…………………….. Disagree	Slightly Disagree	Slightly Agree	Agree
20. I would feel unafraid.…………………………......Disagree	Slightly Disagree	Slightly Agree	Agree
21. I would feel creative.…………………………….. Disagree	Slightly Disagree	Slightly Agree	Agree

22. I would be courageous………………………….. Disagree	Slightly Disagree	Slightly Agree	Agree
23. I would feel shaky or jittery the next day……….Disagree	Slightly Disagree	Slightly Agree	Agree
24. I would feel energetic…………………………… Disagree	Slightly Disagree	Slightly Agree	Agree
25. I would act aggressively………………………… Disagree	Slightly Disagree	Slightly Agree	Agree
26. My responses would be slow………………….. Disagree	Slightly Disagree	Slightly Agree	Agree
27. My body will be relaxed…………………………Disagree	Slightly Disagree	Slightly Agree	Agree
28. I would feel guilty…………………………………Disagree	Slightly Disagree	Slightly Agree	Agree
29. I would feel calm………………………………… Disagree	Slightly Disagree	Slightly Agree	Agree
30. I would feel moody………………………………Disagree	Slightly Disagree	Slightly Agree	Agree
31. It would be easier to talk to people……………..Disagree	Slightly Disagree	Slightly Agree	Agree
32. I would be a better lover…………………………Disagree	Slightly Disagree	Slightly Agree	Agree
33. I would feel self-critical………………………….. Disagree	Slightly Disagree	Slightly Agree	Agree
34 I would be talkative……………………………… Disagree	Slightly Disagree	Slightly Agree	Agree
35. I would act tough………………………………… Disagree	Slightly Disagree	Slightly Agree	Agree
36. I would take risks………………………………… Disagree	Slightly Disagree	Slightly Agree	Agree
37. I would feel powerful…………………………….. Disagree	Slightly Disagree	Slightly Agree	Agree
38. I would act sociable……………………………… Disagree	Slightly Disagree	Slightly Agree	Agree

APPENDIX E. DEMOGRAPHICS MEASURE

Age: _____ years old

(Circle only ONE answer for each question below, except where noted otherwise)

Sex: Male   Female

Current Weight: _____ lbs

What is your CURRENT educational status?

Freshman   Senior

Sophomore   Post-Baccalaureate

Junior   Non-Degree Seeking

Have you completed AlcoholEDU?

Yes   No

Which answer BEST describes your ethnicity?
Caucasian/White   African-American/Black   Hispanic   Asian-American   Other

Which answer BEST describes your living situation?
Residence hall   University-affiliated off-campus   Fraternity/sorority
Independent house/apartment

With whom do you live? (circle all that apply)
Roommate(s)   Alone   Parent(s)   Significant other   Other (specify: _____)

Are you CURRENTLY in, or do you PLAN TO RUSH, a fraternity/sorority?
Yes   No

Are you CURRENTLY on an NCAA athletic team at the University of Central Florida?
Yes   No

Are you CURRENTLY participating in any club sports or rec leagues at UCF?
Yes   No

How many hours do you typically work at a job PER WEEK?   _____ hours
What is your FATHER'S highest level of education? (Circle ONE)
Less than High School   Associate's Degree (A.A. or A.S.)
Some High School   Bachelor's Degree
High School Diploma/GED   Master's Degree
Some College   Doctoral Level Degree (Ph.D, M.D., J.D.)

What is your MOTHER'S highest level of education? (Circle ONE)
Less than High School   Associate's Degree (A.A. or A.S.)
Some High School   Bachelor's Degree
High School Diploma/GED   Master's Degree
Some College   Doctoral Level Degree (Ph.D, M.D., J.D.)

APPENDIX F. ALCOHOL-RELATED HARMS MEASURE

Different things happen to people while they are drinking alcohol or as a result of their alcohol use. Some of these things are listed below. **Please indicate whether each has happened to you during the last 30 days while you were drinking alcohol or as the result of your alcohol use.**

Has this happened to you over the last 30 days?	(circle one)	
While drinking, I have said or done embarrassing things	**Yes**	**No**
I have had a hangover (headache, sick stomach) the morning after I had been drinking	**Yes**	**No**
I have often found it difficult to limit how much I drink	**Yes**	**No**
I have spent too much time drinking	**Yes**	**No**
I have felt very sick to my stomach or thrown up after drinking	**Yes**	**No**
I have not gone to work because of drinking, a hangover, or illness caused by drinking	**Yes**	**No**
I have missed classes at school because of drinking, a hangover, or illness caused by drinking	**Yes**	**No**
I have taken foolish risks when I have been drinking	**Yes**	**No**
I have been overweight because of my drinking	**Yes**	**No**
I have felt badly about myself because of my drinking	**Yes**	**No**
I have driven a car when I knew I had too much to drink to drive safely	**Yes**	**No**
I often have ended up drinking on nights when I had planned not to drink	**Yes**	**No**
I have passed out from drinking	**Yes**	**No**
My physical appearance has been harmed by my drinking	**Yes**	**No**
I have woken up in an unexpected place after heavy drinking	**Yes**	**No**

Has this happened to you over the last 30 days?	(circle 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	**Yes**	**No**
When drinking, I have done impulsive things I regretted later	**Yes**	**No**
My drinking has created problems between myself and my boyfriend/girlfriend/spouse, parents, or other near relatives	**Yes**	**No**
I've not been able to remember large stretches of time while drinking heavily	**Yes**	**No**
My drinking has gotten me into sexual situations I later regretted	**Yes**	**No**
I have become very rude, obnoxious, or insulting after drinking	**Yes**	**No**
I have performed poorly on a test or important project because of my drinking	**Yes**	**No**
I have had memory loss because of my drinking	**Yes**	**No**
I have had less energy or felt tired because of my drinking	**Yes**	**No**
I have felt like I needed a drink after I'd gotten up (that is, before breakfast)	**Yes**	**No**
The quality of my school work has suffered because of my drinking	**Yes**	**No**
I have neglected my obligations to family, or work because of drinking	**Yes**	**No**
I have neglected my obligations to school because of drinking	**Yes**	**No**
I have thought I might have a drinking problem	**Yes**	**No**

APPENDIX G. IRB APPROVAL LETTERS

Approval of Human Research

From: **UCF Institutional Review Board #1**
              FWA00000351, IRB00001138

To: **Michael E. Dunn** and Co-PI: **Thomas V. Hall**

Date: **March 22, 2011**

Dear Researcher:

On 3/22/2011, the IRB approved the following human participant research until 3/21/2012 inclusive:

Type of Review:	UCF Initial Review Submission Form
Project Title:	The Digital Generation: Leveraging Technology to Reduce High Risk Drinking
Investigator:	Michael E Dunn
IRB Number:	SBE-11-07534
Funding Agency:	U.S. Department of Education/TRIO(USDOE)
Grant Title:	The Digital Generation: Leveraging Technology to Reduce High-Risk Drinking (ID: 1050947), Funded Through Grant Competition CFDA84.184N Models of Exemplary, Effective and Promising Alcohol or Other Drug Abuse Prevention Programs on College Campuses.
Research ID:	1050947

The Continuing Review Application must be submitted 30days prior to the expiration date for studies that were previously expedited, and 60 days prior to the expiration date for research that was previously reviewed at a convened meeting. Do not make changes to the study (i.e., protocol, methodology, consent form, personnel, site, etc.) before obtaining IRB approval. A Modification Form **cannot** be used to extend the approval period of a study. All forms may be completed and submitted online at https://iris.research.ucf.edu .

If continuing review approval is not granted before the expiration date of 3/21/2012, approval of this research expires on that date. When you have completed your research, please submit a Study Closure request in iRIS so that IRB records will be accurate.

Use of the approved, stamped consent document(s) is required. The new form supersedes all previous versions, which are now invalid for further use. Only approved investigators (or other approved key study personnel) may solicit consent for research participation. Participants or their representatives must receive a copy of the consent form(s).

In the conduct of this research, you are responsible to follow the requirements of the Investigator Manual.

On behalf of Joseph Bielitzki, DVM, UCF IRB Chair, this letter is signed by:

Signature applied by Joanne Muratori on 03/22/2011 01:23:14 PM EST

Approval of Human Research

From: **UCF Institutional Review Board #1**
             FWA00000351, IRB00001138

To: **Michael E. Dunn** and Co-PI: **Thomas V. Hall**

Date: **January 08, 2014**

Dear Researcher:

On 1/8/2014 the IRB approved the following human participant research until 1/7/2015 inclusive:

Type of Review:	IRB Continuing Review Application Form
	Expedited Review
Project Title:	The Digital Generation: Leveraging Technology to Reduce High Risk Drinking
Investigator:	Michael E. Dunn
IRB Number:	SBE-11-07534
Funding Agency:	U.S. Department of Education/TRIO(USDOE)
Grant Title:	
Research ID:	1050947

The scientific merit of the research was considered during the IRB review. The Continuing Review Application must be submitted 30days prior to the expiration date for studies that were previously expedited, and 60 days prior to the expiration date for research that was previously reviewed at a convened meeting. Do not make changes to the study (i.e., protocol, methodology, consent form, personnel, site, etc.) before obtaining IRB approval. A Modification Form **cannot** be used to extend the approval period of a study.   All forms may be completed and submitted online at https://iris.research.ucf.edu .

If continuing review approval is not granted before the expiration date of 1/7/2015,
approval of this research expires on that date. When you have completed your research, please submit a Study Closure request in iRIS so that IRB records will be accurate.

In the conduct of this research, you are responsible to follow the requirements of the Investigator Manual.

On behalf of Sophia Dziegielewski, Ph.D., L.C.S.W., UCF IRB Chair, this letter is signed by:

Signature applied by Patria Davis on 01/08/2014 10:46:06 AM EST

IRB Coordinator

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