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Evaluation of an Internet-Based Alcohol Misuse Prevention Course for College Freshmen Findings of a Randomized Multi-Campus Trial

Mallie J. Paschall, PhD, **Tamar Antin, DrPH**, **Christopher L. Ringwalt, DrPH**, and **Robert F. Saltz, PhD**
Prevention Research Center (Paschall, Antin, Saltz), Pacific Institute for Research and Evaluation, Berkeley, California; the Pacific Institute for Research and Evaluation (Ringwalt), Chapel Hill, North Carolina

Abstract

Background—Internet-based alcohol misuse prevention programs are now used by many universities. One popular 2- to 3-hour online course known as AlcoholEdu for College is typically required for all incoming freshmen and thus constitutes a campus-level strategy to reduce student alcohol misuse.

Purpose—This is the first multi-campus study to evaluate the effectiveness of an Internet-based alcohol misuse prevention course.

Design—RCT with 30 universities: 21 entered the study in Fall 2007, nine in Fall 2008. Fifteen were randomly assigned to receive the online course and the other 15 were assigned to the control condition. The course was implemented by intervention schools during the late summer and/or fall semester. Cross-sectional surveys of freshmen were conducted at each university, beginning prior to the intervention in Spring 2008/2009; post-intervention surveys were administered in Fall 2008/09 and Spring 2009/2010.

Setting/participants—Public and private universities of varying sizes across the U.S. Random samples of 200 freshmen per campus were invited to participate in online surveys for the evaluation. Overall survey response rates ranged from 44% to 48% (M ≈ 90 participants per campus).

Intervention—The online course includes five modules; the first four (Part I) are typically offered in the late summer before matriculation, and the fifth (Part II) in early fall. Course content includes defining a standard drink, physiologic effects of alcohol, the need to monitor blood alcohol level, social influences on alcohol use, alcohol laws, personalized normative feedback, and alcohol harm-reduction strategies. Students must pass an exam after Part I to advance to Part II.

Main outcome measures—Past-30-day alcohol use, average number of drinks per occasion, and binge drinking.

Address correspondence to: Mallie J. Paschall, PhD, Prevention Research Center, Pacific Institute for Research and Evaluation, 1995 University Avenue, Suite 450, Berkeley, CA 94704. paschall@prev.org.

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Results—Multilevel intent-to-treat analyses indicated significant reductions in the frequency of past-30-day alcohol use (beta = –0.64, p<0.05) and binge drinking (beta = –0.26, p<0.05) during the fall semester immediately after completion of the course. However, these effects did not persist when assessed in the spring semester. Post-hoc comparisons suggested stronger course effects on these outcomes at colleges with higher rates of student course completion. No course effects were observed for average number of drinks per occasion or prevalence of binge drinking, regardless of the campus course completion rate.

Conclusions—This study provides initial evidence that the Internet-based alcohol misuse prevention course has beneficial short-term effects on hazardous drinking behavior among first-year college students, which should be reinforced through effective environmental prevention strategies.

Introduction

Heavy alcohol use and related problems such as drinking and driving continue to be prevalent among college students. A recent national study indicates that estimates for alcohol-related deaths among college students aged 18–24 years increased from 1,440 in 1998 to 1,825 in 2005, and that the majority of deaths could be attributed to driving after drinking.[1] From 1999 to 2005, the prevalence of past-30-day heavy or “binge” drinking increased from 42% to 45%, and the prevalence of driving after drinking in the past year increased from 26.5% to 28.9%.[1] Levels of heavy drinking and driving after drinking remained significantly higher among college students than among same-age peers who were not attending college.[1]

Many universities across the U.S. are now using web-based programs or courses to address this persistent problem.[2] Popular web-based programs such as AlcoholEdu for College are modeled on efficacious multicomponent interventions led by trained clinicians (e.g., Brief Alcohol Screening and Intervention for College Students or BASICs).[3] Such interventions typically include: personalized feedback to change normative beliefs about alcohol use, education about alcohols' effects on the brain and on behavior, risk awareness, challenges to expectations regarding the effects of alcohol use, and suggestions for alcohol-free activities and strategies to minimize alcohol-related harm.[3, 4] Although brief interventions such as BASICs with trained clinicians are now fairly well established, web-based interventions are still being developed and tested. Thus, questions remain about their potential for reducing student alcohol misuse and related consequences.

A number of RCTs have been conducted at the individual level to evaluate web-based programs such as e-CHUG[5] and MyStudentBody[6] with college students who have recently engaged in heavy drinking, and College Alc[7, 8] and AlcoholEdu for College,[9–11] which target all incoming freshmen. Findings of these studies are mixed, and suggest that online alcohol prevention programs may be most effective for students with a recent history of heavy alcohol use, although one recent experimental study at a single institution did find beneficial effects of AlcoholEdu for College on drinking behavior with a large sample of first-year students.[11] Very few studies have examined the effectiveness of web-based alcohol prevention programs that attempt to reach an entire population of students who may be at risk for alcohol misuse and related problems, and almost all studies to date have limited their assessments to the short-term effects (e.g., 30 days post-intervention) of such programs.

The present study was conducted to evaluate the popular Internet-based course known as AlcoholEdu for College, which was designed as a campus-level prevention strategy for incoming freshmen,[11, 12] and is now being used by over 200 universities. The online course was developed by Outside The Classroom and is typically required of all incoming

freshmen, which differentiates it from other web-based interventions (e.g., e-CHUG, MyStudentBody) that are typically used only for students with a recent history of heavy drinking. The course extends traditional educational approaches to prevent alcohol misuse by including normative feedback to correct student misperceptions about the acceptability and level of heavy drinking on campus, interactive exercises to challenge alcohol expectancies, and recommendations for strategies to reduce the likelihood of heavy drinking and related consequences (e.g., avoiding drinking games).

As the intervention is intended to be administered across an entire campus, the appropriate evaluation design is a randomized multi-campus design. Even if the developers' intent were different, the current common practice mitigates against research designs that employ within-campus RCTs, due to the potential for contamination across students. A randomized multi-campus design was used to determine whether the Internet-based course affects targeted behavioral outcomes, particularly binge drinking, among incoming freshmen during their first fall semester, and whether any observed effects would persist into the spring semester. It was hypothesized that students in colleges implementing the course would report lower levels of alcohol use and binge drinking than those in control schools, but that any course effects observed would be stronger in the fall than the spring semester. It was also hypothesized that at the institutional level, that a higher level of student participation in the course (i.e., percentage of incoming freshmen who complete the course) would yield larger intervention effects on targeted behavioral outcomes.

Methods

Design

The Internet-based course was evaluated as a campus-level prevention strategy using an RCT. Colleges eligible to participate in the study had never implemented the online course or any other type of online alcohol prevention program designed for all incoming freshmen, and expressed willingness to be randomly assigned to an intervention or control condition in the first year of the study. Participating schools also agreed to work with Outside The Classroom to implement the course if assigned to the intervention group, and to provide random samples of 200 freshmen students each semester to the Survey Sciences Group, an independent survey organization.

Thirty-two colleges were initially enrolled into the study over a 2-year period. Twenty-two schools were enrolled in Fall 2007, and the remainder in Fall 2008. Colleges were randomly assigned to the intervention or to the control condition (see Figure 1). Of the 16 schools assigned to the intervention condition, one did not fully implement the course due to the loss of its campus coordinator position, but was retained in the study. One of the other 15 intervention schools was lost to follow-up because it did not provide usable survey samples for all three waves of data collection. Of the 16 schools assigned to the control condition, one dropped out of the study prior to baseline data collection. Three waves of survey data were collected from the 30 remaining colleges, with 15 in each study condition. IRB approval was first given by the Pacific Institute for Research and Evaluation on November 15, 2007 and was renewed in subsequent years.

Internet-based Alcohol Misuse Prevention Course. The online alcohol misuse prevention course for college freshmen typically takes 2–3 hours to complete. Students typically complete Part I of the course in the late summer prior to the fall semester. Part I consists of a baseline survey and 4 modules: *Introduction, Getting the Facts*, *Deciding for Yourself*, and *Review and Exam*. Thirty to 45 days later, students are prompted by e-mail to complete Part II of the course, which consists of one module that includes review materials, some new content, and a follow-up survey.

Some of the content of the course is tailored to respond to students' drinking status and gender. For example, students who report high-risk drinking are provided with feedback using national statistics concerning the prevalence of alcohol use among college students to correct any misperceptions about this behavior.

Module 1 begins with an overview of the course, emphasizes why taking the course is important, and through a flash animation provides detailed information about a standard drink size in relation to different types of alcoholic beverages. Module 2 challenges students in regards to their perceptions of campus drinking norms and their knowledge of alcohol's effects on the brain and body, including discussion about blood alcohol concentration (BAC) and a BAC calculator exercise. Module 2 also provides information about alcohol laws and policies, including consequences of alcohol law violations, and gives students the opportunity to explore policies that are specific to their state. Module 3 encourages students to set academic, social, and health-related goals for themselves concerning their next year of college and to develop strategies to help them meet those goals. Students select among a number of harm-reduction approaches (e.g., setting a limit on drinks, planning for safe transportation) to develop a specific plan for themselves, which is then referenced in Part II of the program.

Module 3 also teaches students how to deal with alcohol problems that they may encounter with friends, like alcohol poisoning and drinking and driving. Module 4 consists of a course review and an exam. Finally, Module 5 (Part II) provides an opportunity for students to review and revise the plan that they developed in Part I, and includes constructive stress management strategies and recognizing alcohol abuse problems. Part II concludes with a final quiz.

Student Surveys

Contact information for random cross-sectional samples of approximately 200 first-year students aged ≥18 years were provided by the 30 colleges at the beginning of each semester. Spring surveys were conducted in March and April, and fall surveys were conducted in October and November. Students first received a survey invitation letter via U.S. mail with a $10 cashable check enclosed. The letter provided information about the study and how to log into the survey website with a unique personal identification number. Up to three e-mail reminders with similar information were sent to students if they had not yet logged into the survey website within the next 3 weeks. The survey took an average of 15 minutes to complete.

Measures

Alcohol use and binge drinking—Four past-30-day drinking measures were used for the study. Respondents were provided with examples of standard alcoholic drinks (i.e., 12 oz. can, bottle or glass of beer, 5 oz. glass of wine, 1 oz. shot of liquor) and were asked whether they had consumed any alcoholic beverages in the past year. Students who reported any past-year alcohol use were asked, “In the past 30 days, on how many days would you say you had at least one drink of beer, wine or liquor?” (response range 0–30) and “Of those last 30 days when you did drink an alcoholic beverage, on average, how many drinks did you usually have?” Respondents were also asked how many times in the past 30 days they had (1) five or more drinks in a row and (2) four or more drinks in a row within a 2-hour period, with six possible responses ranging from “Never” to “10 or more times”. Gender-specific binge drinking prevalence and frequency measures were created for men (5+ drinks) and women (4+ drinks) with response options coded as follows: “Never” = 0, “Once” = 1, “Twice” = 2, “3–5 times” = 4, “6–9 times” = 7.5, and “10 or more times” = 10.

Student demographic and academic characteristics—Respondents reported their age, gender, race/ethnicity (non-Hispanic white, black, Asian, Hispanic, other), place of residence (campus residence hall, fraternity or sorority house, off-campus apartment or house, at home with parents) and current or high school grade-point average. Because the majority (81%) of students were living in a campus residence hall or dormitory, place of residence was treated as a dichotomous variable (0 = other, 1 = dormitory).

College characteristics—College characteristics included geographic location (region of the U.S., urban/suburban versus small town), governance (public versus private), religious versus nonreligious, total undergraduate population, and percentage of undergraduate students who were white, male, in Greek organizations, and living on campus. Fall 2008/09 semester characteristics were used because the first wave of post-intervention data was collected during this semester, and because college characteristics could potentially confound the relationship between the online course and student drinking.

Data Analysis

Descriptive analyses were first employed to compare the characteristics of intervention and control schools as well as the baseline characteristics of the student samples. Multilevel linear and logistic regression analyses were conducted in HLM version 6.06 software[13] to examine the effects of intervention condition on outcome slopes for dependent variables. HLM software allowed us to conduct multilevel analyses while adjusting for clustering of student observations that were nested within each campus (intraclass correlations for alcohol-related outcomes ranged from .01 to .05) and sample nonresponse weights. Separate multilevel analyses were conducted to examine the Time × Condition effect from Spring 2008/09 to Fall 2008/09, and from Spring 2008/09 to Spring 2009/10. It was expected that any observed course effects found in the fall semester, immediately following course implementation, would attenuate by the spring semester.

A post-hoc analysis was also conducted to examine possible dosage effects based on the level of students' participation in the course at the institution level. The percentage of freshmen who completed both Parts I and II was used as the dosage measure. Time × Dosage effects on targeted outcomes were examined, controlling for college- and student-level covariates.

Results

Survey Response Rate

The overall survey response rate ranged from 44% to 48% (~ 90 respondents per school each semester). Because response rates were less than optimal, nonresponse weights were created to reduce the possibility of sample bias due to over- or under-representation of several demographic subgroups. Nonresponse weights were computed as ratios based on gender/ethnic breakdowns for the entire freshman classes at the universities, relative to analogous breakdowns from the survey respondent samples. Nonresponse weights were applied in preliminary descriptive analyses and in multilevel regression analyses.

College and Student Sample Characteristics

There were no significant differences between colleges in the intervention and control conditions with respect to geographic and demographic characteristics. As shown in Table 1, colleges in the intervention and control conditions were evenly distributed across the four U.S. regions, with the majority of schools in Midwestern and southern states. A somewhat larger number of control than intervention schools were located in urban or suburban settings. Equal numbers of colleges in intervention and control conditions were public and

religious institutions, and colleges in each condition were similar with respect to total undergraduate population size, as well as the percentage of undergraduates who were white, male, in Greek organizations, and living on campus in Fall 2008/09. The average Fall 2008/09 survey response rate was somewhat higher at control than intervention schools, but this difference was not significant.

Baseline (Spring 2008/09) survey sample characteristics are shown in Table 2. The mean age was 18.7 years, the majority of the students were female (55%) and white (71.3%), and were living in a campus dormitory (80.3%). The mean frequency of past-30-day alcohol use was 3.8 with an average of 2.9 drinks per occasion. The prevalence of past-30-day binge drinking was 40.3% and the mean frequency of past-30-day binge drinking was 1.3. Intervention and control schools were similar with respect to student demographic and behavioral characteristics.

Course Implementation

There was considerable variability across the 15 intervention colleges both in how the Internet-based course was implemented and the level of students' participation. One college was not able to fully implement the course because it lost its campus coordinator position; only one e-mail message was sent to first-year students to encourage them to take the course. Ten of the other 14 intervention schools used an implied mandate by instructing students to complete the course without imposing any consequences for those who failed to do so. The other four schools required students to take the course and penalized those not doing so (e.g., by not allowing them to register for classes).

Almost all of the colleges (13) administered Part I of the course during the late summer and Part II early in the fall semester. Course completion rates (# freshmen who completed course/total # freshmen × 100) ranged from 4% to 100% (M = 56%, SD = 30%). Intent-to-treat analyses were used to test the primary hypothesis concerning the effectiveness of the course on student drinking at the campus level, while recognizing that those results might underestimate the actual effectiveness of the course at the student level. Post-hoc comparisons were then employed to test whether course effects varied by level of student participation.

Multilevel Regression Analysis Results

As shown in Table 3, Time × Condition terms were significant for past-30-day alcohol use and binge drinking frequency as assessed during the fall semester immediately following course implementation, which indicates greater reductions in these behaviors among first-year students at intervention than at control schools (also see Figure 1). No course effects were observed for average number of drinks per occasion or any binge drinking (Time × Condition OR = 0.89, 95% CI: 0.69, 1.14) during the fall semester, nor were course effects observed for any of these outcomes during the following spring semester.

Table 4 displays results of post-hoc comparisons that assessed whether students' exposure to the online course was related to course effects. The 30 schools were divided into three groups as defined by levels of student participation: low (0%–29%, *n*=18), medium (30%–69%, *n*=6), and high (≥ 70%, *n*=6). Two dummy variables were created to contrast high and medium versus low levels of participation. As shown in Table 4, greater reductions in past-30-day alcohol use and binge drinking frequency during the fall semester were observed for colleges with high levels of student participation in the course than among those with the lowest levels of participation (also see Figure 1). No significant differences in these drinking behaviors were observed when colleges with a medium level of student participation were compared to those with a low level of participation. During the

subsequent spring semester, no significant differences were found in course effects by level of students' exposure to the program.

Discussion

This study was the first to use a randomized multi-campus design to evaluate one of the more popular Internet-based courses for incoming freshmen. Consistent with expectations, analysis results suggest that the course reduced the frequency of past-30-day alcohol use and binge drinking among first-year students at intervention schools relative to those at control schools during the fall semester immediately following course implementation. Post-hoc comparisons also suggest that the effects noted varied with the proportion of students in each school who completed the course. However, these effects did not persist in the subsequent spring semester, regardless of the level of student participation. Additionally, no significant effects were observed, in either of the two follow-up periods, for either the average number of drinks students' consumed per occasion or the prevalence of binge drinking.

It is possible that intent-to-treat analyses may have underestimated the actual effects of the Internet-based course at the student level due to the relatively low course completion rates at several of the intervention schools. It is notable, however, that 78% of the students at the intervention schools who responded to the fall surveys indicated that they had completed the course. Unfortunately, it was not possible for ethical reasons to corroborate students' responses to the survey question about completing the online course with official course completion records maintained by Outside The Classroom and the participating colleges.

The intent-to-treat design is undoubtedly conservative, but potential adopters of the online course should know that its impact on their campuses will depend on successful and widespread implementation. Although post-hoc comparisons do suggest stronger effects of the course at colleges with higher levels of student participation, it appears that those schools had higher baseline levels of past-30-day alcohol use and binge drinking (see Figure 1), which suggests the possibility of natural regression to the mean as an alternative explanation for observed reductions in these behaviors.

This study revealed the difficulty of motivating universities to require an Internet-based course for all incoming freshmen and to subject those who do not complete the course to meaningful sanctions. Outside The Classroom provided training and technical support to assist intervention schools with implementation, including recommendations for such sanctions. Half of the colleges that used a hard mandate in this study – that is, required their students to take it, and threatened or imposed sanctions if they did not - achieved a course completion rate of at least 70%, which may be compared to 36% of the colleges that used only an implied mandate. Findings of this study may therefore be helpful for motivating colleges to utilize a hard mandate if they hope to achieve meaningful reductions in hazardous drinking among their first-year students.

Our findings should also be considered in light of several other limitations. Survey response rates were less than optimal, which may have biased the results in unknown ways. Survey nonresponse weights were used in all analyses to mitigate this problem. Attrition from the study by two of the initially enrolled colleges - one each in the intervention and control groups - may also have biased the results, although Tables 1 and 2 indicate that random assignment did help to achieve similarity in baseline characteristics across groups. Additionally, student responses to survey questions may have been biased by social desirability (e.g., concern about reporting an illegal behavior) and/or recall error.

There are a number of related research questions to be addressed in future analyses with data collected for this study. For example, the study will investigate the possible mediating effects of psychosocial factors targeted by the course, including normative beliefs related to alcohol use. The study will also examine whether the online course affects alcohol-related problems, and the extent to which the course has interactive effects on student drinking outcomes when combined with other campus- or community-level strategies (e.g., policies restricting alcohol use on campus, working with local community agencies and neighborhood associations to enforce underage drinking laws).

Conclusion

This study represents the first multi-campus evaluation of an Internet-based course as a campus-level strategy to reduce hazardous drinking among incoming freshmen. Prior studies have shown higher rates of hazardous drinking among college students in general, and among freshmen in particular, during the fall semester,[14] indicating the need for effective prevention strategies that are timed to address this problem. Based on the findings, the online course appears to constitute a strategy for reducing hazardous drinking that is particularly appropriate for freshmen who are newly arrived on campus, at a time when they are at high risk for engaging in this behavior.

Lack of course effects in the following spring, however, suggests that by itself the course may be insufficient to sustain effects over time, or perhaps that its benefit is eventually overcome by students exposure to alcohol and peer drinking behavior. Indeed, all such programs should be offered in conjunction with environmental strategies, such as those recommended by the National Institute on Alcohol Abuse and Alcoholism Task Force,[15] that are designed to prevent and mitigate the harms associated with alcohol consumption on college campuses.

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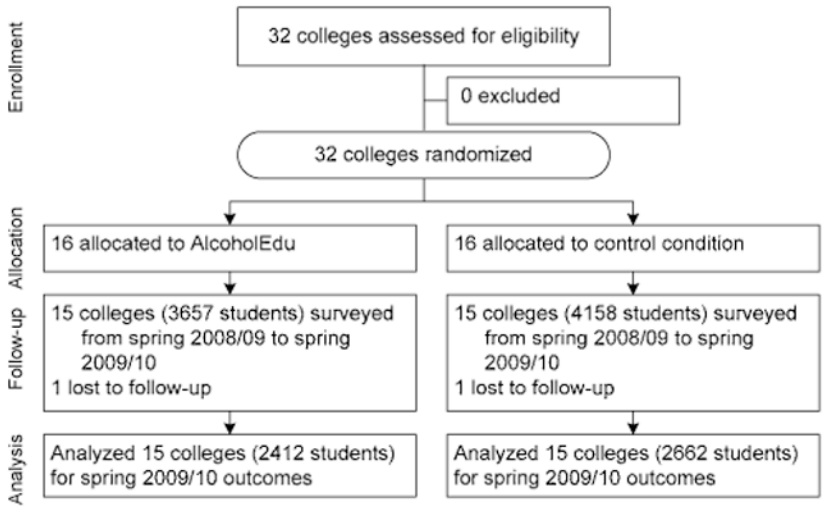

Figure 1. Consort flow chart illustrating study design

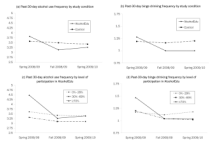

Figure 2.
Trends in the frequency of past-30-day alcohol use and binge drinking *Note:* Adjusted means, by study condition (a, b) and level of student participation in the online course (c, d)

Table 1
College characteristics, by study condition

Variable	Control Group (*n*=15)	Intervention Group (*n*=15)
Region		
Northeast	4	2
South	4	4
Midwest	5	7
West	2	2
Urban/suburban	11	7
Public university	8	8
Religious institution	4	4
Total undergraduate population, M (SD)	8491.47 (7685.8)	8489.9 (7269.1)
White, %, M (SD)	71.6 (20.1)	76.8 (12.9)
Male, %, M (SD)	46.4 (5.8)	43.7 (5.8)
Greek students, %, M (SD)	12.3 (11.2)	11.2 (7.9)
Living on campus, %, M (SD)	46.1 (26.5)	46.3 (24.8)
Survey response rate, M (SD)	51.4 (9.9)	45.2 (9.8)

Table 2
Baseline student sample characteristics, by study condition, % or M (SD)

Variable	15 control schools (*n*=1298)	15 intervention schools (*n*=1102)
Demographics		
Age (years)	18.6 (0.7)	18.8 (0.9)
Male	46.2	43.7
White	67.5	75.8
Hispanic	12.2	10.1
Asian	9.5	4.4
Black	4.7	6.0
Other race/ethnicity	4.7	3.3
Living in dormitory	80.5	80.0
Grade point average	3.2 (0.6)	3.2 (0.5)
Alcohol use, past 30 days		
Alcohol use frequency	3.6 (4.9)	4.0 (5.2)
Average number of drinks	2.8 (3.3)	3.1 (3.6)
Any binge drinking	38.6	42.3
Binge drinking frequency	1.2 (2.1)	1.3 (2.2)

Table 3

Effects of the online course on alcohol use and binge drinking during post-intervention fall and spring semesters, beta (SE)

	Post-intervention Fall Semester[a]			Post-intervention Spring Semester[b]		
Variable	**Alcohol use frequency**	**Avg. # drinks per occasion**	**Binge drinking frequency**	**Alcohol use frequency**	**Avg. # drinks per occasion**	**Binge drinking frequency**
Time × Condition	–.64 (.29)*	–.29 (.21)	–.26 (.10)*	–.17 (.16)	–.08 (.11)	–.11 (.08)
Time (1=baseline, 2=post-intervention semester	.10 (.18)	–.13 (.16)	.05 (.07)	–.08 (.11)	–.03 (.08)	–.005 (.04)
Intervention condition (0=control, 1=AlcEdu)	.87 (.66)	.25 (.38)	.33 (.18)	.17 (.62)	–.07 (.38)	.11 (.23)
Student covariates						
Age (years)	.29 (.13)*	.16 (.08)	.01 (.04)	.40 (.09)**	.13 (.06)*	.02 (.04)
Male	1.04 (.15)**	1.32 (.18)**	.64 (.08)**	.99 (.13)**	1.36 (.09)**	.60 (.06)**
White	–.02 (.37)	.36 (.23)	.02 (.19)	.07 (.30)	.54 (.19)**	.05 (.13)
Black	–1.76 (.63)**	–1.10 (.29)**	–.75 (.25)**	–1.99 (.40)**	–1.07 (.26)	–.79 (.18)**
Asian	–1.64 (.47)**	–.90 (.26)**	–.67 (.20)**	–.72 (.40)	–.52 (.26)*	–.55 (.18)**
Hispanic	–.17 (.39)	.21 (.23)	–.17 (.17)	–.22 (.35)	.21 (.22)	–.21 (.15)
Living in dormitory	.64 (.29)*	.59 (.14)**	.43 (.09)**	.56 (.20)**	.57 (.12)**	.31 (.09)**
Grade point average	–.97 (.19)**	–.62 (.09)**	–.31 (.06)**	–.96 (.11)**	–.61 (.07)**	–.34 (.05)**
College covariates						
Midwest region	–.45 (.32)	.12 (.16)	–.11 (.10)	.07 (.39)	.36 (.26)	.06 (.17)
Urban/suburban	.35 (.42)	–.24 (.24)	.03 (.14)	.22 (.49)	–.18 (.33)	.12 (.21)
Public institution	.21 (.97)	.17 (.50)	.08 (.32)	.20 (1.23)	.18 (.83)	.13 (.54)
Religious institution	.59 (.66)	.77 (.38)	.38 (.21)	.43 (.80)	.52 (.54)	.20 (.35)
Student population size	.0005 (.0004)	.0004 (.0002)	.0001 (.0001)	.0002 (.0004)	.0003 (.0003)	.0002 (.0002)
% white	.02 (.01)*	.01 (.006)*	.007 (.004)	.01 (.01)	.01 (.008)	.006 (.005)
% male	.005 (.04)	.01 (.02)	.009 (.01)	–.04 (.04)	–.01 (.02)	–.01 (.02)
% living on campus	.01 (.02)	.008 (.01)	.003 (.008)	.002 (.02)	.005 (.01)	.004 (.01)
% in Greek organization	.006 (.03)	–.004 (.01)	–.003 (.009)	.02 (.03)	.01 (.02)	.0005 (.01)
Survey response rate	–.02 (.02)	–.01 (.009)	–.007 (.006)	–.02 (.02)	–.01 (.02)	–.002 (.01)

[a] n=5,206 students;

[b] n=5,009 students;

* p<0.05

** p<0.01

Table 4

Summary of course participation-level effects on alcohol use and binge drinking during post-intervention fall and spring semesters, beta (SE)a

	Post-intervention Fall Semester[a]			Post-intervention Spring Semester[b]		
Variable	**Alcohol use frequency**	**Avg. # drinks per occasion**	**Binge drinking frequency**	**Alcohol use frequency**	**Avg. # drinks per occasion**	**Binge drinking frequency**
Time × High participation[b]	–0.89 (.44)*	–.53 (.36)	–.35 (.16)*	–.36 (.21)	–0.18 (.15)	–.15 (.08)
Time × Medium participation[b]	–0.04 (.24)	–.26 (.17)	–.18 (.10)	–.03 (.21)	–0.06 (.14)	–.06 (.08)
Time	–0.03 (.17)	–.12 (.14)	.02 (.06)	–.09 (.10)	–0.02 (.07)	–.02 (.04)
High participation level[b]	1.74 (1.0)	1.02 (.75)	.65 (.36)	1.19 (.80)	0.68 (.47)	.48 (.29)
Medium participation level[b]	–0.37 (.47)	.07 (.25)	.09 (.15)	–.65 (.81)	–0.30 (.49)	–.11 (.29)

[a] All student and college covariates indicated in Table 3 were included in the regression models.

[b] Colleges with low levels of course participation (0%–29% course completion rate) are the referent group. High participation level = ≥ 70%; medium participation level = 30%–69%.

* p<0.05

** p<0.01