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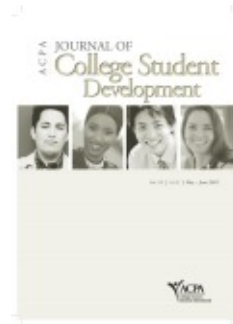
Did It Work? Examining the Impact of an Alcohol Intervention on Sanctioned College Students

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Universities often conduct alcohol interventions for individuals who have violated institutional, local, or state laws. Few of these programs have been evaluated thoroughly. This study examined the impact of a 10-hour alcohol education course on 400 college students whose attendance was required as part of a judicial sanction. The quasi-experimental study design had participants completing a pretest and posttest with a follow-up survey 3 months after completion of the program. Instruments designed for this study were used to examine alcohol use, perceived effects of alcohol use, risk of alcoholism, and negative consequences associated with use. Pre–post comparisons showed decreased quantity–frequency of alcohol use, reduced negative consequences, and increased perceived risk. However, only increased perceived risk continued 3 months after the intervention. Implications for practice are provided.

The pervasiveness of heavy episodic alcohol use on college campuses resulted in national recognition of binge drinking as the number one public health problem affecting college students in the 1990s (Wechsler, Lee, Kuo, et al., 2002). Negative consequences from alcohol and drinking rates have remained consistently high despite ongoing prevention efforts like the Fund for the Improvement of Post Secondary Education (FIPSE) grant program (Licciardone, 2003). More than 40% of U.S. college students reported binge drinking (defined as consumption of at least four drinks in a row for women, or at least five drinks in a row for men) on one occasion during the previous two weeks (Wechsler, Lee, Kuo, et al.). This high-risk alcohol use contributes to numerous negative outcomes, including 500,000 unintentional injuries, 70,000 sexual assaults, and 600,000 physical assaults annually among students aged 18 to 24 years (National Institute on Alcohol Abuse and Alcoholism, 2002).

To address this issue, most campuses have established alcohol education and intervention programs designed for the entire student population. These programs may include policy revisions, web-based education, face-to-face workshops, and social norms media campaigns. Many programs are atheoretical with little evidence of their efficacy (Moskowitz, 1989). A review of college alcohol program evaluations from 1984 to 1999 indicated that most traditional methods of prevention—information dissemination, values clarification, and providing normative binge drinking rates—did not demonstrate any effect on alcohol use or alcohol-related negative consequences (Larimer & Cronce, 2002; Walters & Bennett, 2000). One exception to this finding may be *PRIME for Life: Campus* (*PFL:C*; formerly called "On Campus Talking About Alcohol"), an educational program developed by the Prevention Research Institute in

Lexington, Kentucky, which has demonstrated some efficacy. One study indicated that 30% of individuals with high-risk alcohol consumption (defined as four or more drinks any day in the past 4 weeks) had adopted a low-risk drinking behavior pattern (never exceeding three drinks on any day in the past 4 weeks) after the intervention compared to only 19% of the control group. The program also appeared to have a stronger impact on those individuals with a family history of alcohol problems; 22% of those with family history of alcoholism adopted low-risk drinking behaviors after the intervention, compared to only 7.5% of the control group (Sammon, Smith, Cooper, & Furnish, 1991). Another evaluation of *PFL:C* showed few changes in attitudes about alcohol use but did demonstrate more behavior change among high-risk drinkers than low-risk drinkers 60 days after the intervention (Sammon, Webster, Rayens, Clayton, & Leukefeld, 1994). This impact may be attributed to the fact that *PFL:C* includes personalized risk-reduction guidelines based on individual risk factors in addition to general alcohol awareness information (Larimer & Cronce). This is consistent with evidence that attitudinal and skill-based interventions may have a moderate effect in reducing drinking behaviors (Walters & Bennett).

Although many alcohol interventions are directed toward all students, other interventions are designed for individuals who have incurred an alcohol violation either through a university judicial process or as a result of a criminal charge. Statistics from numerous colleges and universities indicate that the number of alcohol arrests among U.S. college students has increased steadily since 1981 (Barnett & Read, 2005). Students who violate alcohol policies appear to engage in more high-risk use of alcohol than their peers and be at greater risk for alcohol abuse (Caldwell, 2002; O'Hare, 1997) and academic problems (LeMay, 1968).

Congruent with the increase in the number of violations, the number of college-imposed interventions has also increased (Wechsler, Lee, Nelson, & Kuo, 2002).

Although the number of interventions for these sanctioned students has increased, reviews indicate a dearth of quality research on campus strategies regarding mandated interventions (Barnett & Read, 2005; Larimer & Cronce, 2002). Many of the evaluations of university-sanctioned programs have methodological limitations (e.g., posttest only, combining mandated and voluntary students, not measuring behavioral outcomes), small sample size, and other concerns (Barnett & Read). Of the programs that have conducted rigorous evaluations, those interventions that include personalized feedback and brief motivational interventions seem to have some level of efficacy with this population (Barnett et al., 2004; Barnett & Read; Borsari & Carey, 2005; White et al., 2006).

This project seeks to add to the knowledge base through a student development lens about the impact of interventions targeted toward students who have committed an alcohol violation. Conducted at a large public research university in the Southeast, the purpose of this study is to examine the effectiveness of *PFL:C,* a group intervention program with a component of personalized feedback, for individuals who were sanctioned as a result of a local or campus alcohol policy violation. Specifically, the study addresses the following research questions:

> Does this alcohol education program affect student drinking behaviors?
>
> Does this alcohol education program affect problems associated with drinking?
>
> Does this alcohol education program increase an individual's understanding of his/her own risk of developing alcoholism?

If behavior changes do occur, are they sustained 3 months after the intervention?

METHODS

This evaluation design was quasi-experimental; participants completed a pretest (survey I), a posttest (survey II), and a follow-up survey (survey III) 3 months following the completion of the intervention to examine any changes in behavior and attitudes as a result of the intervention. Students were given survey I by a research assistant prior to the commencement of instruction on the first day of the program. Upon completion of the intervention, students were given survey II prior to their departure from the classroom. Three months after the completion of the intervention, students were sent an e-mail from the researchers requesting their participation in a second posttest (survey III) that was administered online. Students were sent two e-mail reminders for the online survey. Students who completed all three surveys were placed in a drawing each month for a $40 or $50 gift certificate to the university bookstore. Individuals under 18 years of age were asked not to complete the survey. The Institutional Review Board for Human Subjects gave approval for the survey and procedure. This manuscript focuses primarily on the results of surveys I and II.

Participants

Individuals who participated in *PFL:C* on this campus between May 2003 and November 2004 were asked to participate in the evaluation. Of the 493 students who participated in the program during this time frame, 411 individuals completed a survey. This yielded a response rate of 83.4%; however, 11 participants were voluntarily taking the program, so the final number of participants for survey I was 400. Of those 400, 259 completed both survey I and II and 79 completed surveys I, II, and III.

Most participants who completed survey I were men (64.8%, *n* = 259) compared to women (35.0%, *n* = 140) with one individual not identifying gender. Most were White (90.8%, *n* = 363) and under the age of 21 (85.3%, *n* = 341). One third of the participants (33.3%, *n* = 133) had at least one parent or grandparent with alcoholism. This was the first alcohol-related sanction or arrest for most participants (79.8%, *n* = 319). Fifteen percent of individuals (*n* = 60) had been sanctioned or arrested two times, and 4.1% (*n* = 16) had been sanctioned or arrested three or more times.

Other characteristics about the participants included the cost of the violation and their grade point average (GPA). For most participants, the violation had a financial component. Only 5 participants reported no financial expenses related to their violation; the maximum amount was $8,006 for fines, legal fees, etc. The mean was $817.13 and the median was $440. Of those individuals who chose to respond, the mean cumulative GPA was 3.19 (out of 4.0), and for the previous semester the mean grade point average was 3.24 (out of 4.0).

Students were also asked about the quantity–frequency of their drinking prior to the violation. Quantity–frequency refers to the amount of alcohol consumed on drinking days (quantity) and how often drinking days occur (frequency). Of those who answered the question, the average number of days of drinking in the 2 weeks prior to the violation were 4.31 days (*SD* = 2.86) with a range of 0 to 14 days. Regarding the number of drinks consumed in the 2 weeks prior to violation, the range was 0 to 110 drinks with a mean of 27.57 (*SD* = 25.40) and a median of 20. Respondents were also asked to provide the date of their violation so that the time between the violation and the beginning of the sanction could be determined. The length of time between the violation and the beginning of

TABLE 1.

Participant Demographics

Variable	Survey I $n = 400$		Survey II $n = 259$		Survey III $n = 79$	
	%	n	%	n	%	n
Gender						
Male	64.8	259	61.4	159	49.4	39
Female	35.0	140	38.6	100	50.6	40
Missing	0.3	1	0.0	0	0.0	0
Race/Ethnicity						
White	90.8	363	91.1	236	88.6	70
Black	2.3	9	1.5	4	1.3	1
Hispanic/Latino/a	1.3	5	1.5	4	1.3	1
American Indian/Alaska Native	0.5	2	0.8	2	1.3	1
Asian/Pacific Islander	2.3	9	1.9	5	2.5	2
Other	2.5	10	2.7	7	3.8	3
Missing	0.6	2	0.4	1	1.3	1
Age[a]						
18 years old	23.3	93	22.4	58	11.4	9
19 years old	37.0	148	40.2	104	40.5	32
20 years old	25.0	100	22.4	58	25.3	20
21 years old	11.8	47	12.7	33	20.3	16
22 years old	1.0	4	0.4	1	0.0	0
Above 22 years old	1.4	5	1.2	3	1.3	1
Missing	0.8	3	0.4	1	1.3	1
Mean	19.36 years		19.34 years		19.67 years	
Median	19.00 years		19.00 years		19.00 years	
Standard Deviation	1.17		1.17		1.35	

[a] Age was asked at each survey administration.

the intervention ranged from 9 to 695 days with an average of 111 days (SD = 99.17) and a median of 79 days. The demographic characteristics of the participants remained consistent across all three survey administrations with the exception of gender. There were significantly fewer males who completed all three surveys than females, $\chi^2(2, N = 399)$ = 10.97, $p < .01$ (see Table 1 for frequencies).

Although almost 65% of participants completed survey II, there was a high level of attrition among participants for survey III. Only 19.75% completed all three surveys.

Intervention

This study was conducted on a large, land- and sea-grant, research university in the Southeast. In 1986-87, this university was chosen as a

pilot site for *PFL:C*. The workshops have continued to be offered several times a year; however, minimal evaluation about its effectiveness had been conducted on this campus. Most of the evaluation has been process orientated and included personal testimonies about the impact. Evaluations of *PFL:C* available from the Prevention Research Institute demonstrated a positive impact on participants (Prevention Research Institute, 2006, n.d.); however, none of these studies examined the impact on sanctioned individuals. One study with an experimental design of random and control groups had been conducted with dental students in the early 1990s (Sammon et al., 1991).

The premise of *PFL:C* is that, to prevent alcohol problems, students need more than advice to "drink responsibly" or "drink moderately." "Just being told to 'drink moderately' without being given any specific definition has encouraged people to measure 'moderate' in comparison to their own experience or by what other people in their group do" (Daugherty & O'Bryan, 2004, p. 53). Because high-risk drinking choices can be dangerous, precise information about low-risk drinking choices is crucial. *PFL:C* was designed to teach people how to estimate their own biological risk and provide specific research-based, low-risk guidelines that reduce the risk of alcohol or drug-related health or impairment problems at any point in life.

On this campus, students found in violation of the Student Code of Conduct and/or the law because of an alcohol- or drug-related incident are required to complete *PFL:C.* During the years of the intervention, the campus alcohol policy stated in the Student Code of Conduct was:

> State law prohibits possession or consumption of alcoholic beverages by those under the legal drinking age and prohibits making alcoholic beverages available to

persons under the legal drinking age. The university supports a program of alcohol education and expects those who choose to use alcohol to do so responsibly. [This would prevent individuals from] the use, possession, or sale of alcoholic beverages as permitted by law and university policy; providing or facilitating the use, possession or distribution of alcoholic beverages except as permitted by law and university policy; disruptive or disorderly conduct caused by the influence of alcohol and/or other drugs; the use, possession, or distribution of narcotic or other controlled substances except as permitted by law; and providing or facilitating the use, possession, or distribution of narcotic or other controlled substances except as permitted by law. (University of Georgia, 2004)

On-campus referrals may come from hearing officers in the Office of Judicial Programs or the Department of Housing. Students referred to *PFL:C* from campus officials must complete the program by a certain date as part of their sanction. If students fail to comply, then a hold is placed on their student account, and they are unable to register for classes. Community referrals most often come from the municipal court system. In these cases, students are required to complete *PFL:C* as part of the pretrial diversion program. If these students fail to comply, then they may be found in violation of probation.

PFL:C is a 10-hour program presented in four sessions, 2.5 hours each. The program is coordinated by the Health Promotion Department housed in the University Health Center. All sessions are facilitated by health educators, who have undergone the Prevention Research Institute's requisite training to become certified instructors of *PFL:C*. Because the information is sequential, students must attend all four sessions sequentially. The first session addresses three areas: (a) commonly held views about

alcohol problems, (b) research-based information that either validates or invalidates these views, and (c) discussion about how the interaction between biology and choices influences the outcome of lifestyle-related health problems. Session two describes individual factors that increase the risk of impairment problems. This session also explores social and psychological influences on a person's choices and identifies specific quantity and frequency guidelines for alcohol consumption and other drug use based on an individual's genetic risk. The third session examines behaviors, characteristics, and typical outcomes of the drinking continuum (from experimental use to alcoholism). Participants also explore ways to live with low-risk choices in a high-risk environment. The fourth session encourages students to explore the costs and benefits of high-risk drinking choices; examines the relationships among choices, outcomes, and values; and assesses students' readiness to make low-risk choices (Daugherty & O'Bryan, 2004). At this campus, the final session concludes with a comprehensive test to ensure that students are attentive and retaining the information. Individuals must earn an 80% to pass the test, and approximately 97% of all participants pass the test. Students who comply with the class regulations (e.g., attending all four sessions in sequence, arriving to class on time, and passing the test) earn a certificate of completion, which is signed by the instructor. Students then present the certificate of completion to the appropriate referring agency. Students who complete *PFL:C* do not earn academic credit toward degree completion or fulfillment of graduation requirements.

Instrumentation

Two instruments were used for this data collection: the Alcohol Sanction Evaluation Pretest Survey (Shutt & Oswalt, 2003a) and the Alcohol Sanction Evaluation Posttest

Survey (Shutt & Oswalt, 2003b). These surveys (surveys I and II) were created specifically for this project to address the components of the intervention. Participants could have been surveyed up to three times, once with the Alcohol Sanction Evaluation Pretest Survey (survey I) and twice with the Alcohol Sanction Evaluation Posttest Survey (surveys II and III).

Many of these items were taken directly from the Core Alcohol and Drug Survey and National College Health Assessment (NCHA) with permission. Any items used from these surveys were used verbatim with the identical ranking schemes of the original instrument. Both of these instruments have been used repeatedly in national assessments and have well-established reliability and validity. For the Core Alcohol and Drug Survey, initial development of the instrument involved content validity and the reliability measures for the items that are considered adequate (Presley, Meilman, & Lyerla, 1993). For NCHA items, the analyses included multiple comparisons (e.g., relevant percentages, item reliability analysis, construct validity analysis, and measurement validity analysis) with nationally representative databases (American College Health Association [ACHA], 2004). Neither of these surveys were used in their entirety, because they are lengthy, contain items not relevant to the intervention, and do not address the specific objectives of the intervention. This study protocol analyzes individual items and does not consider the instrument or any group of items as scales; as such, standardized reliability coefficients are not reported. Test–retest reliability coefficients for interval response categories for this sample range from 0.71 to 0.50.

In order to compare results over time, 18 identical items were included on all surveys. These items addressed the following areas: current alcohol use (past 2 weeks), perceived

effect of alcohol use, risk of alcoholism, negative consequences, and two demographic items.

Current alcohol use was addressed by three items. Two items were open ended: the number of days alcohol was consumed and the number of drinks consumed over the past 2 weeks. One item asked where the participants consumed alcohol most frequently in the past 2 weeks. Respondents could choose one of the following options: off-campus house/apartment; residence hall, fraternity or sorority house, family and graduate housing, bar or restaurant in county, bar or restaurant outside county, other (and fill in a response), or did not consume alcohol in the past 2 weeks.

Two items addressed the perceived effect of alcohol use. Specifically, these items were: "How many drinks can you consume on one occasion without experiencing any negative consequences?" and "How many days per week can you drink without experiencing any negative consequences?"

PFL:C addresses one's personal biological risk for negative consequences from alcohol use. Part of that assessment includes family history of alcoholism, which has been extensively documented as a risk factor for alcohol problems (Quickfall & el-Guebaly, 2006). Because this is a critical message of the intervention, two items addressed this issue. One asked, "Do you have one or more parent(s) or grandparent(s) with alcoholism?" (yes/no response); the other item asked individuals to indicate on a 5-point Likert-type scale how much they agreed (from *strongly agree* to *strongly disagree*) with the following statement: "I am at risk for alcoholism."

Nine items addressed negative consequences. One item asked how many times the participant had been arrested or sanctioned for violating state law, federal law, or university policy with regard to alcohol. The remaining eight items asked participants to indicate how often they had experienced one of eight negative consequences in the past 2 weeks. These consequences were: memory loss (blackouts), missed a class, experienced a hangover, performed poorly on test or important project, got into an argument or fight, got nauseated or vomited, driven a car while under the influence, and been hurt or injured/had unexplained injury. Possible answers for these eight items were: never, once, twice, three to five times, and six or more times.

The remaining two items were demographic items: age and email address. The email address was used to track participants and contact them for the second administration of Alcohol Sanction Evaluation Posttest Survey (survey III).

The previously discussed 18 items were the only items on the Alcohol Sanction Evaluation Posttest Survey (surveys II and III). The Alcohol Sanction Evaluation Pretest Survey (survey I) had 15 additional items, for a total of 33 items. These additional items addressed the type of sanctions received, the date by which the sanction was to be completed, the date of the violation, the cost of the violation, and behaviors before the violation (quantity and frequency of drinking and most frequent drinking location). Survey I also contained demographic questions about the participant: gender, ethnic origin, living arrangements, university classification, cumulative GPA, and GPA for the last semester.

RESULTS

To answer the first three research questions, matched responses of the 259 individuals who completed survey I and survey II were compared. Because the type of data collected varied, both parametric procedures and nonparametric procedures were conducted. Paired *t* tests were conducted to examine changes in quantity–frequency alcohol use and

TABLE 2.

Paired *t* Test for Survey I and Survey II

Variables	Survey I	Survey II	N	Mean Difference	t
Number of days alcohol consumed in last 2 weeks	3.43	2.96	241	0.47	3.39*
Number of drinks consumed past 2 weeks	23.48	18.24	251	5.24	3.90**
Perceived number of drinks s/he can have on one occasion without negative consequences	5.96	5.29	255	0.67	4.34**
Perceived number of days s/he can drinks without negative consequences	2.77	2.58	246	0.19	2.12***

*p = .001.   **p < .001.   ***p < .05.

perceived level of quantity–frequency that will not result in negative consequences. Nonparametric procedures were used to examine differences in the frequency of negative consequences. Missing data were eliminated pairwise. Prior to any analyses, outliers were removed from the dataset and continuous variables were checked for normality with the values of skewness and kurtosis acceptable for the sample size.

There were statistically significant differences in responses about the number of drinks consumed in the past 2 weeks between survey I and survey II (23.48, *SD* = 29.96, compared to 18.24, *SD* = 20.29, respectively). Similarly, the number of days alcohol was consumed in the past 2 weeks differed. At survey I, participants consumed alcohol on more days than at survey II (3.43 days, *SD* = 3.00, versus 2.96, *SD* = 2.50). Changes in the students' beliefs from survey I to survey II about the number of drinks they can consume and the number of days they can consume alcohol without negative consequences were also compared using paired *t* tests. At survey I, participants believed they could consume an average of 5.96 drinks (*SD* = 3.36) without negative consequences compared to believing that they could drink 5.29 (*SD* = 2.80) at survey II. Likewise, the number of days participants

reported believing they could drink without negative consequences decreased from survey I to survey II (2.77, *SD* = 1.51, to 2.58, *SD* = 1.34). The differences for all four of these variables were significant; specific results including means, mean differences, test statistics, and *p* values can be found in Table 2.

Eight questions asked how frequently the participant had experienced negative consequences in the previous 2 weeks. Because the response categories for these data were ordinal, the sign test was used to compare individuals' responses between survey I and survey II. Individuals reported significantly different levels on four of these negative consequences: missed a class (z = –2.05, p < .05), performed poorly on a test or important project (z = –2.27, p < .05), nauseated or vomited (z = –1.98, p = .05), and driven a car while under the influence (z = –2.38, p < .05). None of the other negative consequences—memory loss, experienced a hangover, got into an argument or fight, and been hurt or injured/had unexplained injury—were significantly different.

The third research question addressed the impact of the intervention on one's understanding of alcoholism. Individuals responded on a 5-point Likert-type scale (*strongly agree* to *strongly disagree*) about their own risk of alcoholism. Matched *t* tests were used to

compare results from survey I (M = 3.32, SD = 1.21) and survey II (M = 2.56, SD = 1.14). Individuals were significantly more likely to believe they were at risk for alcoholism after the intervention (mean difference = .74, $t(258)$ = 11.25, $p < .001$).

Lasting Impact

In order to determine whether the effect of this intervention was longstanding, individuals were asked to participate in a follow-up survey (survey III) 3 months after the completion of the intervention. Of the 259 participants who completed survey II, 79 opted to complete all or part of survey III. To examine if these changes were sustained over the three survey administrations, additional analyses were performed. Repeated ANOVA methods were used to examine the interval data. For these analyses, Mauchly's sphericity test was examined first. In two cases, it was violated and as a result, the Huynh-Feldt correction is reported. Friedman's two-way ANOVA was used to examine the nonparametric data, specifically the questions about the frequency of negative consequences.

For individuals who completed all three surveys, the average number of drinks consumed in the past 2 weeks declined over the three surveys: 20.85 (SD = 27.62) drinks for the pretest, 17.84 (SD = 20.09) for the posttest, and 16.44 (SD = 18.94) at the 3-month follow-up. However, there were no significant differences between responses, $F(2, 120)$ = 1.65, $p > .05$, η_p^2 = .03. The average number of days in the past 2 weeks that the participants consumed alcohol actually increased from pretest to the follow-up 3 months later. Initially at the pretest, individuals averaged 3.34 (SD = 2.63) days of drinking in the past two weeks. At the posttest, this average had dropped to 2.94 ($4SD$ = 2.46); however, at the follow up, there was an increase to 3.44 (SD = 2.47) days. There was no significant

difference between these responses using Huynh-Feldt correction, $F(1.57, 87.83)$ = 1.53, $p > .05$, η_p^2 = .03.

Individuals were also asked about the number of drinks they can consume on one occasion without negative consequences. Seventy-six individuals responded to this item on all three surveys and the average number of drinks from those respondents was 5.65 (SD = 3.32) on the pretest, 5.03 (SD = 2.78) on the posttest, and 4.61 (SD = 2.47) on the 3-month follow-up. There was a significant difference between these responses, $F(2, 150)$ = 6.06, $p < .01$, h_p^2 = .08. The post-hoc analyses were adjusted for multiple comparisons using the Bonferroni method and showed a significant difference between the pretest and 3-month follow-up (mean difference = –1.05, $p < .01$). The number of days the respondents believed they could consume alcohol without negative consequences increased slightly from the pretest average of 2.45 (SD = 1.25) to 2.67 (SD = 1.34) at the posttest and 2.88 (SD = 1.69) at the 3-month follow up. This change was not significant using Huynh-Feldt correction, $F(1.67, 119.91)$ = 2.86, $p > .05$, η_p^2 = .04. Figure 1 depicts these results.

Friedman's two-way ANOVA was used to examine the frequency of negative consequences for each of the survey administrations. Table 3 reports the frequency of responses for each category. There were no significant differences in reported frequency of any of the eight negatives consequences (i.e., memory loss, missed a class, experienced a hangover, performed poorly on test or important project, got into an argument or fight, got nauseated or vomited, driven a car while under the influence and been hurt or injured/had unexplained injury).

Repeated ANOVA procedures were also used to compare risk of alcoholism over the three surveys. The means for the three surveys were 3.32 (SD = 1.19), 2.61 (SD = 1.20), and
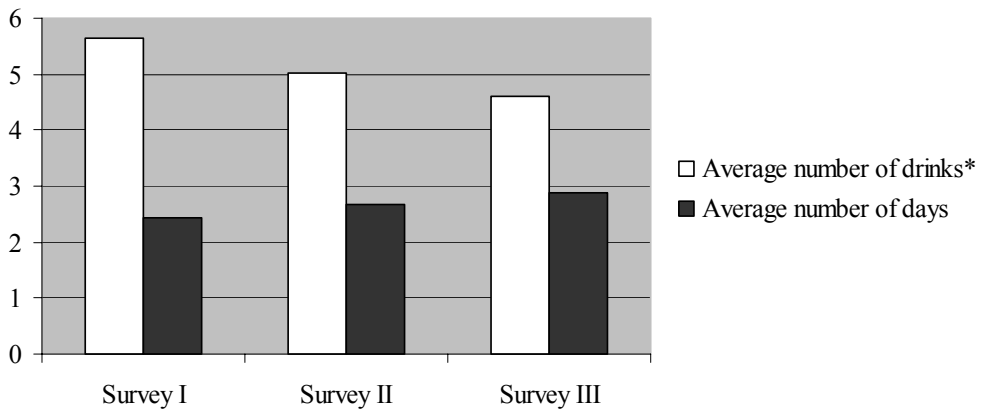
FIGURE 1. Perceived Quantity–Frequency Consumption
Without Negative Consequences

*p < .01.

2.63 (*SD* = 1.22), respectively, with smaller means indicating the participants thought they were more at risk for alcoholism. The results indicated a significant difference, $F(2, 150)$ = 20.81, $p < .001$, η_p^2 = .21. Post-hoc analyses using the Bonferroni method indicated significant differences between survey I and surveys II and III (mean difference = 0.71, $p < .001$; mean difference = 0.68, $p < .001$; respectively) but no significant difference between survey II and survey III.

Because of the high level of attrition, ANOVA procedures were also used to compare the quantity–frequency of the individuals completing certain portions of the evaluation. Individuals were grouped as completing survey I only, completing surveys I and II, and completing all three surveys. For the ANOVA procedures, normality was assumed for each of the variables. In addition, the Levene's test of homogeneity of variance was examined for significance. In one case this test was significant, and as a result Brown-Forsyth test statistic was used instead of the ANOVA. Any post-hoc analyses were conducted using the Bonferroni method. Significant differences were found for both the number of drinks, $F(2, 347.46)$ = 4.02, $p < .05$, η_p^2 = .02 (using Brown-Forsyth), and

the number of days, $F(2, 388)$ = 6.58, $p < .01$, η_p^2 = .03. The Bonferroni post-hoc analysis showed this difference to be significant between individuals who completed only survey I and those who completed all three surveys. Those completing only survey I consumed more drinks (30.26, SD = 34.93, versus 17.97, SD = 25.86; mean difference = 12.29, $p < .05$) and drank on more days (4.33, SD = 3.02, versus 2.82, SD = 2.56; mean difference = 1.51, $p = .001$) in the 2 weeks prior to the intervention than those who completed all three surveys. There were no significant differences in quantity–frequency of alcohol use when comparing those who completed survey I and II with those who completed only survey I or those who completed all three surveys.

Any differences in attitudes at the pretest between participants who completed specific portions of the study were also examined using the same procedures as the behavioral analyses described in the previous paragraph. There were no significant differences in perceived number of drinks on one occasion without negative consequences, $F(2, 394)$ = 0.68, $p > .50$, η_p^2 = .003, or risk for alcoholism between the groups, $F(2, 397)$ = 2.32, $p > .10$,

TABLE 3.
Negative Consequences Experienced in the Past Two Weeks

Consequences	Survey I (*n* = 78)		Survey II (*n* = 79)		Survey III (*n* = 79)	
	n	%	*n*	%	*n*	%
Memory Loss						
Never	50	63.3	53	67.1	58	73.4
Once	15	19.0	12	15.2	9	11.4
Twice	6	7.6	7	8.9	6	7.6
3-5 Times	3	3.8	4	5.1	4	5.1
6 or More times	4	5.1	3	3.8	2	2.5
Missed a Class						
Never	49	62.0	53	67.1	61	77.2
Once	16	20.3	12	15.2	10	12.7
Twice	6	7.6	7	8.9	3	3.8
3-5 Times	2	2.5	4	5.1	2	2.5
6 or More times	5	6.3	3	3.8	3	3.8
Experienced a Hangover						
Never	42	53.2	42	53.2	42	53.2
Once	11	13.9	19	24.1	18	22.8
Twice	12	15.2	9	11.4	12	15.2
3-5 Times	9	11.4	6	7.6	5	6.3
6 or More Times	4	5.1	3	3.8	2	2.5
Performed Poorly on Test or Project						
Never	66	83.5	67	84.8	72	91.1
Once	7	8.9	6	7.6	5	6.3
Twice	2	2.5	4	5.1	0	0.0
3-5 Times	3	3.8	2	2.5	1	1.3
6 or More Times	0	0.0	0	0.0	1	1.3
Argument or Fight						
Never	56	70.9	55	69.6	54	68.4
Once	11	13.9	16	20.3	19	24.1
Twice	5	6.3	2	2.5	4	5.1
3-5 Times	3	3.8	4	5.1	0	0.0
6 or More Times	3	3.8	2	2.5	2	2.5
Nauseated or Vomited						
Never	60	75.9	57	72.2	64	81.0
Once	9	11.4	12	15.2	10	12.7
Twice	3	3.8	5	6.3	1	1.3
3-5 Times	5	6.3	4	5.1	3	3.8
6 or More Times	1	1.3	1	1.3	1	1.3
Driven a Car Under the Influence						
Never	68	86.1	67	84.8	71	89.9
Once	3	3.8	5	6.3	4	5.1
Twice	2	2.5	2	2.5	3	3.8
3-5 Times	3	3.8	3	3.8	0	0.0
6 or More Times	2	2.5	2	2.5	1	1.3
Hurt, Injured, Had Unexplained Injury						
Never	61	77.2	67	84.8	71	89.9
Once	9	11.4	6	7.6	6	7.6
Twice	4	5.1	1	1.3	0	0.0
3-5 Times	3	3.8	4	5.1	2	2.5
6 or More Times	1	1.3	1	1.3	0	0.0

Note. No significant differences between surveys I, II and III.

$\eta_p^2 = .01$. There was a significant difference between individuals regarding the perceived number of days one could drink without negative consequence, $F(2, 355.57) = 3.59$, $p < .05$, $\eta_p^2 = .02$ (using Brown-Forsyth). The Bonferroni post-hoc analysis showed this difference to be significant between individuals who completed survey I only and those who completed all three surveys. Those completing only survey I perceived that alcohol could be consumed on 3.04 days ($SD = 1.81$) without negative consequences, whereas those completing all three surveys believed that alcohol could be consumed on 2.47 days ($SD = 1.23$) without negative consequences (mean difference = 0.57, $p < .05$).

DISCUSSION

This study indicates that the intervention had some immediate effects on drinking behavior. Both quantity and frequency measures reported significant differences between survey I and survey II. Likewise, perceptions about the quantity–frequency that one can drink without experiencing negative consequences were also changed by the intervention. The frequency of some negative consequences reported by the participants also decreased. Unfortunately, few of these changes were sustained at the 3-month follow-up survey.

Only the perceived number of drinks the participant can consume without experiencing negative consequences and the perceived risk of alcoholism maintained significant differences 3 months after the intervention. However, both of these changes may have a critical impact. Risk-taking behavior (engaging in behavior that has potential negative health consequences with no understanding or little concern of the risks [Irwin & Millstein, 1986]) has been well-documented among young adults (ACHA, 2007). College is often considered a time of life that allows individuals

to take risks and test limits in an effort to discover themselves (Arnett, 2000). Although this study's findings of change in risk perception is important, some studies have indicated that the perceived benefits of an outcome are more predictive of participation in risky behaviors than students' assessment of the perceived risks (Parsons, Siegel, & Cousins, 1997) and that students often see college as a time to engage in these risky behaviors before entering the "real world" (Dworkin, 2005). Others (Bachman, Johnston, & O'Malley, 1998) have found that individuals with increased perception of substance use risk do use less. These findings could also indicate a correction in perception; college students often overestimate the number of drinks it takes to incur a negative consequence and subsequently continue to consume the number of drinks that cause negative consequences (Mallett, Lee, Neighbors, Larimer, & Turrisi, 2006).

Utilizing Prochaska and DiClemente's (1984) transtheoretical model of change, the process of increasing perceptions of risk is a step that could lead to a change in behavior. The stages include precontemplation, contemplation, preparation, action, maintenance, and relapse. Through these stages, individuals move from a framework of not considering change to a mindset in which changes occur and are maintained. This study demonstrated a change in the perception of risk, which may be a consciousness-raising strategy that potentially could move individuals from precontemplation to contemplation. However, this suggestion is unable to be confirmed given that the evaluation did not actually measure the participants' stages.

Because the participants were completing the intervention as a sanction, it may not be all that surprising that the impact was minimal. Barnett and Read (2005) found limited evidence of efficacy within mandated interventions directed at college students. Those eval-

uations of sanctions demonstrating significant differences all used individual strategies, such as motivational interviewing (Barnett et al., 2004; Barnett & Read; Borsari & Carey, 2005; White et al., 2006); whereas *PFL:C* provides personalized feedback but does not include a motivational interviewing component.

Students need not only the trigger of an event (possibly the incident that caused the student to be referred to the university's judicial process) but also the incorporation of abstract conceptualization and reflective observations to fully integrate the experience. This intervention appears to begin that process. It seems that, initially, there is an impact on perceived number of drinks that can be consumed without negative consequences. These participants, then, were beginning that process of reflection and conceptualizing the information in terms of their own behavioral choices.

LIMITATIONS

Several limitations were present in this evaluation. The study design did not include a control group. As a result, the researchers could not control for the influence of environmental factors, like university policy changes and increased enforcement efforts. Another limitation was the high attrition rate. With 259 participants completing both survey I and survey II, the initial responses seemed promising. However, the low number of individuals completing all three surveys affected the generalizability of the results from survey III. Given the fact that alcohol use can negatively affect academic outcomes (Jennison, 2004), it is important to note that the high attrition from survey I to survey III could be the result of students dropping out. The highest risk users may have discontinued their participation in the study because they were no longer at the university. The researchers did

not track students' enrollment in the university during this time and have no data to determine how these students may have impacted the attrition rate. Future research with a similar sample may want to incorporate such a concern into the participant tracking method.

Another study design limitation was the length of time between survey II and survey III. The follow-up period for this design was only 3 months, and although limited changes were seen at this 3-month period, a longer follow-up period of 6 or 12 months would indicate if the changes in perception were sustained.

Students in the intervention were also at various points in their sanctioning/judicial processes. The length of time between the violation and intervention ranged from 9 to 695 days. Previous research has shown that students who were mandated to alcohol counseling following alcohol-related disciplinary violations reported having already made changes to their behavior by the time of the mandated intervention (Barnett et al., 2004; Fromme & Corbin, 2004). Although not a research question, the participants were asked to report the quantity–frequency of their alcohol consumption prior to the violation. Examining self-reported behaviors before the violation and immediately before the intervention indicated a significant decrease in the number of days alcohol was consumed, $t(374) = -4.46$, $p < .001$, but not the number of drinks consumed, $t(366) = 1.94$, $p > .05$. It is possible that the delay between the violation and actually attending *PFL:C* may have impacted the participants' behavior; however, there is not enough information to draw any definitive conclusions.

Although many of the survey items had been used extensively on this campus and nationally with high test–retest reliability, this study was the first use of this instrument as a whole. As a result, no a priori test–retest

reliability information was available for the instrument.

IMPLICATIONS FOR PRACTICE AND FUTURE RESEARCH

Developing effective interventions and sanctions for students who violate local or university policies is a critical component of an alcohol education program. Student affairs professionals need to carefully consider the desired outcome of the sanction. Most traditional efforts have not proven to be effective in terms of behavior change or decreasing negative consequences of alcohol use (Lance & Cronce, 2002; Walters & Bennett, 2000). If behavior change is the desired effect, then campuses need to utilize evidence-based practices. *PFL:C* shows short-term behavior change and changes in perception of risk at least 3 months after the intervention. This intervention could be considered an effective option if these changes are a desired effect. At this campus, discussions about objectives and desired outcome will determine if the program will continue to be mandated. In addition, other evidence-based options are being piloted with the intent to compare programs.

Additional research about interventions for sanctioned college students is needed. Subsequent studies of *PFL:C* should utilize a control group, as the use of control groups in alcohol and other drug evaluations on college campuses is very limited (Barnett & Read, 2005; Broughton & Molasso, 2006; Larimer & Cronce, 2002; Larimer, Kilmer & Lee, 2005; Moskowitz, 1989; Walters & Bennett, 2000). In addition, an evaluation that compares this intervention to other strategies that have demonstrated some effect (such as online strategies, i.e., Alcohol 101 [Larsen & Kozar, 2005; Reis & Riley, 2002] and myStudent.Body.com: Alcohol [Chiauzzi, Green, Lord, Thum, & Goldstein, 2005] as well as motivational interviewing techniques) would provide a more complete picture of effect. In addition to the efficacy of a program, colleges and universities should also consider the cost-effectiveness of interventions if they are to be implemented and maintained. Universities need to provide services and education for those who have violated a university policy or local law; however, as many of these efforts are not effective, the resources used for this population should be balanced with the need for resources directed toward prevention programming.

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