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Perceptions of Alcohol Policy and Drinking Behavior: Results of a Latent Class Analysis of College Student Drinkers

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Abstract

Objective—The purpose of this study was to extend the limited research on college student support for alcohol control policies by using a latent class analysis to examine the shared characteristics of drinking students who support or oppose such policies.

Methods—We used data from a sample of 2393 students drawn from a larger study on high risk drinking at a mid-western university. Data was collected between October 2005 and May 2007. We conducted a latent class analysis to identify sub-groups of drinking students based on relevant variables.

Results—The results of the latent class analysis yielded a model which could correctly classify 90% of the students taking the survey into one of four “classes” based upon their response to four items on the questionnaire.

Conclusions—Interventions would benefit from approaches that target both student perceptions and specific policies that are most conducive to student support and engagement.

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Contributors

Authors Buettner and Andrews designed the study and wrote the protocol. Author Bartle-Haring conducted the statistical analysis. Author Khurana conducted literature searches. Author Buettner wrote the first draft of the manuscript and the revised submission and all authors contributed to and have approved the final manuscript.

Statement 3: Conflict of Interest

All authors declare that they have no conflicts of interest.

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Keywords

Alcohol policy; drinking behaviors; college students

1. Introduction

Alcohol misuse among young adults continues to be a concern on college campuses where the high personal and institutional costs associated with it are well documented (Hingson, Heeren, Winter & Wechsler, 2005; Perkins, 2002). Although interventions have been numerous over the last few decades, the overall prevalence rates of high-risk drinking remain high (Wechsler et al., 2002).

Some intervention efforts have focused on altering social norms (Toomey, Lenk & Wagenaar, 2007). The evidence of effectiveness is strongest for norms corrections using individually focused brief motivational interventions (Carey, Carey, Maisto & Henson, 2006; Larimer & Cronce, 2002). Unfortunately, research on the effectiveness of social norms marketing campaigns, which have the potential of reaching a larger number of students at greater cost effectiveness, has been inconclusive (Clapp, Lange, Russel, Shillington & Voas, 2003; DeJong et al., 2006; Werch, Pappas, Carlson, DiClemente, Chally & Sinder, 2000).

Use of access restriction and alcohol affordability strategies in college populations has been encouraged (NIAAA, 2002), given research that supports effectiveness of these strategies in non-college populations (Toomey & Wagenaar, 2002). However, their use in college settings has been limited due to the real ("Student rioters" 1998) and perceived student opposition to stricter control policies and enforcement.

A few studies have shown student support for some alcohol control policies (DeJong, Towvim & Schneider, 2007; Wechsler, Lee, Nelson & Kuo, 2002). However, the relationship between students' perceptions of college policies – norms at a more macro level – and their own alcohol use is largely unexplored. Lavigne, Witt, Wood, Laforge & DeJong (2008) examined predictors of alcohol control policy support among students at a public university and found less support among men, heavier drinkers, and frequent drinking drivers.

This study aimed to extend the limited research on student support for alcohol control policies and to compare the characteristics of drinking students who support or do not support such policies. We used latent class analysis to identify sub-groups of drinking students in the belief that better understanding of the differences and commonalities of supporters and non supporters can help in tailoring communication strategies for existing policies and inform development of new interventions.

2. Methods

2.1. Sample

Present sample (N = 2393) was drawn from a larger study of drinking behavior at a large mid-western university and included students responding to an online survey conducted in eight waves over two years. Waves corresponded with two weekends each in fall and spring quarters targeted because of their risk potential (high or low) for excessive drinking and riotous behavior. Details about risk status determination, survey construction and procedure were reported earlier (DuRant et al., 2008). All study procedures were approved by the university's IRB.

The sample consisted of 50.4% female and 49.6% male students. Twenty-three percent were freshman, 26.2% were sophomores, 25.3% were juniors, and 25.5% were seniors.

2.2 Measures

Besides demographics, the questionnaire included items about alcohol use, perceptions of alcohol policies and control/enforcement efforts, ease of obtaining alcohol when underage, negative consequences due to one's own drinking, and negative consequences due to other's drinking.

2.3. Data Analysis

Since little is understood about the distribution of student drinkers, we used an exploratory approach to conducting Latent Class Analysis (LCA) to identify discrete groups within the sample based on relevant characteristics. Several models were compared from the most number of classes possible to the least number, using the Bayesian Information Criterion (BIC) and entropy, or the proportion of cases that can be correctly classified. Once the model with the best fit was identified, classes were interpreted based on their distinguishing characteristics. All models in the present analyses were estimated using Mplus (Muthen & Muthen, 2006).

3. Results

Table 1 reports descriptive statistics. For LCA, students' perceptions of the environment on campus in terms of alcohol policies and availability were used to classify. If these variables were capable of distinguishing between classes, and the classes were also related to problem drinking and its consequences, then prevention efforts could be directed at the perceptions of actual alcohol control policies on campus. Age of onset has been identified as a risk factor for problem drinking (Hingson, Heeren & Winter, 2006), and was therefore also included. Thus, the variables entered for the LCA were age at first drink, perceptions of alcohol policies as either too strict or too lenient with the reference category being just right, perceptions of how likely underage drinkers would be caught, whether the respondent was underage, and perceptions about how easy it was for underage drinkers to obtain alcohol.

Comparisons across various models revealed that the 4 class model offered the best fit to the data, with the lowest BIC score (21214.23) and the best entropy score (.90). Table 2 provides the description of these classes and size and latent class probabilities for the most likely latent class membership. The distinguishing feature of two of the classes was related to perceptions of policy. For the first class, labeled JRP (Just Right Policy), the most distinguishing characteristic was these students tended to believe that the alcohol policies were just right. This group had an average age of onset of alcohol use. The distinguishing feature of the second class, labeled TSP (Too Strict Policy), was that the group believed that the alcohol policies were too strict. This group also had an average age of onset of alcohol use. The third group's most distinguishing feature was a later than average age of onset. This group was labeled LO for late onset. We labeled the final group, EO, as its most distinguishing feature was an earlier than average age of onset.

The overall MANOVA revealed significant differences in the mean scores of different classes on the risk variables (Wilks' Lambda = 0.95; $F(15, 4182.64) = 4.98$; $p < .001$). Results of the univariate tests showed significant differences among the classes on experiencing negative consequences due to other's drinking ($F(3) = 9.30$; $p < .001$), experiencing negative consequences due to one's own drinking ($F(3) = 14.64$; $p < .001$), number of negative consequences around risky sexual behavior ($F(3) = 3.83$; $p < .001$), and number of drunk days ($F(3) = 17.81$; $p < .001$). The means and standard deviations for each group for each of the outcome variables are presented in Table 2.

Posthoc bonferroni analyses revealed that the late onset (LO) group had experienced the fewest number of negative consequences due to others' drinking as compared to the too strict policy (TSP) and early onset (EO) groups. The TSP group experienced significantly more negative consequences due to others' drinking than the just right policy (JRP) group. On average, the TSP group reported significantly higher number of negative consequences associated with one's own drinking as well as more drunk days in comparison to the LO and JRP groups. This group also reported significantly greater negative sexual experiences associated with drinking, compared to the JRP group.

Chi-square analyses revealed unequal distributions for gender ($\chi^2(3) = 74.69; p < .001$); males were more likely to be in the TSP group, females were more likely to be in the JRP group. Further, those students who participated in Greek life ($\chi^2(3) = 30.26; p < .001$) and intramural sports ($\chi^2(3) = 36.76; p < .001$) had significantly higher likelihood of being in the TSP group compared to their peers who did not. In contrast, participation in a religious group was associated with a lower likelihood of being in the TSP group ($\chi^2(3) = 15.02; p < .001$).

4. Comment

The present sample included an ample number of high risk drinkers with the average student consuming 8–10 drinks on the targeted weekend nights. Despite the high reported drinking level, the relatively high number of underage drinkers in the sample, and the substantial number of negative consequences suffered by drinkers, the majority of students (62.5%) reported the university alcohol policies were “about right”. This percentage parallels findings by DeJong et al. (2007) in which the majority of students at most schools indicated support for at least some university alcohol policies. One might expect more overall resistance to policies given the magnitude of drinking and negative consequences experienced by the sample and recent findings indicating that heavy drinkers are least likely to support alcohol control strategies (Lavigne et al., 2008).

The results of the latent class analysis yielded a model which could correctly classify 90% of the students taking the survey into one of four “classes” based upon their response to items. Age of first drink distinguished two classes from the others with one class predominantly defined by students who had their first drink very early (average age under 11) and another class predominantly defined by students who did not have their first drink until much later (average age over 19). These classifications, combined, account for only 151 (6%) of the responding students. The remaining two classes included students with very similar ages of onset of drinking, but very different perceptions about the strictness of university rules governing alcohol consumption. The largest class (74% of responders) had an average age of drinking onset and perceived the university policies to be “about right.” The most interesting classification were those students (20% of the sample) with an average age of onset and a very uniform perception that the university policies related to alcohol were too strict (100% of class members held this view).

MANOVA results and subsequent post hoc analyses revealed that the average age of onset students who view university policies as “too strict” are most comparable to early starting students in their high rates of problem drinking and negative consequences experienced. These students, however, differ significantly from students with similar age of onset, but who think the strictness of alcohol policies are “about right.” On most measures, all three of these classifications differ from the late starting drinkers who can be considered the lowest risk. Interestingly, underage drinkers were uniformly distributed across three of the four classes with the exception being late onset drinkers.

The notion that drinkers who have similar starting patterns can be differentiated based upon their attitudes toward alcohol policies combined with the observance that these attitudes are associated with different levels of high risk drinking behavior has important implications for university intervention efforts. More targeted interventions can be developed when specific audiences who might benefit are better defined.

Data from this study, and others, suggest that universal prevention efforts designed to persuade students to understand and support efforts to reduce high risk drinking may be too broadly distributed and inefficient in that the majority of students express verbal support of the policies, and those who are supportive of these policies are generally not at risk. With finite and limited resources, institutions should be using more economically efficient and potentially more effective targeted approaches geared towards changing the perception and behavior of those students who think that the policies are too strict.

Buettner, Andrews and Glassman (2009) demonstrate that it is possible to engage higher risk students in alcohol abuse prevention and intervention activities. Furthermore, DeJong et al. (2007) found that certain policies are highly accepted by the majority of students across multiple schools (i.e. policies focusing on preventing drinking related violent/aggressive behavior).

In addition to using social norms marketing to correct misperceptions of drinking norms, publicizing the majority support for alcohol control policies on campus may impact the attitudes of students who perceive university policies to be too strict. Using mass media campaigns to promote positive attitudes towards university policies might make it easier for university officials to implement stricter penalties for alcohol related violations without provoking strong resistance from students.

Several limitations should be considered when interpreting these findings. Because the data collected are cross-sectional, no cause-and-effect relationships can be made. Further, the sample was confined to a Midwestern university, so findings are limited in terms of generalizability.

Future research should focus on additional student perception variables that may be related to support for, or adherence to university alcohol policies. The cause-and-effect relationship between student perceptions of alcohol policies and the drinking behavior of students should also be explored.

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Table 1

Descriptive Statistics

Variable Name	Mean (SD)/Frequency
Age (Range: 8–26)	20.0 (2.18)
Gender	
Male	49.6%
Female	50.4%
Race/Ethnicity	
Caucasian	87.0%
African American	3.4%
Asian or Pacific Islander	4.8%
Undergraduate Status	
Freshman	23.0%
Sophomore	26.2%
Junior	25.3%
Senior	25.5%
Mother's Level of Education	
Has college or graduate degree	78.0%
Below college	22.0%
Father's Level of Education	
Has college or graduate degree	81.6%
Below college	18.4%
Participation in...	
Fraternities/Sororities	13.0%
Athletic groups	2.0%
Intramural sports	30.0%
Religious organizations	8.0%
Workforce	57.0%
Age at first drink	16.2 (1.18)
Underage at survey	
Yes	59.0%
No	41.0%
Perceptions of alcohol policies on campus	
Too strict	20.5%
Just right	61.6%
Too lenient	17.9%
Perceptions of ease of obtaining alcohol if underage	
Easy	96.0%
Difficult	4.0%
Perceptions that an underage drinker would get caught	
Likely	17.0%
Not likely	83.0%
In the past 3 days, number of days drunk	1.36

Variable Name	Mean (SD)/Frequency
Total number of drinks taken on last...	
Thursday	10.50
Friday	8.50
Saturday	8.60
Negative consequences associated with...	
One's own drinking	4.50
Other's drinking	3.19
Risky sexual behaviors due to drinking	0.27
Aggressive behaviors due to drinking	4.60

Table 2

Descriptive Statistics and MANOVA results for the Four Class LCA

Variable	Latent Class			
	JRP	TSP	LO	EO
Number of cases (N)	1764	478	100	51
Latent Class Probability	0.95	0.98	0.74	0.83
Mean age at first drink	16.19	16.12	19.36	10.38
Probability that...				
Respondent was underage	0.64	0.58	0.00	0.53
Respondent perceived alcohol policies as being too strict	0.00	1.0	0.03	0.18
Respondent perceived alcohol policies as being too lenient	0.21	0	0.34	0.24
Respondent perceived that an underage drinker would get caught	0.15	0.20	0.22	0.23
Respondent perceived that it was easy for an underage drinker to get alcohol	0.96	0.94	0.98	1.0
Latent Class Comparisons: Means (SD)				
Consequences due to others' drinking	3.27 (2.40)	3.95 (2.78)	2.42 (2.72)	4.13 (2.48)
Consequences due to own drinking	4.50 (3.24)	5.74 (3.34)	3.40 (3.43)	5.10 (3.59)
Risky Sexual behavior consequences	0.25 (0.56)	0.37 (0.75)	0.16 (0.37)	0.34 (0.76)
Aggressive Behavior	0.46 (0.67)	0.52 (0.72)	0.31 (0.47)	0.40 (0.61)
Number of drunk days in the past 3	1.26 (1.02)	1.71 (1.04)	1.00 (0.94)	1.20 (1.08)