Profiles of College Students Mandated to Alcohol Intervention*

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ABSTRACT. Objective: Most colleges have sanctions or required interventions for students who receive alcohol violations or medical evaluation for intoxication. The aim of this study was to establish profiles of mandated students from a combined data set using exploratory and replication cluster analysis. **Method:** Data sets from three samples of mandated students (total participant $n = 393$) were combined for exploratory analyses, and a fourth sample ($n = 289$) was analyzed for replication. Clustering variables were past-month heavy drinking, past-year alcohol problems, incident alcohol use, responsibility for the incident, and aversiveness of the incident. **Results:** A three-cluster solution was produced in the exploratory analysis and confirmed in replication

and cross-replication analyses. Clusters formed included a "Why Me?" cluster characterized by a pattern of relatively low heavy drinking and alcohol-related problems, very little incident drinking, and low responsibility and aversiveness. A "So What?" cluster was characterized by high heavy drinking and alcohol-related problems, moderate incident drinking and responsibility, and low aversiveness. A "Bad Incident" cluster was characterized by low scores for heavy drinking and problems and high levels of incident drinking, responsibility, and aversiveness. External variables supported the validity of the cluster solution. **Conclusions:** Mandated students form clinically meaningful profiles on easily measured constructs. (*J. Stud. Alcohol Drugs* 69: 684-694, 2008)

YOUNG ADULTS SHOW HIGHER RATES of drinking and heavy drinking than all other age groups (Naimi et al., 2003), and college students report higher rates of monthly drinking (68%) and past 2-week heavy drinking (40%) than young adults who do not attend college (59% and 35%, respectively; Johnston et al., 2006). Although the proportion of college students who show a pattern of daily heavy drinking characteristic of alcohol dependence is small (approximately 5%), individual campuses report hundreds of cases of alcohol violations and extreme intoxication per year (Porter, 2006), and alcohol use is a major contributor to college student morbidity and mortality (Hingson et al., 2005).

Most colleges and universities have systems that identify students who violate policies regarding alcohol (Anderson and Gadaletto, 2001) or who have a medical incident related to alcohol (Higher Education Center for Alcohol and Other Drug Prevention, 1996; Lewis and Marchell, 2006). Inci-

dents range in severity from being (underage) in the presence of alcohol to being transported to the emergency department for alcohol intoxication (Barnett et al., 2004; Borsari and Tevyaw, 2005). Mandated students (i.e., those who receive mandatory intervention) appear to have more problematic patterns of alcohol use than comparison groups of students (Caldwell, 2002; Fromme and Corbin, 2004; LaBrie et al., 2006b), and their drinking is quite heterogeneous, as reflected in high reported variance in alcohol use (Tevyaw et al., 2007; White et al., 2007).

The reported increase in the number of alcohol violations nationwide (Porter, 2006), the heterogeneity of drinking experience and type of offenses in adjudicated students, the development of policies to address intoxicated students (Colby et al., 2000; Lewis and Marchell, 2006), and the growing body of literature on the efficacy of interventions with this population (Barnett and Read, 2005; Larimer and Crounce, 2007) reflect the need to establish functional systems for screening, triaging, and intervening with those students most in need of services. Establishing whether there are distinct subtypes of mandated students that vary systematically in terms of clinically relevant indices would provide important information for the development of such systems. However, to date there is no research examining whether mandated students can be classified into distinct clinically relevant subtypes.

To a large extent, individual campus alcohol policies determine the characteristics of the mandated student population. For example, a campus that is "dry" (i.e., prohibits all alcohol) will have a higher proportion of violations for

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alcohol possession than a “wet” campus, which permits alcohol possession by students of legal drinking age. Campuses with well-publicized “medical amnesty” policies (i.e., those that eliminate or reduce sanctions for students involved in alcohol-related medical emergencies; Lewis and Marchell, 2006) may have a higher proportion of intoxication cases. Furthermore, policy enforcement differs across campuses, such that students who receive discipline or sanctions may be a very select group on some campuses (e.g., only those who are arrested or transported to the emergency department for intoxication). These elements that differ across campuses limit the generalizability of findings on one campus to campuses that have similar policies and enforcement practices. In the only study of mandated students that sampled across two campuses (Borsari and Carey, 2005), mandated students from one campus had more extreme patterns of alcohol use than the other (Borsari, 2003). In sum, there may be important policy-driven campus differences in drinking profiles among alcohol violators, but research with larger samples is needed.

There are key constructs that are clinically relevant for a mandated student population. Prior experience with alcohol and alcohol problems are of primary importance; individuals who have less experience with alcohol and few prior consequences may have a different response to a single incident and may require different intervention approaches than individuals who have more experience with alcohol (Barnett et al., 2002; Morgan et al., 2005).

The amount of alcohol use in the incident itself has obvious clinical relevance, but this element of an incident may be interpreted differently in the context of other experiences. For example, an individual who had extensive prior experience with alcohol and a heavy drinking incident that led to an infraction might be considered a problem drinker in need of different services than an individual who had a heavy drinking incident in the context of very little prior experience.

Cognitive and affective reactions to specific alcohol-related incidents also may be particularly important for planning interventions. For example, Barnett et al. (2006) established that the aversiveness of an alcohol-related incident was related to greater readiness to change drinking. In other words, someone who is distressed about an alcohol-related incident may have a different presentation than one who is not bothered by the incident. Feeling responsible for the incident may be important as well (Longabaugh et al., 1995). It is possible, for example, that an individual who feels more responsible for an incident will respond appropriately and require no further intervention or may be more responsive to intervention than someone who does not feel responsible. In sum, prior alcohol-related experience, alcohol use in the incident, and reaction to the recent alcohol incident are important for understanding the presentations of mandated college students and for planning clinical responses.

In this study we examined whether distinct subtypes of mandated students could be reliably identified based on the clustering of five empirically and clinically relevant variables. We employed cluster analysis, which allowed us to go beyond the importance of any one variable (or relationship among a few variables) to evaluate unique combinations. Data from independent clinical investigations of mandated undergraduates at three colleges were combined to form a data set for an exploratory cluster analysis, followed by a replication cluster analysis with a sample from a fourth campus. Cross-replication cluster analysis with the combined (four-campus) data set and discriminant function analysis were conducted for additional confirmation of the cluster solution. Validity was further evaluated by comparing the clusters on external variables, including type of initial incident/violation.

Method

Study samples and design

This project evaluated baseline data collected in independent randomized trials conducted on four different 4-year private colleges in New England (see Table 1 for summary of demographic variables). Participants were 18 years of age or older and had been referred for alcohol education or counseling following an alcohol-related offense or other alcohol-related incident. Data extracted for use in the present study were collected by interviewer-administered and self-report assessments before the research intervention. All procedures were approved by the associated institutional review board.

Project 1. This project was a randomized, controlled trial comparing brief motivational intervention (BMI) with computerized alcohol education and 1-month booster to no booster (Barnett et al., 2007). Mandated students participated as an alternative to having an individual counseling session with a university health educator. Seniors were excluded because they would graduate during the trial. There were no gender or class-year differences between participants ($n = 225$) and refusers. The median time between incident and assessment was 27 days.

Project 2. This study was a randomized, controlled trial of an individual BMI compared with a peer-enhanced BMI (Tevyaw et al., 2007). Students who had received an alcohol-related infraction completed a mandatory 60-minute group alcohol education class and were then invited to participate in the study. Those who agreed and completed baseline assessment and intervention sessions ($n = 38$) had their \$50 fine waived by the university.

Project 3. This study was a randomized, controlled trial of an individual BMI compared with a peer-enhanced BMI ($n = 130$; Tevyaw et al., 2005). Following an infraction of campus alcohol policy, students completed a mandatory

TABLE 1. Descriptive data for each project

Project characteristics	Project 1 (<i>n</i> = 225)	Project 2 (<i>n</i> = 38)	Project 3 (<i>n</i> = 130)	Project 4 (<i>n</i> = 289)	
Campus enrollment, <i>n</i>	5,900	10,000	2,700	3,800	
Data collection period	2000-2004	2000-2001	2002-2004	2005-2006	
Project enrollment rate, %	65	na	90	66	
Sample description	<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)	Total <i>n</i> (%)
Male	110 (48.9)	25 (65.8)	60 (46.2)	188 (65.1)	383 (56.2)
Ethnicity ^a					
White	170 (75.6)	31 (81.6)	124 (95.4)	285 (98.6)	610 (89.4)
Asian	34 (15.1)	1 (2.6)	2 (1.5)	1 (0.3)	38 (5.6)
Hispanic	29 (12.9)	3 (7.9)	4 (3.1)	0 (0.0)	36 (5.3)
Black	8 (3.6)	1 (2.6)	0 (0.0)	5 (1.7)	14 (2.1)
Native American	5 (2.2)	1 (2.6)	0 (0.0)	2 (0.7)	8 (1.2)
Other	6 (2.7)	1 (2.6)	4 (3.1)	4 (1.3)	15 (2.2)
Year in school					
Freshman	150 (66.7)	30 (78.9)	47 (36.2)	198 (68.5)	425 (62.3)
Sophomore	45 (20.0)	5 (13.2)	75 (57.7)	58 (20.1)	183 (26.8)
Junior	30 (13.3)	0 (0.0)	8 (6.2)	21 (7.3)	59 (8.7)
Senior	0 (0.0)	3 (7.9)	0 (0.0)	12 (4.2)	15 (2.2)
Violation type					
Presence	0 (0.0)	16 (42.1)	37 (28.5)	17 (5.9)	70 (10.3)
Possession	16 (7.1)	18 (47.4)	92 (70.8)	239 (82.7)	365 (53.5)
Behavior	20 (8.9)	3 (7.9)	1 (0.8)	21 (7.3)	45 (6.6)
Medical issue	189 (84.0)	1 (2.6)	0 (0.0)	12 (4.2)	202 (29.6)

Notes: na = not available. ^aProportions do not equal 100% in Projects 1, 3, and 4 because 39 participants (5.7%) reported more than one category.

group alcohol education class, after which they were invited to participate in the study.

Project 4. This project was a test of a stepped-care approach, in which first-time alcohol offenders who had not reduced drinking in the 6 weeks following a brief (15-minute) advice session were randomly assigned to BMI or no further intervention (*n* = 289; Borsari et al., 2007). The baseline assessment was conducted before the advice session, and the median time between incident and assessment was 19 days.

Measures

Cluster variables. Five variables were used to determine the profiles of mandated students. The number of heavy drinking days in the past month was obtained using the Timeline Followback interview (Sobell and Sobell, 1992, 1996). Drinks were defined as one 12 oz beer or wine cooler, 4 oz of wine, or 1.25 oz of distilled spirits. Heavy drinking was defined as five or more drinks for men and four or more drinks for women (National Institute on Alcohol Abuse and Alcoholism, 2004). The assessment period was 30 days before the assessment date. Participants also retrospectively estimated the total number of drinks they consumed on the date of the referral incident.

In the three projects that comprised the exploratory sample (Projects 1-3), past-year alcohol-related problems were measured by the Young Adult Alcohol Problems Screening Test (Hurlbut and Sher, 1992), comprising 27 items dichotomized and summed for a total score ($\alpha = .77$ in this sample). In the replication sample, alcohol problems were measured

using the Young Adult Alcohol Consequences Questionnaire (Kahler et al., 2005); 48 dichotomous items were summed to create a total score ($\alpha = .89$).

Responsibility and aversiveness scales were adapted from a measure that assesses reactions to alcohol-related injuries in emergency department patients (Longabaugh et al., 1995). Principal components analysis with mandated students (Barnett et al., 2006) revealed two scales: responsibility for the incident (three items: "To what extent do you believe your alcohol consumption was responsible for this incident?," "To what extent was the incident your own fault?," and "To what extent do you believe your own risk-taking behavior was responsible for this incident?") and aversiveness of the incident (three items: "To what extent has this incident upset you?," "When thinking about this incident, how badly do you feel about it?," and "How unpleasant has this incident been for you?"). All items were scored on a 7-point scale from 1 (not at all) to 7 (extremely or totally). Summed scale scores ($\alpha = .77$ to .85) were used for cluster analyses.

External variables. We examined eight external variables to evaluate cluster validity, including age, gender, and school year. To investigate cluster differences on other measures of alcohol use, we analyzed additional alcohol-use variables of quantity (past-month drinks per drinking day) and frequency (number of drinking days in the past month), which were derived from the Timeline Followback interview. Cigarette use and marijuana use are both commonly associated with drinking in college students (Gledhill-Hoyt et al., 2000); therefore, number of days of cigarette use and number of days of marijuana use in the past month were examined.

TABLE 2. Values for clustering variables for each sample

Variable	Exploratory sample			Replication sample	Statistic
	Project 1 (<i>n</i> = 225) Mean (SD)	Project 2 (<i>n</i> = 38) Mean (SD)	Project 3 (<i>n</i> = 130) Mean (SD)	Project 4 (<i>n</i> = 289) Mean (SD)	
No. of heavy drinking days, past month	2.91 ^a (3.12)	7.16 ^{b,c} (5.39)	5.08 ^b (3.86)	7.98 ^c (5.01)	$F = 61.27, \dagger 3/676$ df
Alcohol problems, past year	5.69 ^a (2.96)	8.11 ^b (3.86)	7.65 ^b (3.94)	12.44 (8.16)	$F = 17.99, \dagger 2/390$ df
Standard drinks in incident	8.93 ^a (5.47)	3.49 ^b (4.86)	4.01 ^b (4.23)	7.09 ^c (5.18)	$F = 31.59, \dagger 3/677$ df
Responsibility	16.86 ^a (4.21)	13.76 ^b (4.42)	10.06 ^c (5.12)	11.81 ^b (5.17)	$F = 69.23, \dagger 3/675$ df
Aversiveness	12.30 ^a (4.62)	9.41 ^{b,c} (4.94)	10.89 ^{a,b} (4.25)	9.40 ^c (4.64)	$F = 17.94, \dagger 3/676$ df

Notes: Alcohol problems were measured using the Young Adult Alcohol Problems Screening Test (scores range from 0 to 27) for the exploratory sample and the Young Adult Alcohol Consequences Questionnaire (range 0–42) in the replication sample. Original values are presented for descriptive purposes; inferential statistics were conducted using the original values. Scheffé pairwise comparisons were conducted between all projects, except for alcohol problems because of a measurement difference for this variable between the exploratory and replication samples (the omnibus statistic for alcohol problems is for the exploratory sample only). Different superscripts in each row indicate group means differed significantly at $p < .05$.

[†] $p < .001$.

The final external variable was incident type, derived from review of incident records and coded by research staff from the source project. Incident type was classified as the following: being in the presence of alcohol, alcohol possession, alcohol-related behavior, or medical evaluation.

Analysis plan

Cluster analysis is an exploratory analytic method used to identify natural groupings of observations according to their relative similarity or distance from each other on a given set of measures (Johnson and Wichern, 1998). We used cluster analysis to classify mandated students from the four projects on the basis of the five standardized variables ([1] number of heavy drinking days in the past month, [2] number of alcohol-related problems in past year, [3] number of drinks consumed at the time of the incident, [4] perceived responsibility, and [5] aversiveness of the referral incident). Cluster analysis is susceptible to the characteristics of the data used to create clusters (Aldenderfer and Blashfield, 1984; Tan et al., 2005), so replicating the results of a cluster solution in an independent sample is an indication that the clusters represent externally valid groups (Breckenridge, 1989). Therefore, we partitioned our samples into two data sets—an exploratory data set comprising data from Projects 1, 2, and 3 and a replication data set using Project 4. This analysis

plan reflected a balance of maximizing our statistical power while preserving a similar-size independent sample with which to replicate our findings, the gold standard of cluster analysis.

As a first step, we examined the correlations among the five clustering variables for both the exploratory and replication data sets. Next, we conducted cluster analyses with the exploratory data set using the k means procedure in SPSS 14.0 for Windows (SPSS Inc., Chicago IL). As a third step, we conducted a cluster analysis on the replication data set to improve our confidence in the external validity and clinical relevance of our cluster solution (e.g., Minugh and Harlow, 1994). To further increase our confidence in the reliability of the clusters, we conducted a cross-replication of the cluster solution (e.g., Rapkin and Luke, 1993), which required combining the entire (four-project) sample, dividing it in half, and conducting a cluster analysis of the combined sample. We also conducted a discriminant function analysis (using the same five variables) to assign cluster membership to cases in both halves of the sample. These assignments were then compared with the results of the original k means cluster assignments.

High levels of agreement between the two approaches are a strong indication of the reliability of the cluster solution. Because replication and cross-replication of clusters do not solely establish validity (Aldenderfer and Blashfield, 1984),

TABLE 3. Intercorrelations among five clustering variables for the exploratory sample ($n = 393$) and the replication sample ($n = 289$)

Cluster variable	1	2	3	4	5
1. Heavy drinking days	—	.51 [†]	.33 [†]	.22 [†]	-.14*
2. Alcohol problems	.61 [†]	—	.35 [†]	.29 [†]	.02
3. Standard drinks in incident	.03	.09	—	.36 [†]	.01
4. Responsibility	-.14 [†]	-.12*	.40 [†]	—	.10
5. Aversiveness	-.26 [†]	-.11*	.15 [†]	.18 [†]	—

Notes: Correlations for the z scores from the exploratory cluster solution are reported below the diagonal and correlations for the z scores from the replication sample are reported above the diagonal.

* $p < .05$; [†] $p < .01$.

a final step was to examine differences among the clusters on external variables that are theoretically meaningful to the cluster solution and would be expected to differentiate the clusters (Aldenderfer and Blashfield, 1984; Dillon and Goldstein, 1984; Dubes and Jain, 1979).

Results

Preliminary analyses

No clustering or external variables were significantly skewed or kurtotic, and there were no outliers greater than 3 SDs from the sample mean. Values for the individual variables by project are presented in Table 2. One-way analyses of variance (ANOVAs) indicated significant between-project differences for all variables. The clustering variables were moderately correlated (Table 3) but not correlated highly enough to warrant their exclusion (Lorr, 1983). Data from Projects 1, 2, and 3 were merged to create the exploratory data set. All variables were converted to *z* scores in this exploratory data set before cluster analysis; variables in the replication data set were *z* scored separately.

Exploratory cluster analysis

Using the combined sample, we examined cluster solutions using the *k* means procedure, in which the number of clusters (*k*) is set a priori. Because the number of clusters is predetermined, it is recommended that several cluster solutions are calculated and compared. Determining how many clusters to use is an inexact science (Aldenderfer and Blashfield, 1984; Tan et al., 2005); therefore, we examined two-, three-, four-, five-, and six-cluster solutions. The purpose of using cluster analysis was not to "test" how many unique clusters were in these data; rather, we wanted to capture as much variability as possible in profiles of mandated students while also providing sufficiently large cell sizes for meaningful statistical comparisons. The two-cluster solution was not very informative, and the four-, five-, and six-cluster solu-

tions were not easily interpreted (individual clusters were highly similar). The three-cluster solution had a meaningful number of cases in each cluster, had significant differences on factor variables between clusters, and was easily interpreted (Rapkin and Luke, 1993). Table 4 presents the cluster means for the five variables used to define the original cluster solutions. Multivariate analysis of variance (MANOVA) revealed significant between-cluster differences across the five factor variables, as indicated by the Pillai-Bartlett multivariate test statistic ($V = 1.32$; $F = 146.90$, 10/762 df, $p < .001$). Univariate ANOVAs revealed significant cluster differences on each factor variable.

The most meaningful way to interpret the clusters is to evaluate where each cluster scored on each clustering variable relative to the other clusters. Students assigned to the first cluster (Cluster 1) reported a pattern of relatively few heavy drinking days and alcohol-related problems and low scores on responsibility for the incident and on the aversiveness indicator. Number of drinks consumed before the referral incident was also lowest relative to the other clusters. This group constitutes light-drinking students who did not drink much before the incident, did not feel the alcohol-related incident was their fault, and did not find the incident particularly aversive. Therefore, we assigned this group the label "Why Me?"

The second cluster of students (Cluster 2) had a pattern of heavy drinking and alcohol-related problems with a level of drinking in the incident that was between the other two groups. These students assumed some responsibility for the incident, showing scores in between the two other clusters on this variable. However, their aversiveness scores were low. This cluster reflects a heavy drinking student who has an alcohol incident on a day of relatively average drinking and acknowledges responsibility but does not report a negative affective reaction. We labeled this cluster "So What?"

In contrast, the third cluster (Cluster 3) was composed of individuals who had the lowest scores for prior heavy drinking and problems but the highest number of drinks at the time of the incident and the highest levels of responsibility

TABLE 4. Cluster *z* score means for exploratory and replication clusters

Cluster variable	Exploratory sample (<i>n</i> = 393)				Replication sample (<i>n</i> = 289)			
	"Why Me?" (<i>n</i> = 115; 29.3%)	"So What?" (<i>n</i> = 97; 24.7%)	"Bad Incident" (<i>n</i> = 181; 46.1%)	<i>F</i> (2/390 df)	"Why Me?" (<i>n</i> = 150; 51.9%)	"So What?" (<i>n</i> = 85; 29.4%)	"Bad Incident" (<i>n</i> = 54; 18.7%)	<i>F</i> (2/286 df)
Heavy drinking days	-0.27 ^a	1.33 ^b	-0.55 ^c	287.97*	-0.47 ^a	0.85 ^b	-0.02 ^c	70.49*
Alcohol problems	-0.26 ^a	1.13 ^b	-0.44 ^a	144.41*	-0.53 ^a	0.67 ^b	0.42 ^b	66.06*
Standard drinks in incident	-0.82 ^a	0.14 ^b	0.44 ^c	80.12*	-0.55 ^a	0.42 ^b	0.88 ^c	79.25*
Responsibility	-1.08 ^a	-0.09 ^b	0.74 ^c	291.45*	-0.57 ^a	0.56 ^b	0.70 ^b	77.84*
Aversiveness	-0.27 ^a	-0.40 ^a	0.38 ^b	28.92*	-0.10 ^a	-0.62 ^b	1.25 ^c	99.90*

Notes: Alcohol problems were measured using the Young Adult Alcohol Problems Screening Test (scores range from 0 to 27) for the exploratory sample and the Young Adult Alcohol Consequences Questionnaire (range 0-42) in the replication sample. Different superscripts indicate clusters that are significantly different from other clusters in the same sample at $p < .05$.

* $p < .001$.

Panel A ($n = 393$) Panel B ($n = 289$)

FIGURE 1. Cluster solutions for the exploratory (Panel A) and replication (Panel B) samples

TABLE 5. Cluster membership by campus

Cluster	Project 1 (<i>n</i> = 225) <i>n</i> (%)	Project 2 (<i>n</i> = 38) <i>n</i> (%)	Project 3 (<i>n</i> = 130) <i>n</i> (%)	Project 4 (<i>n</i> = 289) <i>n</i> (%)
"Why Me?"	28 (12.4%)	13 (34.2%)	74 (56.9%)	150 (51.9%)
"So What?"	31 (13.8%)	22 (57.9%)	44 (33.8%)	85 (29.4%)
"Bad Incident"	166 (73.8%)	3 (7.9%)	12 (9.2%)	54 (18.7%)

and aversiveness. Given these characteristics we labeled this cluster of students "Bad Incident."

Replication cluster analysis

We used the *k* means procedure to produce a three-cluster solution with the data from Project 4. MANOVA revealed significant between-cluster differences across the five clustering variables, as indicated by the Pillai-Bartlett multivariate test statistic ($V = 1.13$; $F = 73.70$, 10/566 df, $p < .001$). Univariate ANOVAs revealed significant cluster differences on each variable as well (Table 4). As can be seen in Table 4 and Figure 1, the exploratory and replication results were very similar. Once again, Cluster 1 ("Why Me?") members were light drinkers who did not drink heavily in the incident, did not assume responsibility for the incident, and did not find the incident aversive. Cluster 2 ("So What?") was also similar to the exploratory analysis, with the exception that the level of responsibility was higher than in the initial sample (although still in between the other clusters). Finally, Cluster 3 ("Bad Incident") was also very similar to the initial solution, with low levels of heavy drinking, high levels of responsibility and aversiveness, and the highest levels of all clusters of drinking before the incident.

Cluster membership by project is presented in Table 5. Clusters are distributed unevenly across the projects ($\chi^2 = 249.02$, 6 df, $p < .001$). Relative to the other clusters, the campus in Project 1 had a high number of "Bad Incident" cases, Project 2 had a high number of "So What?" cases, and Projects 3 and 4 had a high number of "Why Me?" cases.

Cross-replication

The size of our final combined database ($N = 682$) allowed for an additional cross-replication of the three-cluster solution (Rapkin and Luke, 1993). This was done in three steps. First, we randomly divided the sample using the SPSS 14.0 data select command to randomly select approximately 50% of cases producing two samples ($n_1 = 338$, $n_2 = 344$). Second, we used the *k* means procedure to produce three clusters within each sample, which were consistent with the "Why Me?," "So What?," and "Bad Incident" profiles. Third, on one sample (n_1), we conducted a discriminant function analysis (DFA; Johnson and Wichern, 1998) to assign members of each subsample to three different groups. The equations in the DFA included the five variables used in the *k* means procedures. Thus, the equations determine whether groups differ in regards to the means of the variables (identical to a MANOVA) and then use those variables to assign group membership.

There were significant differences among all three groups on the five variables (p 's $< .001$), and examination of the standardized betas for each of the five variables indicated that each contributed significantly to the classifications. However, these assignments can be optimistically biased, because the data in this half of the sample are also used to develop the equations used to assign to the groups. Therefore,

TABLE 6. Raw external variables by cluster in the exploratory and replication samples

Variable	Exploratory sample (<i>n</i> = 393)				Replication sample (<i>n</i> = 289)			
	"Why Me?" (<i>n</i> = 115; 29.3%)	"So What?" (<i>n</i> = 97; 24.7%)	"Bad Incident" (<i>n</i> = 181; 46.1%)	Statistic	"Why Me?" (<i>n</i> = 150; 51.9%)	"So What?" (<i>n</i> = 85; 29.4%)	"Bad Incident" (<i>n</i> = 54; 18.7%)	Statistic
Age, mean (SD)	19.1 (0.84) ^a	19.1 (1.01) ^a	18.8 (0.89) ^a	$F = 3.83$, * 2/390 df	18.7 (0.81)	18.8 (0.94)	18.5 (0.91)	$F = 1.91$, 2/286 df
% Male	49 ^a	66 ^b	41 ^a	$\chi^2 = 15.27$, ‡ 2 df	59 ^a	75 ^b	67 ^{a,b}	$\chi^2 = 6.67$, * 2 df
% Freshman	46 ^a	53 ^a	68 ^b	$\chi^2 = 33.87$, ‡ 6 df	67	64	80	$\chi^2 = 9.26$, 6 df
Violation type								
Presence	43 (37%)	6 (6%)	4 (2%)	$\chi^2 = 240.06$, ‡ 6 df	14 (9%)	3 (4%)	0 (0%)	$\chi^2 = 71.39$, ‡ 6 df
Possession	55 (48%)	59 (61%)	12 (7%)		131 (87%)	77 (91%)	31 (57%)	
Behavior	3 (3%)	10 (10%)	11 (6%)		4 (3%)	4 (5%)	13 (24%)	
Medical	14 (12%)	22 (23%)	154 (85%)		1 (1%)	1 (1%)	10 (19%)	
No. of drinking days, past month	5.30 (3.32) ^a	11.05 (4.03) ^b	4.55 (2.76) ^a	$F = 135.72$, ‡ 2/388 df	7.74 (3.73) ^a	14.02 (5.21) ^b	9.40 (5.05) ^a	$F = 53.98$, ‡ 2/286 df
Drinks per drinking day, past month	5.09 (3.06) ^a	8.02 (2.77) ^b	4.78 (2.79) ^a	$F = 41.22$, ‡ 2/368 df	5.58 (2.44) ^a	8.42 (2.55) ^b	7.32 (2.95) ^c	$F = 34.59$, ‡ 2/285 df
No. of days used cigarettes, past month	2.25 (6.69) ^a	5.06 (9.50) ^b	3.28 (7.85) ^{a,b}	$F = 3.29$, * 2/389 df	5.53 (10.07)	8.14 (11.17)	5.54 (11.15)	$F = 1.81$, 2/286 df
No. of days used marijuana, past month	1.32 (4.29) ^a	3.45 (5.23) ^b	1.44 (2.85) ^a	$F = 9.84$, ‡ 2/389 df	2.04 (5.33) ^a	7.13 (9.88) ^b	3.26 (6.93) ^a	$F = 13.57$, ‡ 2/286 df

Notes: Different superscripts indicate clusters that are significantly different from other clusters in the same sample at $p < .05$.

* $p < .05$; ‡ $p < .001$.

we used the DFA equations to classify participants in n_2 . A cross-tabulation comparing group membership determined by the DFA with the participants' cluster memberships indicated a high level of agreement (88%). In sum, the groups identified by the DFA replicated the clusters created by the k means clustering procedure, indicating that the three clusters are highly reliable.

External variables

We examined between-cluster differences on demographic and behavioral external variables in the exploratory and replication samples (Table 6). MANOVAs on the five continuous external variables (age, number of drinking days in the past month, number of drinks per drinking day, number of days smoking cigarettes, and number of days smoking marijuana) revealed significant between-cluster differences for both the exploratory sample ($V = .51$; $F = 25.00$, 10/730 df, $p < .001$) and the replication sample ($V = .39$; $F = 13.72$, 10/564 df, $p < .001$).

The follow-up univariate tests showed higher significance in the larger exploratory sample, but the post hoc comparisons between cluster groups were very similar across the two samples, with no age differences between individual clusters in either sample, high proportions of men in the "So What" cluster, and high proportions of freshmen in the "Bad Incident" cluster.

In both samples, the "So What?" group showed a riskier overall pattern of substance use consistent with findings from the cluster analysis. Examination of the violation types revealed consistent findings in both samples; the "Why Me?" and "So What?" groups received a higher proportion of possession or presence infractions, whereas the "Bad Incident" group was overrepresented in behavioral and medical referrals. (When the clusters were compared on the external variables for the individual campuses, statistical significance was consistent with the combined sample [Table 6]. Tables that break down the individual campuses on the external variables are available from the first author.)

Discussion

This study used data from almost 700 students across four campuses with different alcohol-use rates and alcohol policies to identify three specific profiles of mandated students. Both exploratory and confirmatory methods were used to derive these profiles based on the students' recent heavy alcohol use and alcohol problems, alcohol use during the referral incident, and perceived responsibility and aversiveness of the referral event. Demographic and other substance-use variables were consistent with the identified clusters and provided additional perspective about the types of violations within each cluster. Although the campuses included in this study were heterogeneous, we were able to

identify and replicate a three-cluster solution that reflected meaningful groupings of students.

With the exception of Project 3, freshmen were overrepresented in the project samples and represented just less than two thirds of the entire group of students studied. This is consistent with other reports of alcohol-related problems (Harford et al., 2003), alcohol-related arrests and citations (Cohen and Rogers, 1997; Thompson et al., 2006), alcohol intoxication (Bergen-Cico, 2000; Wright and Slovis, 1996), and mandatory intervention (Barnett et al., 2007; LaBrie et al., 2006a). Some of the projects included only first-time offenders, who are more likely to be freshmen. Freshmen are also more likely than students in other years to live on campus, where monitoring by residential life and campus police is higher. It is also possible that older students develop support systems and patterns of drinking that are less likely to result in extreme situations. Although across projects freshmen proportions were high, their representation in the different projects was quite varied. This may reflect how the different policies and/or enforcement resulted in the identification of students in different classes.

Cluster descriptions

Each cluster had a meaningful number of students, indicating that the profiles occur with some degree of frequency across the campuses. The cluster that we labeled "Why Me?" was characterized by below-average levels of prior alcohol use and problems, drinking in the referral incident, and feelings of responsibility. In addition, the majority of cases in this cluster across both samples (92%) had received possession or presence violations on their campus. Therefore, individuals in this cluster were relatively low-risk students who had an incident that was low in severity compared with medical incidents or more complex alcohol-related infractions.

In contrast, the "So What?" profile showed above-average levels of prior alcohol use and problems, moderate levels of drinking in the incident and responsibility, and low levels of aversiveness. Although the majority of these cases also had possession or presence violations (80%), this cluster was distinct in that it had a higher proportion of male students and had significantly higher alcohol and drug use than the other two clusters.

The "Bad Incident" group was characterized by low prior alcohol use and low to moderate prior alcohol problems but high levels of aversiveness, responsibility, and incident drinking. Members of this cluster were more likely to be first-year students, but this group was not as clearly characterized by the type of incident as the other clusters. A high proportion (70%) had been medically evaluated for intoxication, and of all of the behavioral infractions, 53% of them occurred in this "Bad Incident" group.

Differences between the exploratory and replication analyses. There were important differences between the two samples that may reflect variations in campus policy and enforcement. In the exploratory sample, the largest proportion of participants was in the "Bad Incident" cluster (46%), whereas in the replication sample the largest proportion was in the "Why Me?" cluster (52%). One of the campuses in the first sample has its own emergency medical service and overnight infirmary and a well-publicized medical amnesty policy for alcohol. Most of the medical cases from this campus were included in the "Bad Incident" cluster. This difference also may be related to the class-year differences in the exploratory sample, because freshmen tend to be over-represented in medical cases (Wright and Slovis, 1996). Another reason for the difference in the demographic variables was that there was greater heterogeneity in the exploratory sample, which comprised three campuses. However, both the exploratory and replication samples had high numbers of possession violations, and these violations accounted for a high proportion of the "Why Me?" and "So What?" clusters in both samples.

Limitations

The four samples in this study were drawn from private colleges in New England, and the results may not generalize to larger public universities or colleges in other regions. Not all eligible students were enrolled. Only those who volunteered to participate in the research were included; therefore, the cluster solution generalizes only to study participants, not necessarily to all mandated students. The time between the incident and assessment, typically a matter of weeks, may have affected the accuracy of self-reported drinking in the incident. Measurement of participant alcohol use reflected the period before the assessment, not necessarily before the incident; therefore, interpretations about temporal relationships should be made cautiously. For example, the lower alcohol use in the "Bad Incident" group could have preceded or followed the incident itself, or both. Use rates in this cluster could reflect a naïve presentation, such that a serious incident occurred in the context of little experience with alcohol, or the low levels of alcohol could have followed (i.e., been in response to) a serious incident (cf. White et al., 2008). Unfortunately, not all of our data sets had a measure of alcohol use between the incident and the assessment; therefore, we were not able to specify a temporal relationship between the incident and alcohol use. (Projects 1 and 4 measured alcohol use before the incident as well. Although these time frames overlap in some cases, in both projects the difference in number of heavy drinking days the month before the incident was not significantly different from the month before the assessment [Project 1: $t = 0.69$, 219 df, NS; Project 4: $t = 0.58$, 255 df, NS].) We did, however, include past-year alcohol problems as a clustering variable; therefore, problem

behavior before the incident was included. Other variables that may be relevant (e.g., motivation to change) were not available in all data sets and therefore were not included.

External events may have influenced results. Projects 2 and 3 had mandatory interventions that occurred before the baseline assessment for the research trials. Students who received an alcohol violation or had a medical emergency also may have had contact with police, resident assistants, friends, family, or medical practitioners; any of these contacts may have affected the student's subsequent report to researchers. Although we included campuses with different policies, the degree of generalizability to any one campus will be limited by the extent to which its policies and practices are similar to our campuses.

Implications for college policies and interventions

Reports of students who are sanctioned for alcohol-related behavior indicate that they have low problem recognition (Caldwell, 2002), and very few mandated students report that they would have sought help if they had not been required to do so (Barnett et al., 2004). Despite the low likelihood of self-referral, many students will have experienced negative consequences from their drinking, both in the recent past and as a proximal result of the recent incident. Requiring interventions for students who have alcohol-related incidents, therefore, is an appropriate response that allows a university to evaluate the students' levels of risk, provide additional intervention when necessary, and facilitate change with a greater number of students than would benefit otherwise.

Recommendations for intervention response may best be based on violation type. In the present study, we found that those who received possession and presence violations (who tended to belong to the "Why Me?" and "So What?" clusters) generally had low feelings of responsibility for the incidents and, therefore, might have found it difficult to find meaning in the violation or subsequent interventions. In addition, heavier drinkers were more likely to be found in the "So What?" group but generally did not show a strong negative reaction to their incident. Students in these two groups may benefit from interventions that use Motivational Interviewing (Miller and Rollnick, 2002) to explore ambivalence about alcohol use, whereas providing advice or specific strategies to reduce drinking may not be well received.

In contrast, those in the "Bad Incident" cluster had the highest personal attribution for the incident and reported the highest aversiveness, a profile in mandated students that is related to greater motivation to change alcohol use (Barnett et al., 2006). Their pattern of low alcohol use and problems places these students at relatively low risk (especially relative to the "So What?" group) for future problems. However, policies that require intervention for these individuals provide the opportunity to process the severity of the incident and evaluate the degree of further risk, thereby possibly

preventing further heavy alcohol use. These students may be more interested in avoiding subsequent consequences from drinking and may be more open to specific strategies or suggestions on how to make or maintain reductions in their alcohol use.

Individuals who received a violation for being in the presence of alcohol were at comparatively lower risk than students with other violation types; 81% of the "presence" cases were assigned to the "Why Me?" group, which had low levels of prior alcohol use and incident drinking. Citing students for being in the presence of alcohol provides an opportunity to intervene with a larger group, but such low threshold policies inevitably result in a higher number of student cases, which may overwhelm resources. Alternatives to in-person interventions such as personalized feedback reports fare well compared with more intensive interventions (e.g., Murphy et al., 2004; Walters and Neighbors, 2005; White, 2006) and show some promise in referred populations (White et al., 2006). Policies that apply lesser sanctions or fines but no additional intervention for first offenses and/or lower severity offenses such as presence violations (Cohen and Rogers, 1997) or that use stepped-care approaches (Borsari et al., 2007) could lower the use of more resource-intensive interventions, but such approaches have not been well studied.

The recommendations above notwithstanding, research is needed to establish whether the clusters derived in this study moderate the efficacy of sanctions or interventions, that is, whether individuals in the clusters react differentially to college responses to their incidents. Prior experience with alcohol and individual responses to the incident and sanction, in particular, may predict motivation (cf. Barnett et al., 2006) and behavior change and may interact with intervention components. Differential intervention efficacy across individual constructs or clusters would support the derivation of simple but functional systems for classifying students on the basis of measured behaviors and reactions. Such a system would be useful for campus responses to alcohol-related incidents.

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