Group Alcohol Climate, Alcohol Consumption, and Student Performance

Jennifer Carson, Julian Barling, and Nick Turner
Queen's University

This study explored the relationship between group norms for drinking and two indicators of student performance. Based on data from 96 undergraduate students (mean age = 22 years) living in 21 student houses, the multilevel hypotheses that (a) house alcohol climate is associated with student alcohol consumption, (b) student alcohol consumption is associated with student withdrawal behavior (i.e., absence from class), and (c) that student alcohol consumption mediates the link between house alcohol climate and student withdrawal behavior are supported. No link between student alcohol consumption and student academic performance (i.e., average grades) was found. Similarly, there was no empirical support for the hypothesis that house cohesion would moderate the relationship between house alcohol climate and student alcohol consumption. Implications for future research are discussed.

Keywords: group climate, alcohol, grades, performance, absence

Alcohol use among students in college settings continues to be a widely studied area of research (Perkins, 2002; Presley, Meilman, & Cashin, 1996; Wechsler, Davenport, Dowdall, Moeykens, & Castillo, 1994). High levels of alcohol consumption stereotypically characterize the college student lifestyle and the negative health and developmental consequences (e.g., unintentional injuries, unsafe sex, and criminal violations) remain of considerable concern to public health officials (Perkins, 2002).

In an attempt to create effective prevention programs, researchers have studied the antecedents to alcohol use and abuse in college student populations. One body of research has focused on the individual antecedents to drinking behavior. Studies in this area have concluded that both retrospective reports of precollege alcohol use (Simons et al., 2005) and individual differences in motivation (O'Connor & Colder, 2005) have significant influence on drinking.

Despite this, perhaps the most studied antecedent in this literature is at the collective level, namely the social context, which comprises the social, environmental, and psychological factors that influence drinking (Baer, 2002; Simons et al., 2005). This line of research shows that, consistent with social norm theory, students' perceived drinking norms guide their drinking behavior (Miley & Frank, 2006). Furthering this perspective, some studies have focused on specific high-risk groups within universities, such as sororities, fraternities, and athletic teams, and found that these groups drink more often and more heavily than their peers (Cashin, Presley, & Meilman, 1998; Kilmer, Larimer, Parks, Dimeff, & Marlatt, 1999; Leichliter, Meilman, Presley, & Cashin, 1998). It has been proposed that students associate membership in these groups with popularity and increase their drinking to match the perceived group norm (Simons et al., 2005).

The purpose of this study was to take the focus on groups as predictors of individual alcohol consumption a step further. We wanted to

assess under what conditions group norms about drinking influence individual alcohol consumption, specifically whether shared perceptions within a group have an impact of alcohol use, and how group norms about drinking influence student performance, specifically academic effectiveness and absence behaviors. The potential implications of this research go beyond the college student setting: to organizational researchers, this question is interesting because of its probable implications for the world of work.

Drinking on the Job and Facet-Specific Climates

One domain in which individual-level drinking has received considerable attention is that of work (Frone, 2006). For example, there is a large body of organizational research concentrated on the link between stress and alcohol consumption, showing a consistent relationship between the two (e.g., Bacharach, Bamberger, & Sonnenstuhl, 2002; Bamberger & Barhom-Kidron, 1998; Cotton, Dollard, & de Jonge, 2002; Frone, 1999, 2003; Grunberg, Moore, Anderson-Connolly, & Greenberg, 1999; Grunberg, Moore, & Greenberg, 1998; Martin & Roman, 1996; Stewart, Zvolensky, & Eifert, 2002; Trice & Roman, 1978). Research has also addressed the effects of alienation on drinking behavior, with this perspective focusing on stress through some of its components (e.g., low job autonomy, lack of participation in decision-making, and poor skill use; Greenberg & Grunberg, 1995), as well as the extent to which individual-level expectancies about the effects of drinking moderate or mediate the relationship between stress and drinking (e.g., Frone, 1999; Grunberg et al., 1998, 1999).

A separate tradition has investigated whether collective-level variables influence individuals' drinking behavior, with much research focused on organizational culture, which sets standards for appropriate and inappropriate behavior (Van Maanen & Barley, 1984). Research shows that organizational climate (i.e., the policies, practices, and procedures that manifest the organizational culture) is associated with individual drinking (e.g., Svare, Miller, & Ames, 2004). This research, however, has focused primarily on organizational-level drinking culture.

In contrast, there has been a considerable amount of recent research (e.g., Mathiesen,

Einarsen, Jorstad, & Bronnick, 2004; Zohar, 2000) outside the field of addictive behaviors but within the organizational literature that addresses (a) facet-specific climates (e.g., innovation, workplace safety) within work teams and (b) salient outcomes (e.g., customer satisfaction, injury rates) of these team climates. In this study, we draw on both the college student alcohol use literature, as well as the organizational literature to extend the stream of research on group climates. To this end, we investigate the effects of group-level alcohol climate on individual-level student performance outcomes via alcohol consumption.

Our conceptualization of group-level alcohol climate draws heavily from Zohar's (2000, 2002; Zohar & Luria, 2004) research on safety climate. Within this social–cognitive model, individuals are agents and observers of the events that occur within their work group; these events provide members with cues to expected role behaviors, enabling them to make sense of a shared reality. In other words, the group climate reveals the shared perceptions of the policies, procedures, and practices of the group. Our conceptualization does differ somewhat from Zohar's, inasmuch as the episodes and events to which he refers frequently involve symbolic and concrete behaviors enacted by authority figures, namely work supervisors. In contrast, in the current study, the referents upon whom shared perceptions of alcohol-related behaviors are based are peers, a social group that is particularly salient among high school and college students (Wood, Read, Mitchell, & Brand, 2004). Using this conceptualization, we draw our first hypothesis:

> *Hypothesis 1:* Group-level alcohol climate will predict individual-level alcohol consumption.

Building on this relationship, organizational research has shown that the association between group-level climate perceptions and individual behavior is often moderated by third variables (e.g., Katz-Navon, Naveh, & Stern, 2005). Group cohesion has been found to act as a critical moderator in group learning outcomes (Chapman & McGregor, 2002; Wong, 2004). In the college student alcohol literature, it has been suggested that students are more sensitive to their friends than the overall social norm on

campus (Keeling, 2000), and that the amount of social contact with other students is positively related to individual drinking (Fondacaro & Heller, 1983). In highly cohesive groups (in which cues and expectations are shared among group members; Cartwright, 1968), members are more likely to comply than in groups with more divergent views on drinking. Within less cohesive groups, therefore, there may be less of a significant relationship between group-level alcohol climate and individual drinking behavior. Thus, with our second hypothesis we suggest that group cohesion will moderate the relationship between group-level alcohol climate and individual-level alcohol consumption.

> *Hypothesis 2:* The relationship between the group-level alcohol climate and individual-level alcohol consumption will be moderated by group cohesion.

Alcohol Consumption and Its Consequences

After exploring some potential predictors of individual-level drinking, it is important to consider its consequences. As already mentioned, there has been considerable interest in understanding the outcomes of young adults' drinking behavior because of its perceived developmental consequences (i.e., physical, social, academic, and psychological outcomes; Frone, 1999; Stewart et al., 2002). One frequently researched outcome in the work-related alcohol use literature is performance. To further understand this possible relationship, and given the nature of the sample used in this study, our focus is on two diverse aspects of students' performance, namely academic effectiveness and withdrawal (or absenteeism).

The notion that alcohol consumption would be associated with students' withdrawal behaviors (e.g., absence from class) is consistent with the findings from a study of students in New Zealand. Looking only at immediate (next day) effects, drinking resulted in reduced performance in terms of missing class, being late for a class, or not handing in an assignment (McGee & Kypri, 2004). This finding is also consistent with studies in the organizational literature where drinking at work has been associated with decreased task performance among young workers (Frone, 1998), and where off-

the-job drinking has been associated with withdrawal from work, but not with positive work behaviors (Lehman & Simpson, 1992). Such withdrawal behaviors are important because of the potential long-term effects that may ensue. A national study by the Core Institute (Presley et al., 1996) also found that the average number of drinks consumed per week was negatively related to grade average. Therefore, our study will assess the effects of alcohol consumption on academic performance using two specific measures: average grades and class absence.

Finally, in conceptualizing and operationalizing drinking behavior, it is important to assess both the quantity and frequency of alcohol consumption. Consuming more than five drinks on one occasion is variously termed *binge drinking* or *heavy episodic drinking*. While controversy over this definition persists, this is a standard measure used in the public health and alcohol literatures (Wechsler & Nelson, 2001). However, the notion of binge or heavy episodic drinking does not include a measure of the frequency of these forms of drinking. In this research, we focus on *alcohol consumption*, which we operationalize as both the amount of alcohol consumed (i.e., how many drinks in a particular period) and frequency of drinking (i.e., over what time period these drinks were consumed). Thus, our next set of hypotheses.

> *Hypothesis 3a:* Higher levels of alcohol consumption will be related to higher levels of students' withdrawal behavior (class absence).

> *Hypothesis 3b:* Higher levels of alcohol consumption will be related to lower levels of academic performance (academic effectiveness).

In addition to being a direct outcome of group-level alcohol climate, we also suggest that individual-level alcohol consumption will fully mediate the relationship between group-level alcohol climate and specific outcomes (see Figure 1 for the hypothesized model).

> *Hypothesis 4a:* Effect of group-level alcohol climate on students' class absence will be mediated by alcohol consumption.
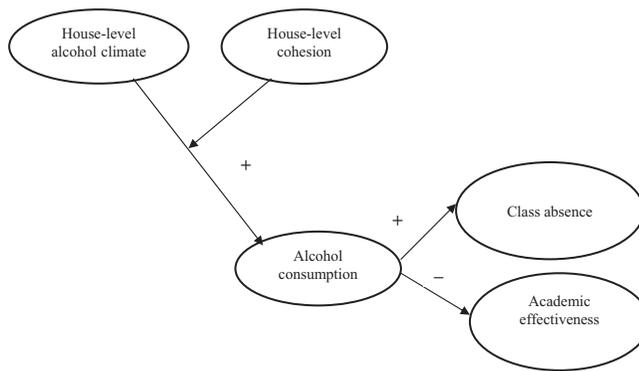
Figure 1. Hypothesized model.

Hypothesis 4b: Effect of group-level alcohol climate on academic effectiveness will be mediated by alcohol consumption.

Method

Respondents and Procedures

The 96 participants in this study (29 men, 69 women; mean age = 22 years; SD = .84; range = 19–24) were all full-time students at a midsized Canadian university who shared off-campus housing. On average, there were five students living in each house (range = 3–6).

Participants were recruited through Web postings. To encourage participation, a coupon for a pizza was given to each household that participated. Anonymity and confidentiality were guaranteed; when students agreed to participate, they were also assured that their data would still be useful and they would still receive their pizza coupon prize even if all their housemates did not participate. Houses with three or more individuals who completed surveys were retained in the data set. Twenty-one houses (totaling the 96 students) made up the final data set, with students living together in the same house for a minimum of six months before completing the survey. Surveys were distributed to students at the university, or delivered to their house by the first author. Reminders to complete the survey were sent out every two days via electronic mail following survey distribution over a period of one week.

It is not possible to determine an accurate response rate because we do not know how many students viewed the Web postings; however, 92% of surveys distributed to interested students were completed and returned.

Measures

House alcohol climate was operationalized using three items adapted from Bennett and Lehman's (1998) measure of the perceived policies, practices, and procedures regarding alcohol use at work ("My housemates like to drink after school as a way of socializing," "Talk at home is about drinking," and "My housemates drink together just to get drunk"). These items were ranked on a frequency scale from 1 to 5 ("never" to "almost always"). Intraclass correlations (ICCs) were ICC(1) = 0.43, ICC(2) = 0.77; $F(20, 75)$ = 4.35, $p < .001$, supporting the notion that house-level alcohol climate is a group-level construct. Collectively, the ICC values suggest that houses could be reliably differentiated using house-level alcohol climate. Further justification for the aggregation of within-house responses to the house level come from average $r_{wg(j)}$ values of 0.85, suggesting high within-house agreement (James, Demaree, & Wolf, 1984).

Alcohol consumption. The measure was created for the purpose of this study. A chart was constructed so that students could report on the number of alcoholic drinks they would have at a particular time, on a particular day, in an average week. The number of alcohol drinks were summed to create a continuous score of alcohol consumption.

House cohesion was measured as the within-house variance on individual perceptions of alcohol climate (items were described above).

Higher scores on this measure would indicate there was wider variation on perceptions of alcohol climate (i.e., lower cohesion) among the members of a given house than a house with a lower score on this measure.

Class absence was measured with one item asking participants how often (in number of classes) they missed in an average week.

Academic effectiveness. Students were asked to answer two questions regarding academic performance (grades): (1) to report (in percentage) their average grade in the semester prior to completing the study questionnaire; and (2) to report (in percentage) their average grade in the year before completing the study questionnaire. We took the average of the data from these two items to calculate academic effectiveness.

Analytic Strategy

We used random coefficient models (RCMs) conducted in the Nonlinear and Linear Mixed Effects program for R (Pinheiro & Bates, 2000) to test the study hypotheses. The use of RCM to Test Hypothesis 1, namely that alcohol consumption (level 1 variable) is predicted by house alcohol climate (level 2), was straightforward and is well suited for this type of analysis (Bliese, 2000; Hofmann & Gavin, 1998). Hypothesis 2 is a test of whether house alcohol climate (level 2) interacts with house cohesion (level 2) to explain incremental variance in alcohol consumption (level 1). Hypotheses 3 and 4 contribute to tests of cross-level mediation; that is, house alcohol climate (level 2) would affect class absence (level 1) and academic effectiveness (level 1) through alcohol consumption (level 1). The mediation hypothesis was tested using criteria outlined by Kenny, Kashy, and Bolger (1998), which we describe in more detail in the Results section.

Results

The descriptive statistics and zero-order correlation for the study variables appear in Table 1. It is important to note that Table 1 presents relationships among variables as if they are independent in nature, so they should be interpreted with caution before considering the multilevel analyses conducted. Nevertheless, these data suggest that house alcohol climate is correlated with alcohol consumption ($r = 0.32$;

$p < .01$) and class absence ($r = 0.24$; $p < .01$). House cohesion is related to alcohol consumption ($r = 0.16$; $p < .05$) but is not related to class absence ($r = .12$, $p > .05$) or academic effectiveness ($r = 0.06$; $p > .05$). Alcohol consumption is related to class absence ($r = 0.34$; $p < .01$) but not to academic effectiveness ($r = -0.11$; $p > .05$).

Hypothesis 1

The first hypothesis stated that house alcohol climate would be related to alcohol consumption. We conducted an RCM analysis in which alcohol consumption was regressed on house alcohol climate. Model 1 in Table 2 shows that Hypothesis 1 was supported. As predicted, individuals living in houses with higher alcohol climates were more likely to report higher consumption of alcohol.

Hypothesis 2

The second hypothesis proposed the interactive effects of house alcohol climate and house cohesion on an individual's propensity to consume alcohol. This hypothesis was tested with cross-level analysis, and the results are presented in Model 2 of Table 2. There was no significant relationship between house alcohol climate and house cohesion. The main effect of house alcohol climate on alcohol consumption remained significant, but the main effect of house cohesion was not significant. The interactive effect of house alcohol climate and house cohesion on alcohol consumption was also not significant.

Hypotheses 3 and 4

The third and fourth hypotheses proposed the remaining links necessary to establish the cross-level relationships between house alcohol climate and each of class absence and academic effectiveness, both proposed to be mediated through alcohol consumption.

To test these hypotheses, we used Kenny et al.'s (1998) four-step approach. The first step is that the independent variable (i.e., house alcohol climate) must be related to the dependent variables (i.e., class absence and academic effectiveness). The second step requires that the independent variable (i.e., house alcohol cli-

Table 1
Descriptive Statistics and Intercorrelations

Variable	N	M	SD	1	2	3	4	5
Alcohol climate	21	3.21	0.52	—				
House cohesion	21	0.49	0.23	.47**	—			
Alcohol consumption	96	15.02	11.73	.32**	0.16*	—		
Class absence	96	1.26	1.65	.24**	0.12*	0.34**	—	
Academic effectiveness	96	79.16	4.78	−0.02	−0.06	−0.11	0.05	—

Note. $N = 96$. Alcohol climate and house cohesion variables represent house means from 21 houses assigned back to individuals. The correlations and significance tests for these variables should thus be viewed with caution.
* $p < .05$. ** $p < .01$.

mate) must be related to the proposed mediator (i.e., alcohol consumption). In the third step, the mediator (alcohol consumption) must be related to the dependent variables (i.e., class absence and class effectiveness), with the independent variable (i.e., house alcohol climate) in the model. The final step in testing the mediation process requires that the significant relationship between the independent variable (i.e., house alcohol climate) and the dependent variables (i.e., class absence and academic effectiveness) revert to zero when the mediator (i.e., alcohol consumption) is included in the models.

Tables 2 and 3 summarize the data needed to address these four criteria for mediation for each of the analyses. Model 3 in Table 2 indicated that house alcohol climate was related to class absence, meeting the first criteria toward confirming the mediation hypothesis (Hypothesis 4a). As described above, Model 1 in Table 2 showed that house alcohol climate was related to alcohol consumption, supporting Hypothe-

sis 1 and the second criteria for mediation. Model 4 (see Table 2) met the third and fourth criteria that alcohol consumption was related to class absence in the presence of house alcohol climate, and that the relationship between house alcohol climate and class absence became nonsignificant when controlling for alcohol consumption. Overall, supporting Hypothesis 4a, alcohol consumption fully mediated the cross-level relationship between house alcohol climate and class absence.

In contrast, Model 1 in Table 3 shows that alcohol consumption was not related to academic effectiveness, thus failing to support Hypothesis 3b. Model 2 in the same table shows that house alcohol climate is not related to academic effectiveness, failing to meet the first criteria for mediation. Although this first criterion is not strictly necessary to test mediation (Kenny et al., 1998), the analyses presented in Model 3 in Table 3 also yield nonsignificant findings. Taken together, these data fail to find

Table 2
The Mediating Role of Alcohol Consumption on Class Absence

Variable	Parameter estimate	SE	df	t test	p
Model I: DV = alcohol consumption (Intercept)	−8.04	8.51	75	−0.95	.35
House-level alcohol climate	7.20	2.61	19	2.76	0.01
Model 2: DV = alcohol consumption (Intercept)	−10.68	10.43	75	−1.04	0.30
House-level alcohol climate	7.94	3.48	17	2.28	0.04
House cohesion	−0.10	7.53	17	−0.01	0.98
House-level alcohol climate × house cohesion	9.64	17.47	17	0.55	0.59
Model 3: DV = class absence (Intercept)	−1.17	1.17	75	−1.00	0.32
House-level alcohol climate	0.75	0.36	19	2.10	0.05
Model 4: DV = class absence (Intercept)	−0.84	1.12	74	−0.75	0.46
House-level alcohol climate	0.46	0.36	19	1.27	0.22
Alcohol consumption	0.04	0.01	74	2.89	0.1

Note. DV = dependent variable.

Table 3
The Mediating Role of Alcohol Consumption on Academic Effectiveness

Variable	Parameter estimate	SE	df	t test	p
Model 1: DV = academic effectiveness (Intercept)	78.67	0.77	72	101.18	.000
Alcohol consumption	0.86	1.00	72	0.85	.396
Model 2: DV = academic effectiveness (Intercept)	79.85	3.29	73	24.29	<.001
House-level alcohol climate	−0.21	1.00	19	−0.21	.836
Model 3: DV = academic effectiveness (Intercept)	79.51	3.22	72	24.68	<.001
House-level alcohol climate	0.11	1.02	19	0.11	.910
Alcohol consumption	−0.05	0.04	72	−1.07	.289

Note. DV = dependent variable.

support for the mediation hypothesis regarding house alcohol climate, alcohol consumption, and academic effectiveness.

Discussion

The purpose of this research was to gain a better understanding of the outcomes of group drinking norms. From the research literature on college student drinking, we know that both individual factors (O'Connor & Colder, 2005; Simons et al., 2005) and social norms (Baer, 2002; Simons et al., 2005) influence individual drinking. On the other hand, the organizational literature illustrates the relationship between facet-specific climates within work teams and salient outcomes of these specific team climates (Mathiesen et al., 2004; Zohar, 2000). Drawing on these two areas, we assessed how groups influence individual behavior, and specifically asked whether within-group shared perceptions on alcohol use (alcohol climate) affect individual-level performance. To this end, we investigated the effects of group-level alcohol climate on individual-level student performance outcomes via alcohol consumption.

Several significant findings emerged from this research. First, as predicted, there was a positive relationship between house alcohol climate and alcohol consumption; however, contrary to our hypothesis, this relationship was not moderated by house cohesion. Second, alcohol consumption predicted class absence but not academic effectiveness. Third, the relationship between house alcohol climate and class absence was fully mediated by alcohol consumption. The implications of these findings are now discussed in sequence.

The finding that house alcohol climate significantly predicted individual level alcohol consumption is interesting for two reasons. First, these findings extend the current literature on the effect of social norms and drinking in a college context. Although studies have focused on the group level for "at-risk" groups, such as fraternities, sororities, and athletic teams (Cashin et al., 1998; Kilmer et al., 1999; Leichliter et al., 1998), this remains the first study, to our knowledge, to examine the relationship between group-level climate and drinking. Second, our findings extend organizational research on climates (e.g., workplace safety climate, service climate, innovation climate, and patient safety climate), previously shown to influence individual behavior and suggest that the effects of climates for drinking can be just as pervasive.

However, contrary to our predictions and previous findings in the organizational (e.g., Bennett & Lehman, 1998; Seeman & Anderson, 1983) and college student drinking (Fondacaro & Heller, 1983; Keeling, 2000) literatures, we failed to find a moderating effect for house cohesion on the relationship between house alcohol climate and alcohol consumption. More specifically, we argued that any effects of house alcohol climate on individuals' alcohol consumption would be highest under conditions of high house cohesion but minimal in the face of low house cohesion. However, no such effect moderating emerged. Stated somewhat differently, even when house members' perceptions regarding house alcohol use were divergent, the mean alcohol climate (shared perceptions) influenced individual drinking behavior in the same way as it did in houses where there were more divergent perceptions of house alcohol

climate. Therefore, house alcohol climate influenced individual drinking behavior irrespective of house cohesion.

Second, alcohol consumption predicted class absence, although no such relationship emerged between alcohol consumption and academic effectiveness. Specifically, alcohol consumption increased the likelihood that students would be absent from class. This finding replicates results from earlier research on the consequences of alcohol use in student populations (McGee & Kypri, 2004; Perkins, 2002) and is important because the long-term consequences of withdrawing from academic activities may be negative; any factors leading to such withdrawal behaviors would need to be addressed. In addition, this parallels findings in the organizational literature that have shown work absenteeism to be a major organizational consequence of drinking (Trice & Roman, 1978). Replicating this finding among a different population (young students vs. full-time employees) in a different setting (university-based vs. organization) supports the potential generalizability of this relationship.

However, as already noted, no relationship between alcohol consumption and academic effectiveness emerged. This is surprising because previous studies have found alcohol to have a negative effect on academic performance (Benton, Schmidt, Newton, Shin, Benton, & Newton, 2004; Presley et al., 1996). A possible explanation for this is that the threshold for a decrease in academic grades was not reached in our sample; any decrease in academic grades may only emerge at more extreme levels of drinking. From a methodological perspective, it is also possible that because the measure for academic effectiveness was determined by taking the average of two averages, range restriction in the measure reduced the likelihood of finding statistically significant effects.

Our third and final significant finding was that the effect of house alcohol climate on class absence was fully mediated by alcohol consumption. In houses with a strong alcohol climate, members were likely to be absent from class more often. This extends findings in the work literature that stronger drinking climates at work are most likely to be associated with negative work consequences (Bennett & Lehman, 1999), especially absenteeism (Trice & Roman, 1978). Importantly, this effect emerged even though the current study used peer groups rather than hierarchical work groups, and the alcohol climates in these student houses still influenced one aspect of work performance (namely, class absence), emphasizing the powerful influence of the group-level climate on individual behavior. This finding is conceptually important because this finding provides information on one way in which a group-level alcohol climate affects subsequent individual-level withdrawal behaviors.

Study Limitations and Future Directions for Research

Like all research, several limitations inherent in this study should be noted. First, the exclusive reliance on self-report data may threaten the reliability and validity of the present findings for several reasons. First, in any research on alcohol in a younger sample, socially desirable responding may occur even though students were assured that responses were entirely confidential and anonymous. Given the value-laden nature of drinking behavior, students may report either higher or lower quantities and frequencies of alcohol consumption so that they may appear closer to their perceived norm. Second, accuracy of self-reports of alcohol consumption may also be in question. When students mix their own drinks, they tend to underestimate the amount of alcohol that they are consuming because they may misjudge what would typically be considered "one drink" (White, Kraus, McCracken, & Swartzwelder, 2003). Third, because this study used a cross-sectional design, causal inferences are impossible from these data. For example, although alcohol consumption could result in withdrawal from academic activities, as hypothesized, it is also possible that students who choose to be less involved in their academic activities have more leisure time available, and hence have a greater opportunity to spend more time drinking.

Several directions for future research are suggested from the design and results of the current study. The first set of recommendations involves measurement issues. This study has shown that group-level alcohol climate predicts individual alcohol use, supporting previous findings on the climate-behavior relationship. In contrast to past climate research, which used a multidimensional framework (Katz-Navon et

al., 2005), we used a unidimensional framework; future research on group alcohol climate may benefit from a multidimensional approach that incorporates aspects of alcohol climate such as sanctions/punishment, information, procedures, and communication as separate constructs. In doing so, the possibility that all relationships between group-level alcohol climate and drinking behavior are not uniformly linear might be investigated. Katz-Navon et al. (2005), for example, showed linear effects for informational aspects of the climate, but curvilinear effects for procedures. In addition, measures of both the strength and magnitude of alcohol climate might be assessed in future research (e.g., Zohar & Luria, 2004).

Second, one of the surprising findings in this study was that house cohesion did not moderate the relationship between house alcohol climate and alcohol consumption. However, there are many different types of cohesion (e.g., social cohesion, value cohesion), and this study only operationalized cohesion in terms of variation on perceptions of house alcohol climate. Given that previous studies have hypothesized that close friends have a greater impact on drinking behavior than overall norms (Keeling, 2000), it would be interesting to investigate the moderating role of other aspects of cohesion (e.g., peer cohesion) on the relationship between alcohol climate and individual level alcohol use.

Third, this study focused on the consequences of group-level climate. However, the broader organizational culture plays a role in drinking behavior (Bacharach et al., 2002), as do situational factors (e.g., stress, alienation), individual difference variables (e.g., impulsivity, risk-taking), and other demographic factors (e.g., education) (Frone, 2003; Seeman & Anderson, 1983). Thus, a comprehensive study simultaneously incorporating the three different levels of antecedents (individual, group, and organizational level) would substantially add to the prediction of work-related drinking and enable a more fair comparison (Cooper & Richardson, 1986) of their unique contributions.

Fourth, additional explanations might exist for the link between alcohol consumption and class absence. One possibility is that excessive alcohol consumption interferes with doing homework (e.g., reading, studying), and this lack of preparation causes students to avoid class; another is that physical consequences of overindulgence (e.g., hangovers) limit class attendance. It is also possible that this relationship emerges because alcohol consumption aggravates existing illnesses or causes the emergence of new ones, resulting in absences for health reasons. Further research should assess the physical health of the participants to determine whether or not illness mediates the relationship between alcohol use and class absenteeism. This relationship itself might be moderated by respondents' age. In young adults, such as in the current sample, it is likely that long-term health effects of drinking have not yet occurred; thus, the role of physical health as a mediator might best be investigated in employed samples of older individuals or samples with a greater range of ages represented.

Last, this research has practical implications for the college environment. Prevention campaigns based on social norm theory have been widely implemented to change drinking perceptions and behavior; however, the success of these efforts is unclear (Broadwater et al., 2006; Wechsler et al., 1994). It could be that a more targeted approach (i.e., at the group level) would have a greater impact. Although the college student environment and experience contains many features unique to students, our findings might also be used to better understand alcohol consumption in the work environment. For example, our findings may provide insight into what factors might discourage employees from drinking heavily. Therefore, it would be beneficial to assess the generalizability of these findings to other contexts, including the work environment.

In conclusion, this study has shown the relationship between house-level alcohol climate and two individual level behaviors, namely alcohol consumption and academic withdrawal. More specifically, our findings showed that the effect of group-level alcohol climate on individual-level drinking was independent of group cohesion and that the relationship of group level alcohol climate and students' withdrawal behaviors were fully mediated by individual level alcohol consumption. If the present results are replicated in different contexts and with different samples, this research would show how group-level climates affect individual behaviors and consequences and suggest the possible importance of targeting and changing group climates to reduce potentially negative consequences.

References

Bacharach, S. B., Bamberger, P. A., & Sonnenstuhl, W. (2002). Driven to drink: Managerial control, work-related risk factors, and employee problem drinking. *Academy of Management Journal, 45,* 637–658.

Baer, J. (2002). Student factors: Understanding individual variation in college drinking. *Journal Studies on Alcohol, 12,* 40–53.

Bamberger, P. A., & Barhom-Kidron, A. (1998). Spirits at work in the Promised Land: Ethnic identity, work-related risk factors, and drinking behavior among Israeli Jews. *The Journal of Applied Behavioral Science, 34,* 445–467.

Bennett, J. B., & Lehman, W. E. K. (1998). Workplace drinking climate, stress, and problem indicators: Assessing the influence of teamwork (group cohesion). *Journal of Studies on Alcohol, 59,* 608–618.

Benton, S., Schmidt, J., Newton, F., Shin, K., Benton, S., & Newton, D. (2004). College student protective strategies and drinking consequences. *Journal Studies on Alcohol, 65,* 115–121.

Bliese, P. D. (2000). Within-group agreement, non-independence, and reliability: Implications for data aggregation and analyses. In K. J. Klein & S. W. J. Kozlowski (Eds.), *Multilevel theory, research, and methods in organizations: Foundations, extensions, and new directions* (pp. 349–381). San Francisco: Jossey-Bass.

Broadwater, K., Curtin, L., Martz, D., & Zrull, M. (2006). College student drinking: Perception of the norm and behavioral intentions. *Addictive Behaviors, 31,* 632–640.

Cartwright, D. (1968). The nature of group cohesiveness. In D. Cartright & A. Zander (Eds.) *Group dynamics: Research and theory* (3rd ed., pp. 91–109). NY: Harper & Row.

Cashin, J., Presley, C., & Meilman, P. (1998). Alcohol use in the Greek system: Follow the leader? *Journal of Studies on Alcohol, 59,* 63–70.

Chapman, E., & McGregor, S. (2002). Effects of interpersonal attraction on coopoerative learning outcomes for secondary level students. *Current Research in Social Psychology, 7,* 311–324.

Cooper, W. H., & Richardson, A. J. (1986). Unfair comparisons. *Journal of Applied Psychology, 71,* 179–184.

Cotton, S. J., Dollard. M. F., & de Jonge, J. (2002). Stress and student job design: Satisfaction, well-being and performance in university students. *International Journal of Stress Management, 9,* 147–162.

Fondacaro, M., & Heller, K. (1983). Social support factors and drinking among college student males. *Journal of Youth and Adolescence, 12,* 285–299.

Frone, M. R. (1998). Predictors of work injuries among employed adolescents. *Journal of Applied Psychology, 83,* 565–576.

Frone, M. R. (1999). Work stress and alcohol use. *Alcohol Research and Health, 23,* 284–291.

Frone, M. R. (2003). Predictors of overall and on-the-job substance-use among young workers. *Journal of Occupational Health Psychology, 8,* 39–54.

Frone, M. R. (2006). Prevalence and distribution of alcohol use and impairment in the workplace: A U.S. national survey. *Journal of Studies on Alcohol, 67,* 147–156.

Greenberg, E., & Grunberg, L. (1995). Work alienation and problem alcohol drinking. *Journal of Health and Social Behavior, 36,* 83–102.

Grunberg, L., Moore, S., Anderson-Connolly, R., & Greenberg, E. (1999). Work stress and self-reported alcohol use: The moderating role of escapist reasons for drinking. *Journal of Occupational Health Psychology, 4,* 29–36.

Grunberg, L., Moore, S., & Greenberg, E. S. (1998). Work stress and problem alcohol behavior: A test of the spillover model. *Journal of Organizational Behavior, 19,* 487–502.

Hofmann, D. A., & Gavin, M. (1998). Centering decisions in hierarchical linear models: Theoretical and methodological implications for research in organizations. *Journal of Management, 24,* 623–641.

James, L. R., Demaree, R. G., & Wolf, G. (1984). Estimating within-group interrater reliability with and without response bias. *Journal of Applied Psychology, 69,* 85–98.

Katz-Navon, T., Naveh, E., Stern, Z. (2005). Safety climate in healthcare organizations: A multidimensional approach. *Academy of Management Journal, 48,* 1073–1087.

Keeling, R. (2000). Social norms research in college health. *Journal of American College Health, 49,* 53–58.

Kenny, D. A., Kashy, D. A., & Bolger, N. (1998). Data analysis in social psychology. In D. Gilbert, S. Fiske, & G. Lindzey (Eds.), *The handbook of social psychology* (Vol. 1, 4th ed., pp. 233–265). Boston: McGraw-Hill.

Kilmer, J., Larimer, M., Parks, G., Dimeff, L., & Marlatt, G. (1999). Liability management or risk management? Evaluation of a Greek system alcohol policy. *Psychology of Addictive Behaviors, 13,* 269–278.

Lehman, W. E. K., & Simpson, D. D. (1992). Employee substance abuse and on-the job behaviors. *Journal of Applied Psychology, 77,* 309–321.

Leichliter, J., Meilman, P., Presley, C., & Cashin, J. (1998). Alcohol use and related consequences among students with varying levels of involvement in college athletics. *Journal of American College Health, 46,* 257–262.

Martin, J. K., & Roman, P. (1996). Job satisfaction, job reward characteristics, and employees' problem drinking behaviors. *Work and Occupations, 23,* 4–25.

Mathiesen, G. E., Einarsen, S., Jorstad, K., & Bronnick, K. S. (2004). Climate for work group creativity and innovation: Norwegian validation of

team climate inventory (TCI). *Scandinavian Journal of Psychology, 45,* 383–392.

McGee, R., & Kypri, K. (2004). Alcohol-related problems experienced by university students in New Zealand. *Australian and New Zealand Journal of Public Health, 28,* 321–323.

Miley, W., & Frank, M. (2006). Binge and non-binge college students' perceptions of other students' drinking habits. *College Student Journal, 40,* 259–262.

O'Connor, R., & Colder, C. (2005). Predicting alcohol patterns in first-year college students through motivational systems and reasons for drinking. *Psychology of Addictive Behaviors, 19,* 10–20.

Perkins, H. (2002). Surveying the damage: A review of research on consequences of alcohol misuse in college populations. *Journal of Studies on Alcohol, 14,* 91–100.

Pinheiro, J. C., & Bates, D. M. (2000). *Mixed effects models in S and S-Plus.* New York: Springer-Verlag.

Presley, C., Meilman, P., & Cashin, J. (1996). *Alcohol and drugs on American college campuses, Volume IV: 1992–94.* Core Institute, Center for Alcohol and Other Drug Studies, Southern Illinois University at Carbondale, IL.

Seeman, M., & Anderson, C. (1983). Alienation and alcohol: The role of work, mastery and community in drinking behavior. *American Sociological Review, 48,* 60–77.

Simons, L., Klichine, S., Lantz, V., Ascolese, L., Deihl, S., Schatz, B., Wright, L., (2005). The relationship between social-contextual factors and alcohol and polydrug use among college freshmen. *Journal of Psychoactive Drugs, 37,* 415–424.

Stewart, S. H., Zvolensky, M. J., & Eifert, G. H. (2002). The relations of anxiety sensitivity, experiential avoidance, and alexithymic coping to young adults' motivations for drinking. *Behavior Modification, 26,* 274–296.

Svare, G., Miller, L., & Ames, G. (2004). Social climate and workplace drinking among women in a male-dominated occupation. *Addictive Behaviors, 29,* 1691–1698.

Trice, H. M., & Roman, P. (1978). *Spirits and demons at work: Alcohol and other drugs on the job.* Ithaca, NY: Cornell University Press.

Van Maanen, J., & Barley, S. R. (1984). Occupational communities: Culture and control in organizations. *Research in Organizational Behavior, 6,* 287–365.

Wechsler, H., Davenport, A., Dowdall, G., Moeykens, B., & Castillo, S. (1994). Health and Behavioral Consequences of Binge Drinking in College: A National Survey of Students at 140 Campuses. *The Journal of the American Medical Association, 272,* 1672–1677.

Wechsler, H., & Nelson, T. (2001). Binge drinking and the American college student: What's five drinks? *Psychology of Addictive Behaviors, 15,* 287–291.

White, A., Kraus, C. L., McCracken, L. A., & Swartzwelder, S. (2003). Do college students drink more than they think? Use of a free pour paradigm to determine how college students define standard drinks. *Alcoholism: Clinical and Experimental Research, 27,* 1750–1756.

Wong, S. (2004). Distal and local group learning: Performance trade-offs and tensions. *Organization Science, 15,* 645–656.

Wood, M. D., Read, J. P., Mitchell, R. E., & Brand, N. H. (2004). Do parents still matter? Parent and peer influences on alcohol involvement among recent high school graduates. *Psychology of Addictive Behaviors, 18,* 19–30.

Zohar, D. (2000). A group-level model of safety climate: Testing the effect of group climate on microaccidents in manufacturing jobs. *Journal of Applied Psychology, 85,* 587–596.

Zohar, D. (2002). The effects of leadership dimensions, safety climate and assigned priorities on minor injuries in work groups. *Journal of Organizational Behavior, 23,* 75–92.

Zohar, D., & Luria, G. (2004). Climate as a social-cognitive construction of supervisory safety practices: Scripts as proxy of behavior patterns. *Journal of Applied Psychology, 89,* 322–333.

E-Mail Notification of Your Latest Issue Online!

Would you like to know when the next issue of your favorite APA journal will be available online? This service is now available to you. Sign up at http://watson.apa.org/notify/ and you will be notified by e-mail when issues of interest to you become available!