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Alcohol Involvement and Participation in Residential Learning Communities Among First-Year College Students*

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Abstract

Objective—Residential learning communities (RLCs) on U.S. college campuses are assumed to build connections between formal teaming opportunities and students' living environment. The objective of this longitudinal study was to examine the association between living in RLCs and alcohol misuse among first-year undergraduate students.

Method—A Web-based survey was self-administered to a stratified random sample of 923 first-year undergraduate students (52.7% women) attending a large Midwestern research university. The sample included 342 students who lived and participated in RLCs (termed *RLC*) and 581 students who did not participate in RLCs (termed *non-RLC*) First-year students were asked about their drinking behaviors before college, during their first semester, and approximately 6 months later during their second semester.

Results—RLC students reported lower rates of drinking than non-RLC students before college. RLC students reported lower rates of drinking and fewer alcohol-related consequences than non-RLC students during the first and second semesters. Maximum drinks in 1 day increased from precollege to first semester, and this increase was larger among non-RLC students than RLC students. The number of drinks per occasion and alcohol-related consequences increased between first semester and second semester for all students regardless of RLC status.

Conclusions—Lower rates of alcohol misuse among RLC students predate their entrance into college, and the increase in drinking from precollege to first semester is lower in magnitude among RLC students RLCs' influence involves selection and socialization processes. These findings have implications for prevention and intervention efforts aimed at incoming first-year undergraduate students.

Alcohol misuse is one of the largest public health concerns on American college campuses (Hingson et al., 2002, 2005; Perkins, 2002) and research reveals that differences in collegiate living environments are associated with differences in heavy drinking and alcohol-related consequences (Bachman et al., 1997, 2002; Presley et al., 1996; Wechsler et al., 2001). For example, students living in fraternity houses tend to have higher drinking rates (Larimer et al., 2000; Lo and Globetti, 1995) than their peers not residing in fraternity houses. By contrast, living in substance-free residence halls or with parents is associated with notably less heavy

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drinking (Bachman et al., 1997, 2002; Gfroerer et al., 1997; Wechsler et al., 2001). Despite these differences, previous studies have not examined the potential protective influences of co-curricular living arrangements such as residential learning communities (RLCs).

RLCs have been implemented on college campuses, especially large institutions, to enhance the connections between formal learning opportunities and students' living environments (Brower and Dettinger, 1998). RLCs are presumed to influence undergraduate student behaviors by changing environmental conditions such as interactions with faculty and structured activities (Inkelas et al., 2007), particularly among first- and second-year college students. Past research has revealed that students living in RLCs are significantly more likely to stay in school after their first year than students living in traditional residence halls (Pascarella and Terenzini, 1981; Stassen, 2003). Several researchers also have reported that students participating in RLCs become more involved in a range of academic and social activities (e.g., Inkelas, 1999; Inkelas and Weisman, 2003).

At least two studies have found that students living in RLCs report lower rates of alcohol use and suffer fewer alcohol-related consequences than students living in non-residential learning spaces (Brower et al., 2003; McCabe, 2001). However, these studies were cross-sectional, so selection and socialization effects could not be examined. Selection effects generally refer to the influence of those individual characteristics that steer a person toward certain experiences (and environments). Socialization effects refer to the influence of experiences (and environments) on the individual (e.g., Pascarella and Terenzini, 1991). Consideration of selection and socialization effects is central to understanding the association between alcohol misuse and college environments (Borsari and Carey, 1999; McCabe et al., 2005).

The purpose of this study was to assess whether students living in RLCs reported less alcohol use and fewer alcohol-related consequences than first-year students in traditional residence halls. Changes in alcohol involvement over time (from precollege to first semester to second semester) also were assessed to examine selection and socialization effects.

Method

A stratified random sample of 2,502 full-time first-year undergraduate students was selected to take part in a longitudinal Web-based survey. The first wave of data was collected during the fall 2005 semester (T1), and the second was collected approximately 6 months later during the winter 2006 semester (T2). At each wave, students were invited to participate in the study via a pre-notification letter that explained the study and included a URL address where the Web survey could be accessed. The pre-notification letters contained a \$2.00 pre-incentive for T1 and a \$10.00 pre-incentive for T2. As an additional incentive, participants were entered into a sweepstakes drawing that included travel vouchers, iPods, and field passes to athletic events. Informed consent was obtained online from each participant. At both waves, participants were sent up to three reminder emails (see McCabe et al. [2002] for more details on method).

At T1, participants were asked, "In the 28 days before your first day of classes at the [name of University], what is the largest number of drinks you consumed in a two-hour period?" Responses ranged from 0 to 20 drinks (mean [SD] = 2.9 [3.6]). Also at T1, participants were asked, "What is the most number of drinks that you had on any one day in the past 28 days?" Responses ranged from 0 to 23 drinks (mean = 4.4 [4.7]). Participants were asked this same question at T2, and responses ranged from 0 to 25 drinks (mean = 4.8 [4.8]). Test-retest reliability of this maximum consumption measure from T1 to T2 was .62.

Drinks per occasion at T1 and T2 were calculated using a set of items examining a respondent's alcohol consumption during the past 28 days. Participants were asked to think about their

alcohol use during the past 28 days and to indicate the following: (1) how many days they consumed at least one drink (beer, wine, or liquor), (2) the number of days when they did drink and consumed more than one drink, (3) the number of days when they drank more than one drink and consumed three or more drinks, and (4) the number of days when they drank more than three drinks and consumed six or more drinks. We used a modification of the Consumption Models Analysis Program developed by Gruenewald and Nephew (1994) to score the 28-day consumption measures and to calculate a drinks-per-occasion value for each respondent at T1 and T2. This measure of drinks per occasion has shown good predictive validity in previous research (Gruenewald and Nephew, 1994) and has been used in several recent studies examining college student drinking behavior (see Clapp et al., 2003, 2006; Reed et al., 2007).

Alcohol-related consequences at T1 and T2 were assessed using items adapted from national studies of alcohol use among college students (Presley et al., 1996; Wechsler et al., 1994). At T1 and T2, a total of 14 primary alcohol-related consequences in the past 28 days as a result of drinking were assessed (e.g., hangover, blackout, missed class, hurt or injured, trouble with police, suicidal ideations). Responses for each item ranged from “never” (1) to “10 or more occasions” (5). Because of skewness, items were recoded into dichotomous variables (0 = consequence not experienced, 1 = consequence experienced). A primary alcohol-related consequences index was created by summing the 14 dichotomous items. Scores on this index ranged from 0 to 14 at T1 (mean = 1.9 [2.1]; $\alpha = .71$).

A total sample of 1,196 first-year students from a large Midwestern public research university participated at the beginning of their first semester (T1), for a response rate of 47.8%. Participants at T1 included 456 (38.1%) students who lived and participated in RLCs (termed *RLC*) and 740 students (61.9%) who did not live in RLCs (termed *non-RLC*). Nonresponse was higher among students from non-RLCs (55.1%) than among those from RLCs (46.6%) ($\chi^2 = 16.3$, 1 df, $p < .01$). To assess nonresponse bias, we conducted a telephone follow-up survey of a random sample of 640 RLC and non-RLC students who did not respond to the T1 survey. A total of 221 nonrespondents participated, for a response rate of 34.5%. The most common reason for nonresponse was “too busy” (45.7%). There were no statistically significant differences between T1 responders and T1 nonresponders in lifetime frequency of drinking, past 12-month frequency of drinking, or alcohol-related consequences. Nonrespondents reported significantly lower frequency of drinking and lower rates of one episode of heavy episodic drinking during the past 28 days.

Approximately 6 months later, when students were in their second semester of college, all of the original T1 participants were invited to participate in the T2 survey, and 77.2% of the original T1 sample ($n = 923$) completed the survey. Of those who participated in both waves, the final longitudinal sample included 342 (37.1%) RLC students and 581 (62.9%) non-RLC students. The final longitudinal sample consisted of 52.7% females and 47.3% males. The racial/ethnic composition of the longitudinal sample was 68.4% white, 10.7% Asian, 5.2% Hispanic, 5.1% black, and 10.6% reporting another racial/ethnic category. Attrition analyses revealed that there were no significant differences between those who participated at T1 and those at T2 in terms of gender, race/ethnicity, RLC status, lifetime frequency of alcohol consumption, or past-year frequency of alcohol consumption.

Results

We used the framework outlined in Jaecard (1998) to examine the main and interactive effects of Time, RLC Status and Gender on alcohol involvement. A 2 (RLC Status: RLC vs non-RLC) \times 2 (Gender: male vs female) \times 3 (Maximum Drinks in 1 Day: precollege, T1, and T2) mixed-factorial repeated-measures analysis of covariance (ANCOVA) with race/ethnicity as a covariate showed a significant main effect of time ($F = 146.5$, 1/777 df, $p < .01$), and simple

main effects analyses showed that maximum drinks increased significantly (p 's < .01) from precollege (mean = 2.7) to T1 (mean = 3.9) and from T1 to T2 (mean = 4.4). There was also a significant main effect of RLC Status ($F = 13.9$, 1/777 df, $p < .01$), and maximum drinks were higher among non-RLCs (mean = 4.2) compared with RLCs (mean = 3.1). Further, a significant main effect of gender ($F = 30.9$, 1/777 df, $p < .01$) showed that maximum drinks were higher among males (mean = 4.5) compared with females (mean = 2.9). Results also showed that the two-way Time \times RLC Status interaction was significant ($F = 4.1$, 1/777 df, $p < .05$), as was the two-way Time \times Gender interaction ($F = 7.2$, 1/777 df, $p < .01$). However, the three-way Time \times RLC Status \times Gender interaction was not significant ($F = 1.1$, 1/777 df, Ns).

We then conducted two single degree-of-freedom interaction contrasts. For each contrast we calculated the interaction parameter estimate (IPE; Jaccard and Guilamo-Ramos, 2002), which reflects the difference between non-RLC and RLC students in changes in drinking behavior over time. For the first interaction contrast, the IPE was $-.71$ ($p < .01$), indicating that the increase in maximum drinks from precollege to T1 was .71 drinks larger among non-RLC students (precollege mean = 3.0; T1 mean = 4.5) than among RLC students (precollege mean = 2.4; T1 mean = 3.2). The second interaction contrast was not statistically significant (IPE = .13, $p = .6$), indicating that although both non-RLC and RLC students showed increases in maximum drinks from T1 to T2, they did not differ in terms of the magnitude of the increase. Because these results indicated RLC differences in precollege drinking, we controlled for this variable in subsequent analyses.

Change in drinks per drinking occasion in past 28 days from T1 to T2

The number of drinks per drinking occasion in the past 28 days was subjected to a 2 (Time: T1 vs T2) \times 2 (RLC Status: RLC vs non-RLC) \times 2 (Gender: Female vs Male) mixed-factorial ANCOVA, with precollege drinking and race/ethnicity as covariates. A significant main effect of time showed that drinks per drinking occasion increased from T1 (mean = 2.6) to T2 (mean = 3.1) ($F = 8.7$, 1/788 df, $p < .01$). A main effect of RLC status was also observed ($F = 11.5$, 1/788 df, $p < .01$), and RLC students reported fewer drinks per drinking occasion (mean = 2.6) than non-RLC students (mean = 3.1). In addition, males reported more drinks per drinking occasion in the past 28 days (mean = 3.1) than females (mean = 2.5) ($F = 13.9$, 1/788 df, $p < .05$). None of the two- or three-way interaction effects were statistically significant.

Change in alcohol consequences in past 28 days from T1 to T2

A 2 (Time: T1 vs T2) \times 2 (RLC Status: RLC vs non-RLC) \times 2 (Gender: Female vs Male) mixed-factorial ANCOVA with precollege drinking and race/ethnicity as covariates showed a main effect of time, with negative drinking consequences in the past 28 days increasing from T1 (mean = 1.6) to T2 (mean = 2.4) ($F = 56.7$, 1/586 df, $p < .01$). A main effect of RLC Status also was observed ($F = 6.3$, 1/586 df, $p < .05$), and RLC students reported fewer negative drinking consequences on average (mean = 1.9) than non-RLC students (mean = 2.2). None of the two- or three-way interaction effects were statistically significant.

Reasons for living in current residence hall

We analyzed data from a question that asked participants' level of agreement (1 = strongly disagree, 7 = strongly agree) with the statement: "I chose to live in my current residential learning environment because *my parents wanted me to live here.*" RLC students expressed a significantly higher level of agreement with this statement (mean = 2.7) than non-RLC students (mean = 2.3) ($t = 3.8$, 1,136 df, $p < .01$).

Discussion

Previous research has found that undergraduate collegiate living arrangements can be either positively or negatively associated with drinking behaviors (Bachman et al., 1997, 2002; Gfroerer et al., 1997; Wechsler et al., 2001). Although RLCs were not originally developed to reduce alcohol misuse, the present study provides preliminary evidence that these co-curricular communities provide environments for students who prefer a more academically centered, less drinking-centered living arrangement.

Data from the present study support the influence of selection effects among first-year undergraduate students; indeed, the present study adds to existing literature by demonstrating a strong selection effect between RLCs and alcohol misuse. Specifically, first-year undergraduate students who drink less before college are more likely to select RLCs, which may partially explain why RLC students reported less drinking during college. We also found that RLC students experienced fewer alcohol-related consequences than non-RLC students. Taken together, these results revealed strong selection effects. Further, consistent with previous work that showed associations between parental variables (e.g., support and communication) with adolescent substance use (Wills and Yaeger, 2003), the results suggest that these selection effects may have been driven, at least in part, by parental influence.

Results also revealed possible socialization effects; specifically, non-RLC students showed a stronger increase in drinking from precollege to T1 than RLC students. By contrast, RLC and non-RLC students showed about the same degree of increase in drinking from T1 to T2, suggesting that RLCs' protective effects may be limited to the transition to college. Although we did not examine the mechanisms underlying these protective effects, our results are consistent with recent work showing that greater involvement in social networks with fewer drinkers is associated with lower levels of alcohol involvement (cf Reifman et al., 2006). In addition, RLCs could deter heavy drinking by providing alternative activities (e.g., interactions with faculty and structured co-curricular activities) that could be less available to non-RLC students.

There are some limitations concerning the implications of this investigation. First, the present study relied on retrospective recall of precollege drinking and did not prospectively follow the sample before entrance into college. Also, unlike the measures at T1 and T2, the precollege drinking measure was limited to the maximum number of drinks in a 2-hour period. Second, the sample was drawn from a single institution and this limits the generalizability of the findings. Third, longitudinal data are needed to characterize the mechanisms by which participation in RLCs may influence alcohol involvement and researchers should consider more rigorous study designs.

Despite these limitations, the present data suggest RLCs may provide colleges and universities an economical and practical way to offer living arrangements to incoming undergraduate students who may prefer an environment with lower rates of alcohol misuse. Future longitudinal data from this study will be used to examine the mechanisms and characteristics of RLCs that may influence student behavior over time.

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