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Abstract

Introduction: First-generation college students are those whose parents have not completed a four-year college degree. The current study addressed the lack of research on first-generation college students' alcohol use by comparing the binge drinking trajectories of first-generation and continuing-generation students over their first three semesters. The dynamic influence of peer and parental social norms on students' binge drinking frequencies were also examined.

Methods: 1,342 college students (n = 225 first-generation) at one private University completed online surveys. Group differences were examined at Time 1, and latent growth-curve models tested the association between first-generation status and social norms (peer descriptive, peer injunctive, parental injunctive) on binge drinking trajectories.

Results: Overall, binge drinking frequency tended to decline over the first three semesters of college. After controlling for demographics, substance-free dormitory residence, parental alcohol problems and norms, first-generation status was associated with steeper declines in binge drinking frequency. During the first semester, the association between parental injunctive norms and binge drinking frequency was stronger for first-generation students than for continuing-generation students; this influence declined over time for first-generation students. The influence of peer descriptive norms on binge drinking increased for continuing-generation students; while this influence remained stable over time for first-generation students.

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Conclusions: First-generation student status appears to be protective against binge drinking. Substance-free dormitory residence, and perceived parental and peer norms likely play a role in first-generation students' tendency to engage in binge drinking less over the first year of college.

Keywords

First-generation; college; alcohol; social norms

1. Introduction

Alcohol is the most commonly used substance among full-time college students in the United States (Schulenberg, J. E. Johnston, O'Malley, Bachman, Miech, & Patrick, 2018). Binge drinking (consuming 4/5 or more alcoholic drinks in one sitting for females/males) is common among college students and is associated with a variety of negative consequences (Wechsler, Lee, Nelson, & Kuo, 2002; A. White & Hingson, 2013). Current estimates indicate that nearly 38% of college students aged 18-22 engaged in binge drinking in the past month (Substance Abuse and Mental Health Services Administration [SAMHSA], 2015). While previous research has identified groups of students at higher risk for experiencing negative alcohol consequences (e.g., fraternity and sorority members, athletes), other college student groups have received less attention. One such group is first-generation college students.

Although the definition varies, first-generation college students are often defined as those whose parents have not completed a four-year college degree (Toutkoushian, Stollberg, & Slaton, 2018). First-generation students are contrasted with *continuing-generation* students, who have at least one parent with a college degree (Cataldi, Bennett, Chen, & International, 2018). About 17% of full-time undergraduates attending four-year colleges are first-generation students (Eagan, Stolzenberg, Zimmerman, Aragon, Whang Sayson, & Rios-Aguilar, 2017). Compared to continuing-generation students, more first-generation students identify as racial/ethnic minorities, come from low-income households, and report financial barriers to attaining a higher education (Eagan et al., 2017).

While existing research has brought attention to the unique academic, social, and familial challenges that first-generation students face (Cataldi et al., 2018; Saenz, Hurtado, Barrera, Wolf, & Yeung, 2007), little is known about first-generation students' alcohol use, when compared to that of continuing-generation students. One study found that first-generation student status was associated with less heavy drinking (Martinez, Sher, Krull, & Wood, 2009), but another did not find an association between first-generation status and heavy drinking during the first semester (Sher & Rutledge, 2007). Potential drinking differences between these two groups of students may be related to socioeconomic status, which has been positively associated with college student alcohol problems (Harrell, Huang, & Kepler, 2013). Racial and ethnic differences may also play a role, given that a higher proportion of first-generation students identify as racial and ethnic minorities, who, overall, tend to drink less than non-Hispanic White students (Antin, Lipperman-Kreda, Paschall, Marzell, & Battle, 2013; O'Malley & Johnston, 2002; Wechsler & Kuo, 2003).

Understanding first-generation students' alcohol use may be particularly important for at least two reasons. First, as students whose parents have less experience with higher education, first-generation students may receive less guidance about how to respond to prevailing alcohol use norms on campus. First-generation students may therefore feel more intense pressure than continuing-generation students to conform to perceived normative drinking behavior among their college peers, or beliefs about what kinds of drinking behaviors their student peers would approve of to "fit in." Social norms have consistently and positively been related to students' own drinking behavior (Borsari & Carey, 2003; Neighbors, Lee, Lewis, Fossos, & Larimer, 2007), but it is unknown whether first-generation and continuing-generation students differ in their susceptibility to conform to such normative beliefs.

An alternative hypothesis is that, as the first in their families to obtain a college education, first-generation students also may experience high familial pressure to succeed and therefore may be more likely to avoid problematic alcohol use than continuing-generation students. Students' perceived parental approval of alcohol use (i.e., parental injunctive norms), then, may be an indicator of familial attitudes towards alcohol use. In general, perceived parental norms are a strong predictor of college students' own alcohol use (Abar & Turrisi, 2008;Messler, Quevillon, & Simons, 2014; Rulison, Wahesh, Wyrick, & DeJong, 2016; H. R. White et al., 2006), and may be an important factor contributing to first-generation students' drinking behavior.

The Present Study

The study has three aims: Aim 1 tested whether first-generation and continuing-generation students differed regarding demographic and housing characteristics, perceived parental and peer alcohol use norms, and parental alcohol problems (assessed at Time 1). Aim 2 tested whether first-generation student status was associated with both initial levels (e.g., intercepts) and changes (e.g., slopes) in students' binge drinking trajectories, after controlling for social norms (peer descriptive, peer injunctive, and parent injunctive) and demographic variables. We hypothesized that first-generation student status would predict lower binge drinking during the first semester, and steeper declines in binge drinking frequency across students' second and third semesters. For Aim 3, we tested relationships between three social norms variables and first-generation and continuing-generation students' binge drinking trajectories. Further, we sought to understand the *magnitude* of the association between these social norms variables and binge drinking using time-varying covariate models. Assuming that first-generation students rely more on their parents' approval than their peers' approval to guide their drinking behavior, we proposed that first-generation students' binge drinking would be more strongly influenced by perceived parental injunctive norms than peer norms. We did not propose hypotheses regarding how the magnitude of the relationship between each type of norm and binge drinking frequency would change over time for Aim 3, instead leaving this as an exploratory analysis.

2. Methods

2.1 Participants and Procedures

Data come from an alcohol intervention study evaluating the effects of a brief motivational intervention, when delivered to a subset of students who were centrally positioned to influence others in the first-year student social network. Full details describing participant recruitment of the parent study are published elsewhere (Barnett et al., 2019; Ott, Light, Clark, & Barnett, 2018). All incoming first-year students were invited to participate in the parent study during the Fall 2016 semester, with limited exceptions. Thirty-one students who were either living off-campus or enrolled in a dual-degree program at a neighboring University were excluded. The University administration provided a roster and contact information for all eligible students. Recruitment methods included e-mails, postcards delivered to campus mailboxes, social media and in-person advertising, flyering, and announcements in large first-year lecture halls.

Participants completed survey assessments online during the Fall 2016 (Time 1), Spring 2017 (Time 2), and Fall 2017 (Time 3) semesters. Of the 1,660 eligible students, 1,342 (81%) enrolled and completed the Time 1 survey. Of these, 1,313 (97.8%) completed Time 2, and 1,295 (96.5%) completed Time 3. Surveys were available for a two-week period beginning six weeks after each semester began. All procedures were approved by the Institutional Review Board at the University, and all participants provided consent prior to participation.

2.2 Measures

2.2.1 Demographic and control variables.—Surveys assessed age, sex, race, ethnicity (Hispanic or non-Hispanic), receipt of financial aid, athlete status, and intentions to join a Greek-letter organization (students cannot officially join until their sophomore year at the University). Parental alcohol problems (having at least one biological parent with a "significant drinking problem—one that should or did lead to treatment") was included as a control variable, given previous associations with this variable and college alcohol use (Pearson, D'Lima, & Kelley, 2012). Surveys also assessed whether students lived on a substance-free dormitory floor, where it is expected that students will refrain from substance use.

2.2.2 First-generation college student status.—First-generation student status was obtained via self-report by asking participants, "Do you identify as a first-generation student?" (Yes / No).

2.2.3 Descriptive Norms (Peers).—*Descriptive binge drinking norms (peers)* were assessed by asking, "How many times in the past 30 days do you think the [typical first-year student of your gender] had five or more drinks on one occasion?" (0 - 30 times).

2.2.4 Injunctive Norms (Peers and Parents).—*Injunctive binge drinking norms (peers)* were assessed by asking "to what extent do you think the typical person of your same gender in your dorm would approve or disapprove of: having 5 or more drinks on one

occasion?" Response options were on a 7-point scale (Strongly disapprove [1], Moderately disapprove [2], Slightly disapprove [3], Neither approve nor disapprove [4], Slightly approve [5], Moderately approve [6], Strongly approve [7]). To assess *Injunctive binge drinking norms (for parents),* participants were first asked to name up to two influential parental figures using the instructions: "This person could be a biological parent, step-parent, foster parent, grandparent, aunts, uncle, or any other family member/friend you consider to be your parental figure." For each parental figure named, participants were asked to what extent that person would approve or disapprove of having 5 or more drinks on one occasion, using the same response scale as for peer injunctive norms. For students who named two parental figures, an average perceived approval score was calculated.

2.2.5 Alcohol consumption.—

Students' frequency of binge drinking in the past 30 days was our primary measure of alcohol consumption. Before completing survey questions assessing alcohol use, participants were presented with an image defining a standard drink as "12 oz. of beer, 5 oz. of wine or 1.5 oz. of 80-proof liquor." Binge drinking frequency was assessed by asking, "Considering all types of alcoholic beverages, how many times during the past 30 days did you have four/five or more drinks in one occasion?" Four or five was displayed for female or male-gendered participants; possible response options ranged from 0 to 30 times.

2.3 Data Analysis

To evaluate Aim 1, Chi-squared tests and independent samples *t*-tests were used to compare differences between first-generation and continuing-generation students on key variables at Time 1. Fisher's exact tests were used for subgroup comparisons with $n < 5$ cases for each cell. To evaluate Aim 2, we tested a taxonomy of models using latent growth curve modeling (Grimm, Ram, & Estabrook, 2017). First (null model), we fit an unconditional latent growth model to determine the functional form of the data (e.g., binge drinking) by testing random intercepts, random (versus fixed) linear slopes, and whether a quadratic function (random versus fixed) was needed. In Model 1 we introduced demographic dummy variables, namely race/ethnicity (White race as reference), Hispanic ethnicity, female gender, receipt of financial aid, substance-free floor residence, and parental alcohol problems as predictors of the latent growth factors. In Model 2 we introduced peer descriptive norms, peer injunctive norms, and parent injunctive norms as predictors of the latent growth factors. Finally, in Model 3 we introduced first-generation status (reference: continuing-generation) as a predictor of our latent growth factors.

To evaluate Aim 3, we used multi-group latent growth curve models (see Figure 1 for a conceptual model). Here, we used first-generation student status as our grouping factor and estimated latent growth curves for individuals who identified as first-generation and those who did not. In multi-group models each of the parameters are tested for equality across groups (e.g., means, variances, co-variances, and residual co-variances). To understand the relative influence of peer and parent binge drinking norms, we estimated models that introduced time invariant covariates to the latent growth models. That is, at each time point, we regressed our norm variables (i.e., parent injunctive, peer descriptive and injunctive) onto the contemporaneous observed binge drinking variable. This allowed us to determine the

effect of parent or peer norms on binge drinking, over time, above and beyond the effects of the underlying growth model. First, we introduced time invariant covariates as constrained predictors (e.g., effects are constrained to be equal over time within each group) and tested this model against a model where time invariant covariates were unconstrained. Doing this tested whether parent or peer norms had consistent, stronger, or weaker influences over time on contemporaneous binge drinking. We used a Wald chi-square test of parameter constraints to test both within- and between-group differences.

Because minimal attrition occurred over the course of the study, we assumed data were missing at random, and used a full-information likelihood estimator using Mplus to make use of all available data (version 8; Muthén & Muthén, 1998-2017).

3. Results

3.1 Sample Characteristics

As shown in Table 1, first-generation students were less likely to identify as White/Caucasian or Asian, and more likely to identify as Black/African-American, Hispanic or American Indian/Alaskan Native than continuing-generation students. First-generation students were also more likely to receive financial aid, live on a substance-free dormitory floor, and report having at least one parent with a drinking problem. First-generation students also endorsed lower injunctive norms (peers and parents) than continuing-generation students, although the magnitude of these differences were quite small (Hedges' g [peer injunctive] = 0.25, Hedges' g [parent injunctive] = 0.24).

3.2 Binge Drinking Trajectories

Results from our model building process for binge drinking can be found in Table 2. Briefly, the results indicate a random slope and constrained residual variances fit the data best. Here, we had a significant intercept ($\mu_{intercept} = 2.09$, $SE = 0.08$, $p < 0.00$) and a significant negative slope ($\mu_{slope} = -0.079$, $SE = 0.03$, $p = 0.02$). This indicates an overall decline in binge drinking frequency over time, which can also be gleaned from the mean binge drinking frequencies at each time point in Table 1. In Model 1 (Table 2), when introducing demographic covariates, we found that living on a substance-free floor and receipt of financial aid were significantly associated with lower initial levels of binge drinking. White race and substance-free floor were significantly associated with a less steep slope (e.g., less negative) over the first three semesters. In Model 2, we found that all norms (peer descriptive, peer injunctive, and parental injunctive) had significant and positive associations with binge drinking intercepts (Table 2, Model 2). However, when estimating slopes, only peer descriptive norms were significantly associated with a steeper slope (e.g., more negative) in binge drinking. Finally, in Model 3, we found that first-generation status was not significantly associated with initial levels of binge drinking but was significantly associated with a steeper slope (e.g., more negative) of binge drinking over time. This is also evident in the steeper decrease in mean binge drinking frequency for first-generation students from Time 1 to Time 2 (see Table 1).

3.3 Effects of Norms on Binge Drinking for First-Generation and Continuing-Generation Students

In our final model, all latent factor means, variances, co-variances, and residual covariances were allowed to be freely estimated across groups.

3.3.1 Parental injunctive norms.—Results of our model fitting process indicated a model where the effect of parental injunctive norms was unconstrained (e.g., freely estimated over time) for first-generation college students, but constrained to be equal over time for continuing-generation students. As shown in Table 3 (Model 1), for continuing-generation students, parental injunctive norms were positively associated with binge drinking over time ($b = 0.38$, $p < 0.001$), and these associations were constrained to be the same over time. For first-generation college students, parental injunctive norms were positively associated with binge drinking. However, the strength of these associations decreased significantly over time (Time 1: $b = 0.80$; Time 3: $b = 0.32$; *Wald* $\chi^2 = 6.24$, $df = 1$, $p = 0.01$). Between groups, the association between parental injunctive norms and binge drinking frequency was stronger for first generation students than for continuing generation students at Time 1 ($b = 0.80$ *vs.* $b = 0.38$; *Wald* $\chi^2 = 6.43$, $df = 1$, $p = 0.01$), but not at Time 2 ($b = 0.47$ *vs.* $b = 0.38$; *Wald* $\chi^2 = 0.69$, $df = 1$, $p = 0.41$) or Time 3 ($b = 0.32$ *vs.* $b = 0.38$; *Wald* $\chi^2 = 0.23$, $df = 1$, $p = 0.63$).

3.3.2 Peer descriptive norms.—The best fitting model constrained peer descriptive norms to be equal over time for first-generation college students, and unconstrained (e.g. freely estimated at each time point) for continuing-generation students (see Table 3, Model 2). For first-generation students, peer descriptive norms had positive, stable associations with binge drinking over time ($b = 0.11$, $p = 0.001$). For continuing-generation students, peer descriptive norms showed positive, increasing associations with contemporaneous binge drinking (Time 1: $b = 0.12$; Time 3: $b = 0.26$), with the association at Time 3 being significantly greater than at Time 1 (*Wald* $\chi^2 = 16.5$, $df = 1$, $p < 0.001$). Between groups, no differences were found at Time 1 ($b = 0.12$ *vs.* $b = 0.11$; *Wald* $\chi^2 = 0.14$, $df = 1$, $p < 0.70$) or Time 2 ($b = 0.16$ *vs.* $b = 0.11$; *Wald* $\chi^2 = 1.97$, $df = 1$, $p < 0.16$), but the association between descriptive binge drinking norms and binge drinking frequency was significantly stronger for continuing-generation students at Time 3 ($b = 0.26$ *vs.* $b = 0.11$; *Wald* $\chi^2 = 13.07$, $df = 1$, $p < 0.001$).

3.3.3 Peer injunctive norms.—The best fitting models constrained peer injunctive norms to be equal over time for both first-generation and continuing-generation students (see Table 3, Model 3). Peer injunctive norms had a positive, stable association with binge drinking at each time-point for first-generation students ($b = 0.19$, $p = 0.01$) and continuing-generation students ($b = 0.18$, $p < 0.001$). When using equality constraints, we found that these effects were not significantly different between groups (*Wald* $\chi^2 = 0.058$, $df = 1$, $p = 0.81$), indicating that the stable association between peer injunctive norms and binge drinking frequency was similar for first-generation and continuing-generation students.

4. Discussion

This is the first known study to compare binge drinking trajectories for first-generation students and their continuing-generation peers. Results support our hypotheses for Aim 1, as first-generation students were more likely to identify as underrepresented racial/ethnic groups and to receive financial aid. The proportion of first-generation students who opted to live on a substance-free dormitory floor was twice that of continuing-generation students, suggesting a stronger preference for substance-free living arrangements among first-generation students. As expected, first-generation students perceived more disapproval of binge drinking from their parents, and unexpectedly, perceived more disapproval from peers as well. Perceived peer descriptive norms did not differ between the two groups at Time 1. Finally, a greater proportion of first-generation students reported having one or more parents with a history of alcohol problems.

Results of the latent growth curve models in Aim 2 revealed overall decreases in students' binge drinking frequencies over the first year of college. First-generation status was not uniquely associated with lower binge drinking frequency during the first semester, which may be due to other important variables that were controlled for in the model. Results suggest that substance-free residence and receipt of financial aid may be better indicators of lower risk binge drinking during the first semester than first-generation status, gender, race or ethnicity—although substance-free residence or financial aid do not appear to result in binge drinking declines over time. First-generation status, on the other hand, was associated with greater reductions in binge drinking frequency over time.

These findings suggest there may be something unique about the first-generation student experience that accounts for these binge drinking declines. Aim 3 investigated the possibility that the influence of peer and parental norms during each semester played a role in these group differences. In these analyses, we found that first-generation students differed from continuing-generation students in two ways. First, consistent with our hypothesis, parental injunctive norms were a stronger predictor of binge drinking for first-generation students during the first semester, but this influence weakened over time to eventually match that of continuing-generation students. This suggests that first-generation students may look more to their parents as a guide for their own drinking behavior as they transition into college, a setting in which their parents have limited experience. The finding that parental alcohol problems were more prevalent among first-generation students is relevant here, because it suggests that first-generation students may binge drink less over time as a reaction to previous alcohol problems experienced in the family. Secondly, the influence of peer descriptive norms on continuing-generation students' binge drinking frequency increased over time, but this remained stable for first-generation students. There may be a variety of reasons for this. For one, first-generation students may self-select into peer groups where binge drinking is less prevalent, which may influence their global perceptions of binge drinking frequency among the "typical" same-gendered student (Kenney, Ott, Meisel, & Barnett, 2017). Another possibility is that first-generation students may be less willing to comply with prevailing binge drinking norms, either because they do not identify with the "typical" student (Lindgren et al., 2016), or perhaps because they are more committed to other activities, like part-time employment.

Results from this study can inform University policies and practices aiming to increase support for first-generation college students. College administrators, educators, and health professionals can be aware that first-generation students may be at lower risk of engaging in binge drinking, particularly over subsequent semesters. Policy suggestions include establishing academic and peer-support programming for first-generation students that can encourage social cohesion among those who choose not to engage in risky drinking. Such resources can also provide support for other academic and social challenges that first-generation students often face in post-secondary education. These types of support programs may be particularly important, given that first-generation students tend to report a lower sense of belonging and less utilization of mental health counseling services (Stebleton, Soria, & Huesman, 2014). While the effect of support programs on first-generation students' alcohol use has yet to be examined, more frequent meetings with academic advisors (Swecker, Fifolt, & Searby, 2013), participation in skills learning support programs (Wibrowski, Matthews, & Kitsantas, 2017), and Living-Learning programs (Inkelas, Daver, Vogt, & Leonard, 2007) can improve first-generation students' academic outcomes and ease their transition to college. Even in the context of lower binge drinking risks, it may remain beneficial for faculty and staff to address the role of alcohol in first-generation students' college experience. The role of parents and families cannot be ignored, as parental alcohol problems were more commonly reported, and family expectations regarding alcohol use may be particularly important for first-generation students' during their transition to college. Alcohol interventions that involve parents (see Napper, LaBrie, & Earle, 2016) may be particularly beneficial for preventing alcohol problems among the minority of first-generation students who are at risk.

Of course, this study is not without limitations. For one, this study was conducted at one private University in the northeastern United States, and it is possible that the first-generation students in this study differ from those attending other four-year higher education institutions. Further, the item used to assess first-generation student status was determined by students' self-report, not parental education. It is possible that students may have confused this with first-generation immigrant status. However, students at the present University are likely familiar with the concept of a first-generation college student, since ample programming is provided for first-generation students during orientation and throughout the academic year. Additionally, the reference groups for peer descriptive and peer injunctive norms differed slightly and may not be comparable, and perceived norms measures used a definition of binge drinking for males (> 5 drinks per occasion), not females (≥ 4). Despite these limitations, the current study advances our understanding of risk and protective factors for binge drinking in an understudied group of college students.

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Highlights

- First-generation students had steeper declines in binge drinking frequency
- Parental injunctive norms had a strong positive relationship with drinking initially, but then declined
- Peer descriptive norms had a positive and stable relationship with binge drinking over time

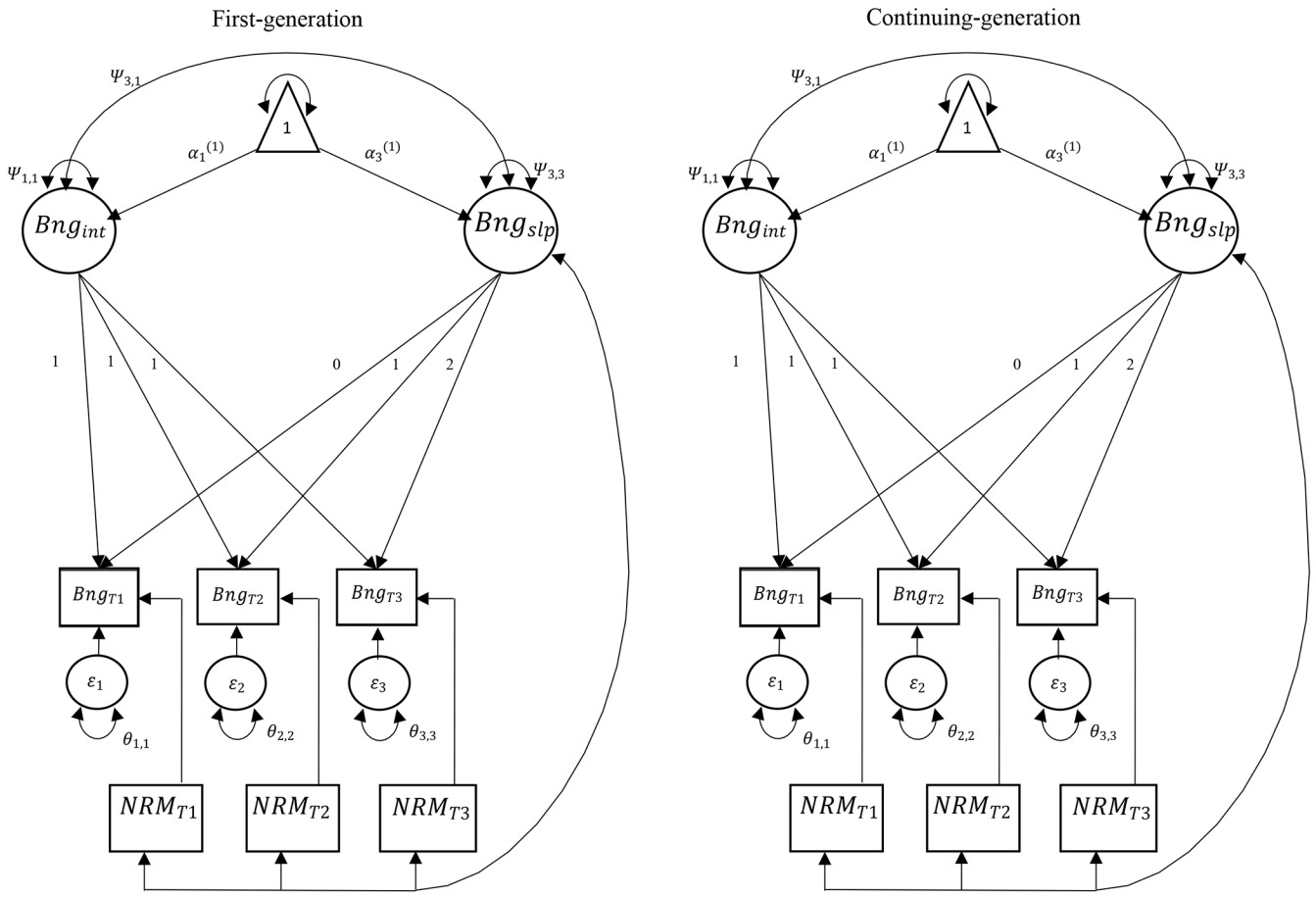

Figure 1.

Above is the conceptual multi-group latent growth model with time varying co-variates used to test Aim 3. The intercept and slope of binge drinking are represented by Bng_{int} and Bng_{slp}, respectively. The time varying co-variates are represented by the observed variables labeled Nrm_x where "x" represents the time-specific effect of norms (parental norms, peer injunctive norms, or peer descriptive norms) on the concurrent time-specific observed binge drinking variable. All parameters across first-generation and continuing education students were tested for equality across groups.

Table 1.

Sample Characteristics and Group Comparisons (N = 1,342).

	Continuing-generation students (n = 1,117)	First-generation students (n = 225)		
Variable	***n* (%) or M (SD)**	***n* (%) or M (SD)**	**χ^2 or *t***	***p***
Male	507 (84.6%)	92 (15.4%)	1.56	0.21
Female	609 (82.1%)	133 (17.9%)		
Race				
White/Caucasian	752 (67.3%)	116 (51.6%)	20.38	< 0.001
Black/African-American	88 (7.9%)	47 (20.9%)	35.04	< 0.001
Asian	338 (30.3%)	52 (23.1%)	4.64	0.03
American Indian/Alaskan Native/Native Hawaiian/Pacific Islander	27 (2.4%)	13 (5.8%)	8.58	0.003
Other	20 (1.8%)	3 (1.3%)	-	0.78
Hispanic Ethnicity	120 (10.8%)	83 (36.9%)	99.57	< 0.001
Receiving Financial Aid	437 (39.1%)	194 (86.2%)	166.77	< 0.001
Greek Intentions	400 (35.8%)	77 (34.2%)	0.21	0.65
Athlete	163 (14.6%)	25 (11.1%)	1.88	0.17
Substance-free Dormitory Floor	132 (11.8%)	50 (22.2%)	17.3	< 0.001
Parental Alcohol Problem(s)	88 (7.9%)	38 (16.9%)	18.94	< 0.001
Peer Norms				
Descriptive Norms (Binge Drinking)	3.39 (2.79)	3.37 (3.02)	.051	0.96
Injunctive Norms (Binge Drinking)	3.73 (1.20)	3.42 (1.37)	3.11	0.002
Parent Norms				
Injunctive Norms (Binge Drinking)	1.96 (1.09)	1.70 (1.03)	3.24	0.001
Binge Drinking Frequency				
Time 1	2.19 (2.96)	1.65 (2.96)	2.49	0.01
Time 2	2.08 (2.72)	1.38 (2.30)	3.93	< 0.001
Time 3	2.06 (2.60)	1.31 (1.93)	4.88	< 0.001

- Fisher's exact test; no test statistic is provided

Note: All statistics reported at Time 1 unless otherwise indicated.

Table 2.

Results of model building process for binge drinking latent growth curve models.

	Model 1	Model 2	Model 3
Variable	***b* (SE)**	***b* (SE)**	***b* (SE)**
Latent Growth parameters			
Intercept	2.30 (0.17) *	0.12 (0.29)	0.13 (0.29)
Slope	−0.24 (0.07) *	0.16 (0.14)	0.18 (0.14)
Variances			
Intercept	5.65 (0.32) *	4.98 (0.29) *	4.98 (0.29) *
Slope	0.25 (0.08) *	0.23 (0.08) *	0.22 (0.08) *
Effect on intercept			
Male Gender	0.51 (0.16) *	0.24 (0.16)	0.24 (0.16)
White Race	0.18 (0.17)	−0.12 (0.17)	−0.12 (0.17)
Hispanic Ethnicity	−0.03 (0.24)	−0.20 (0.23)	−0.20 (0.24)
Substance-free Dorm Floor	−2.02 (0.23) *	−1.47 (0.23) *	−1.47 (0.23) *
Financial Aid	−0.54 (0.16) *	−0.45 (0.15) *	−0.45 (0.16) *
Parental Alcohol Problem	0.47 (0.27)	0.51 (0.26) *	0.51 (0.26) *
Peer Descriptive Norms	--	0.15 (0.03) *	0.15 (0.03) *
Peer Injunctive Norms	--	0.28 (0.07) *	0.28 (0.07) *
Parental Injunctive Norms	--	0.42 (0.08) *	0.42 (0.08) *
First-generation status	--	--	−0.02 (0.22)
Effect on slope			
Male Gender	−0.05 (0.07)	0.00 (0.07)	−0.003 (0.07)
White Race	0.17 (0.08) *	0.21 (0.08) *	0.20 (0.08) *
Hispanic Ethnicity	0.18 (0.11)	0.20 (0.10)	0.25 (0.11) *
Substance-free Dorm Floor	0.26 (0.10) *	0.16 (0.11)	0.17 (0.11)
Financial Aid	0.07 (0.07)	0.05 (0.07)	0.10 (0.08)
Parental Alcohol Problem	0.01 (0.12)	−0.03 (0.12)	−0.01 (0.12)

	Model 1	Model 2	Model 3
Variable	***b* (SE)**	***b* (SE)**	***b* (SE)**
Peer Descriptive Norms	--	−0.03 (0.01)*	−0.03 (0.01)*
Peer Injunctive Norms	--	−0.06 (0.03)	−0.06 (0.03)*
Parental Injunctive Norms	--	−0.05 (0.04)	−0.05 (0.04)
First-generation status	--	--	−0.23 (0.10)*
Fit Statistics			
−2 LL	16,424.38	16,190.44	16,182.30
AIC	16,460.38	16,238.44	16,234.34
BIC	16,553.15	16,361.96	16,368.15
RMSEA	0.02	0.02	0.01
CFI	0.998	0.998	0.998
SRMR	0.008	0.008	0.007
Chi square	12.68(9), $p = 0.18$	15.99(12), $p = 0.19$	16.07(13), $p = 0.25$

Note: −2LL = negative two log likelihood, AIC = Akaike Information Criteria; BIC = Bayesian Information Criteria; RMSEA = Root mean Square Error of Approximation; CFI = Comparative Fit Index; SRMR = Standardized Root Mean Squared Residual

R^2 values for intercept and slopes. Model 1 (Intercept = 0.11; slope = 0.05); Model 2 (Intercept = 0.21; slope = 0.12); Model 3 (Intercept = 0.21; slope = 0.15).

*$p < .05$

Table 3.

Multi-Group Latent Growth Curve Models for Binge Drinking Frequency with Time-Varying Covariates

Variable	Model 1 Parental Injunctive Norms *b (SE)*	Model 2 Peer Descriptive Norms *b (SE)*	Model 3 Peer Injunctive Norms *b (SE)*
First-Generation Students			
Parental Injunctive Norms (Time 1)	0.80 (0.16)*a	--	--
Parental Injunctive Norms (Time 2)	0.47 (0.11)*a	--	--
Parental Injunctive Norms (Time 3)	0.32 (0.10)*a	--	--
Peer Descriptive Norms (Time 1)	--	0.11 (0.03)*	--
Peer Descriptive Norms (Time 2)	--	0.11 (0.03)*	--
Peer Descriptive Norms (Time 3)	--	0.11 (0.03)*	--
Peer Injunctive Norms (Time 1)	--	--	0.19 (0.07)*
Peer Injunctive Norms (Time 2)	--	--	0.19 (0.07)*
Peer Injunctive Norms (Time 3)	--	--	0.19 (0.07)*
Growth parameters			
Intercept	1.02 (0.43)*	2.74 (0.59)*	2.43 (0.63)*
Slope	−0.20 (0.22)	−1.03 (0.27)*	−1.12 (0.27)*
Variance			
Intercept	5.19 (0.70)*	5.59 (0.75)*	5.63 (0.76)*
Slope	0.48 (0.18)*	0.49 (0.19)*	0.47 (0.19)*
Continuing-Generation Students			
Parental Injunctive Norms (Time 1)	0.38 (0.05)*	--	--
Parental Injunctive Norms (Time 2)	0.38 (0.05)*	--	--
Parental Injunctive Norms (Time 3)	0.38 (0.05)*	--	--
Peer Descriptive Norms (Time 1)	--	0.12 (0.02)*a	--
Peer Descriptive Norms (Time 2)	--	0.16 (0.02)*a	--
Peer Descriptive Norms (Time 3)	--	0.26 (0.26)*a	--
Peer Injunctive Norms (Time 1)	--	--	0.18 (0.04)*

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Variable	Model 1 Parental Injunctive Norms *b (SE)*	Model 2 Peer Descriptive Norms *b (SE)*	Model 3 Peer Injunctive Norms *b (SE)*
Peer Injunctive Norms (Time 2)	--	--	0.18 (0.04)*
Peer Injunctive Norms (Time 3)	--	--	0.18 (0.04)*
Growth parameters			
Intercept	1.62 (0.19)*	1.81 (0.20)*	1.56 (0.23)*
Slope	−0.20 (0.08)*	−0.27 (0.09)*	−0.18 (0.08)
Variance			
Intercept	5.31 (0.34)*	5.34 (0.34)*	5.41 (0.34)*
Slope	0.17 (0.09)*	0.14 (0.09)	0.16 (0.09)

Note: All models controlled for male gender, White race, Hispanic ethnicity, financial aid, substance-free dormitory floor residence, and parental alcohol problems.

[a] time varying co-variate model

* $p < .05$

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