HHS Public Access

Author manuscript

Addict Behav. Author manuscript; available in PMC 2020 May 01.

Published in final edited form as:

Addict Behav. 2019 May ; 92: 108–114. doi:10.1016/j.addbeh.2018.12.021.

Transitions in drinking behaviors across the college years: A latent transition analysis

Brittney A. Hultgren, Ph.D.[1], **Rob Turrisi, Ph.D.**[2,3], **Michael J. Cleveland, Ph.D.**[4], **Kimberly A. Mallett, Ph.D.**[2], **Racheal Reavy, Ph.D.**[2], **Mary E. Larimer, Ph.D.**[1], **Irene M. Geisner, Ph.D.**[1], and **Michelle M. Hospital, Ph.D.**[5]

[1]Center for the Study of Health and Risk Behaviors, Department of Psychiatry and Behavioral Sciences, University of Washington, Seattle, WA

[2]Edna Bennett Pierce Prevention Research Center, Pennsylvania State University, University Park, PA

[3]Department of Biobehavioral Health, Pennsylvania State University, University Park, PA

[4]Department of Human Development, Washington State University, Pullman, WA

[5]School of Integrated Science and Humanity, Florida International University, Miami, FL

Abstract

OBJECTIVE: College student alcohol use remains a considerable concern. While many colleges provide universal interventions surrounding matriculation, trends indicate alcohol use increases over the college years. This study utilized a person-centered approach to examine changes in drinking across college and predictors (expectancies, attitudes, norms, and gender) of increases in risky drinking. Understanding transitions in drinking patterns and predictors of risky transitions can help identify risky students, periods of increased risk, and inform prevention efforts.

METHOD: 1429 first-year students were recruited from three universities across the USA. Students were assessed in the fall of each of the four years of college using a wide variety of drinking-related measures.

RESULTS: Latent transition analysis (LTA) identified five classes of students (Non-Drinkers, Weekend Light Drinkers, Weekend Heavy Drinkers, Occasional Heavy Episodic Drinkers, Heavy Drinkers). Heavy-Drinkers were not likely to move out of their status during all four years of college. All psychosocial factors were shown to predict class membership during the first year (e.g., higher positive expectancies were associated with greater likelihood of being in a higher risk class). Increased psychosocial risk factors also predicted transitioning to higher risk drinking classes, mostly for Non-Drinkers. Differences by gender were observed.

Correspondence concerning this article should be addressed to Brittney Hultgren, University of Washington, 1100 45th St NE Suite 300 Seattle, WA 98105 Box: 354944. Hultgren@uw.edu. Telephone: 206-221-2171. Fax: 206-616-1705.

CONCLUSIONS: Results indicate many students maintain or increase risky drinking practices, rather than mature out, suggesting continued need for early prevention. Targeting positive attitudes during the first year may be particularly important for later transitions. Males may benefit more from targeted intervention during the transition between third and fourth years. Keywords: College Students; Alcohol Use; Latent Transition Analyses

Introduction

College student drinking continues to be a major public health concern. Alcohol is associated with numerous consequences and is implicated in over 1,500 college student deaths every year (Hingson et al., 2017). Campus prevention efforts primarily administer universal prevention programs the summer prior to matriculation through the first semester. This timing has both empirical and logistical rationale. The first year of college, with new freedoms and reduced supervision, can provide an environment that increases alcohol use and consequences (Barnett et al., 2014). Logistically, this time includes mandatory events, (e.g., orientation and welcome week) in which incorporating interventions can ideally reach most incoming students.

Despite providing interventions during this early period, research has shown increased risky drinking, such as heavy episodic drinking (HED; 4/5 drinks in two hours females/males; NIAAA, 2000), over the college years (e.g., Patrick & Schulenberg, 2011). While many students will 'mature out' of risky drinking practices (Schulenberg et al., 2017; Dawson et al., 2004), this will not occur for everyone. Half of students who have alcohol use disorder (AUD) at age 19 will also qualify for AUD at age 23 (Rohde et al., 2001). Many colleges provide additional intervention to students mandated from alcohol-related infractions. These programs have been effective in reducing alcohol use and consequences (Carey et al., 2016; Larimer & Cronce, 2007), but only reach a small portion of students that could benefit. More research is needed on identifying students who may continue risky drinking and ascertaining additional high-risk transition periods that interventions may target.

Studies examining trajectories of drinking across the first year of college and in broader samples of adolescents transitioning to adulthood typically report several prototypes of changes in drinking (e.g., Ashenhusrt, et al., 2015; Feldman, Masyn, & Conger, 2009). Drinking trajectories reported in these studies are similar and include some or all of the following: 1) *abstainers/light drinkers* – consistently do not drink or drink very little, 2) *stable moderate drinkers* – report consistently moderate levels of drinking, 3) *stable increasers drinkers* – report increasing levels of drinking, 4) *chronic heavy drinkers*, 5) *decreasers* – first report higher, then reduced levels of drinking, 6) *fling* – report a short period of increased drinking, and 7) *late onset drinkers* (Tucker, Orlando & Ellickson, 2003; Brown et al, 2007; Reich et al, 2015; Patrick et al; 2016). While these studies examined differential courses of initiation, continuation, and escalation of drinking, they are not without limitations. These studies tend to result in similar prototypes regardless of baseline age or duration of study (Sher, Jackson & Steinley, 2011). Further, these analyses allow for examination of change in only one drinking variable at a time (e.g., binge drinking; typical weekly alcohol use) when these tend to occur in tandem.

In recent years, *person-centered* approaches [e.g., latent transition analysis (LTA)] have examined drinking subgroups and transitions between these subgroups (Cleveland et al., 2012; Turrisi et al., 2013). Person-centered methodology allows for several indicators, such as frequency and intensity of drinking, to be assessed simultaneously to distinguish distinct classes (Lanza, Patrick & Maggs, 2010). Person-centered approaches do not seek to replace or dispute research utilizing trajectories, but instead provide perspectives on how different drinking outcomes occur together among individuals. Past studies have identified four drinking classes within first and second year students: *Non-Drinkers*, *Weekend Light Drinkers*–drink on weekends and are not likely to have blood alcohol content (BAC) ≥ .08 or engage in HED; *Weekend Heavy Episodic Drinkers* – drink on weekends, are likely to engage HED, and have a BAC ≥ .08 or higher; and *Heavy-Drinkers* – likely to endorse drinking on weekdays and weekends, engage in HED, and have a BAC ≥ .08 (Cleveland et al., 2012; Turrisi et al., 2013). Research has yet to examine these drinking classes across the four years of college or transitions between classes from year to year.

The first aim of this study was to build on past research and assess how student drinking changes over the four years of college using LTA. LTA estimated the percentage of students likely to be in each drinking class and the likelihood of changing classes (either of increasing or decreasing risk) each year. We hypothesized that drinking classes will be similar to those reported among first and second year students. We also assessed whether there were pivotal time points of change (i.e., more students moving into riskier drinking classes). The second aim examined predictors of transitions to riskier drinking classes. Positive expectancies, attitudes towards alcohol, and peer descriptive norms have consistently shown associations with heavy drinking in college students (Borsari & Carey, 2001; Nicholi et al., 2010), therefore we hypothesized higher reports on these variables would be associated with increased odds of transitioning to riskier classes. These psychosocial factors have also been shown to be alterable in interventions efficacious at reducing drinking (Larimer & Cronce, 2007). We additionally will explore differences in the proportions of males and females in each drinking class and transitions into riskier classes. Identifying transitions in drinking patterns and predictors of these transitions can help identify risky students, periods of increased risk, and inform prevention efforts.

Method

Participants and Procedure

First-year students enrolled in three large public universities in the United States (N = 5,256) were randomly selected from registrars' lists during the fall of their first year (T1) and sent invitation letters and e-mails with a survey URL and Personal Identification Number (PIN). Letters were sent and emailed to continuing participants during the fall semesters of their second (T2), third (T3), and fourth (T4) years. The universities' local institutional review boards approved all study procedures. Students received $30–35 per assessment.

The parent study aimed to assess reports of both parent and student alcohol communication across college and thus students were deemed eligible for the entirety of the study if at least one parent/guardian also completed baseline. A total of 2,320 students completed baseline and 1429 students (61.6%) were eligible. Baseline demographics of the sample are in Table

1. Compared to the enrolled first-year student populations, the current sample was slightly more female (59.3% vs 51.6%; χ^2 (1, N = 37,096) = 32.66; p < .001), had a smaller percentage of White Hispanic (16.87% vs 23.63%), and a larger percentage of students identifying as White, Non-Hispanic (62.35% vs 51.42%; χ^2 (2, N = 33,481) = 67.96; p < .001).

At T2, 1292 students completed assessments (90.4% retention); 1224 completed T3 (94.7% retention from T2); 1204 completed T4 (98.4% retention from T3). Fewer males than females completed T4 (χ^2 (1, N = 1429) = 19.05; p < .001). No racial differences were found due to attrition at T4 (χ^2 (4, N = 1422) = 4.42; p = 0.35). T-tests assessed differences in drinking between those who were lost to attrition and participants who completed T4 with males and females assessed separately. No differences were found within males. Females who did not complete T4 reported more weekly drinks at T1 (mean difference = 1.92; t(116) = 2.26; p = 0.03) but did not differ on peak BAC or HED (all t's < 1.65).

Measures

Drinking Measures.—Drinking measures were collected at all assessments and used to create six dichotomous drinking indicators (see Table 2). The Daily Drinking Questionnaire (DDQ; Collins et al., 1985) assessed the number of drinks students consumed each day of a typical week within the past three months. The Quantity/Frequency/Peak questionnaire (QFP; Dimeff et al., 1999), assessed the maximum number of drinks consumed on an occasion within the past month and the number of hours spent drinking on that occasion. From this, *peak blood alcohol content* (peak BAC) was calculated following established guidelines (Dimeff et al., 1999). To assess HED, students reported how often in the past two weeks they consumed four or more drinks if female, or five or more drinks if male, in a two-hour period (NIAAA, 2000).

Predictors of Drinking Class Transitions.—All predictors were assessed at T1 and were adjusted for outliers by adjusting values above and below 3.29 standard deviations from the mean (Tabachnick & Fidell, 1996).

Positive expectancies of alcohol.: Using a five-point scale ranging from −2 (strongly disagree) to +2 (strongly agree), students reported their level of agreement on eleven positive outcomes of alcohol (i.e., "*Drinking helps me enjoy a party*"; Sher et al., 1996). Items were summed for a composite score (α = 0.94).

Positive attitudes toward alcohol.: Three questions assessed students' attitudes toward drinking (Turrisi, 1999; Turrisi et al., 2010). Students rated how much they agreed (−2, strongly disagree, to +2, strongly agree) they would feel favorable going to a party and 1) *not drinking*, 2) *having a few drinks*, and 3) *getting drunk*. The first item was reverse scored and items were summed for an index of student attitudes toward drinking (α = 0.76).

Peer descriptive norms.: Using the Drinking Norms Rating Form (DNRF; Baer et al., 1991), students estimated how many drinks their closest friends drank on each day of a typical week in the past three months. Items were summed for a total number of drinks in a typical week.

Data Analyses Plan

Aim 1: Assess drinking classes across the four years of college.—LTA was conducted using PROC LTA in SAS (Lanza et al., 2011). PROC LTA uses full information maximum likelihood (FIML) to address missing data; thus, the entire sample was included to identify latent drinking statuses and transitions (n = 1429). To determine the optimal number of latent drinking classes, we followed guidelines by Collins and Lanza (2013), using relative fit indices (Akaike's information criterion, AIC; Bayesian information criterion, BIC), model parsimony, and interpretation. Model identification was confirmed by examination of models using multiple starting values.

The LTA model has three sets of parameters. Rho parameters (ρ) indicate the probability of a positive, or "yes", response to each indicator; for example, the probability of one drinking class to have a "yes" response of having a peak BAC ≥ .08. Rho parameters are used to interpret differences between each latent status (i.e., drinking class). Delta parameters (δ) supply information about the size each drinking class by providing the probable portion in each drinking class for each year. Lastly, tau parameters (τ) indicate the probability of transitioning from one latent status at time t to another latent status at the following assessment ($t+1$). The tau parameters provide information about whether students are likely to stay in a drinking class or move to a different drinking class. We have three sets of tau parameters; T1–T2, T2–T3, and T3–T4. The rho parameters will assess the question, "*What are the different types of student drinkers?*" the delta parameters assess, "*What are the proportions of students in each class?*" and tau parameters assess, "*How are the students changing between each year?*"

Aim 2: Examine predictors of transitions into increased riskier drinking.—Associations between predictors and both initial drinking class membership (T1) and transitions into riskier drinking classes from T1–T2, T2–T3, and T3–T4 were assessed. First, the three psychosocial variables were standardized. Next, psychosocial variables and gender were added separately as covariates of T1 drinking class membership probabilities (i.e., δ parameters). The likelihood ratio test (LRT) statistic was used to compare the fit of models with and without each covariate. Multinomial logistic regression was used to assess how each covariate predicted T1 membership, relative to a reference class, by providing logit coefficients and odds ratios (ORs). Next, we examined the effect of each predictor on the transitions to riskier drinking classes while controlling for the effect of the variable on T1 class membership. Binary logistic regression was conducted to provide ORs of transitioning into riskier drinking classes.

Results

Drinking Classes

Fit indices and interpretability indicated five latent drinking classes best described the data (Table 3). Comparisons of model fit indices and interpretation of drinking classes deemed that item probabilities (ρ parameters) within each drinking class should be equal across the four years. This indicated that drinking classes were conceptually similar each year and subsequent analyses constrained item probabilities across time.

Results from the five-class solution are presented in Table 4. Four of the drinking classes were consistent with past literature: *Non-Drinkers* were likely to not report any of the alcohol use indicators, *Weekend Light Drinkers* (WLD) were likely to only drink on weekends and were less likely to report a peak BAC ≥ .08 or HED, *Weekend Heavy Episodic Drinkers* (WHED) only drank on the weekends but were also likely to engage in HED and have a peak BAC ≥ .08, and *Heavy-Drinkers* were likely to endorse all alcohol indicators. An additional fifth drinking class was identified. This group was *not* likely to report *typically* drinking on any day of the week in the past three months, but was likely to have engaged in HED and have had a BAC ≥ .08. We identified this class as *Occasional Heavy Episodic Drinkers* (OHED). While OHED was considerably smaller than the other drinking classes, it was also identified in the four-class solution and therefore was considered both stable and meaningful.

Transitions across the Four Years of College

Estimated class proportions (δ's) and transition probabilities (τ's) are presented in Table 4. Bolded numbers on the diagonals of the transition parameters are the probability of students staying in a drinking class. Non-Drinkers were most likely to stay Non-Drinkers; however, this probability decreased each year. When Non-Drinkers transitioned to another drinking class, they were most likely to transition to WLDs. WLDs were most likely to stay WLDs, and this probability increased each year. If WLDs transitioned, they were most likely to move to Non-Drinkers or WHEDs between T1–T2 and T2–T3 and to WHEDs or Heavy-Drinker between T3–T4. OHEDs had the most mobility and were not likely to stay OHEDs. With a few exceptions, the probability of OHEDs transitioning to any other drinking class was approximately equal. WHEDs had the highest probability of staying WHEDs, although the probability decreased each year. WHEDs who transitioned were most likely to move to Heavy-Drinkers. Heavy-Drinkers had the highest stability, indicating once students are in this drinking class they are not likely to move out of it during college.

Predictors of T1 Drinking Class

All psychosocial variables and gender were associated with T1 class membership. Higher reports of positive expectancies were associated with increased odds of membership in WLDs (OR = 2.68), OHEDs (OR = 3.94), WHEDs (OR = 6.82) and Heavy-Drinkers (OR = 14.18) compared to Non-Drinkers (LTR = 702.06, $p < .001$). Positive attitudes toward alcohol were associated with increased odds of being in other drinking classes compared to Non-Drinkers (LRT = 1167.68; $p < .001$; WLDs: OR = 5.79; OHEDs: OR = 25.45; WHEDs: OR = 33.29; Heavy-Drinkers: OR = 109.79). Similarly, higher reports of peer descriptive norms were associated with membership in WLD (OR = 4.44), OHED (OR = 2.09), WHED (OR = 4.43) and Heavy-Drinker classes (OR = 7.16) compared to the Non-Drinkers (LRT = 535.18; $p < .001$). Being female had an increased association with membership in WLD (OR = 1.55) and OHED (OR = 1.33) compared to Non-Drinkers, and being male had an increased association with membership in Heavy-Drinkers (OR = 0.71; LRT = 16.12; $p < .01$)

Predictors of Transitioning into Higher Risk Drinking Classes

We assessed how each predictor was associated with transitioning to riskier drinking classes (e.g., WHEDs transitioning to Heavy-Drinkers). Significant ORs are in Table 5.

Positive expectancies.—Higher reports of positive expectancies were associated with increased odds of Non-Drinkers transitioning to all other drinking classes at T2, T3, and T4, with the exception of transitioning to OHEDs from T1–T2 and T3–T4.

Positive attitudes.—Higher reports of positive attitudes were associated with increased odds of Non-Drinkers transitioning into WLDs, WHEDs, or Heavy-Drinkers at T2, all other drinking classes at T3, and WLDs at T4. Further, positive attitudes were associated with increased odds of WLDs transitioning to WHEDs or Heavy-Drinkers from T3–T4.

Peer descriptive norms.—For Non-Drinkers, higher reports of peer descriptive norms were associated with increased odds of transitioning to WHEDs in all years, and transitioning to Heavy-Drinkers between T3 and T4.

Gender.—Non-Drinkers were more likely to transition to WLDs, OHEDs, WHEDs, or Heavy-Drinkers from T1–T2 and to transition to WLDs from T3–T4 if they were female. Conversely, Non-Drinkers were more likely to transition to OHEDs from T3–T4 if they were male. OHEDs were more likely to transition to Heavy-Drinkers at T3 and T4 and WHEDs were more likely to transition to Heavy-Drinkers at T3 if they were male.

Discussion

Using a sample of three college campuses with data across four years of college, the current study replicated four drinking classes (i.e., Non-Drinkers, Weekend Light Drinkers, Weekend Heavy Episodic Drinkers, and Heavy-Drinkers; Cleveland et al., 2012; Turrisi et al., 2013) with the addition of a new class: Occasional Heavy Episodic Drinkers (OHED). OHEDs typically did not drink, but engaged in HED and had a BAC ≥ .08 at least occasionally. This class was the smallest (1.5 – 3.7% of students each year), and may not have been found previously due to lower sample sizes or slight differences in measurement (e.g., measuring typical weekly drinks in the past three months versus past month). While the OHED class was small, if replicated among the 20 million college students in the United States (National Center for Education Statistics, 2018), this could represent ~300,000 to 740,000 students. OHEDs may only be drinking on specific occasions when drinking is culturally normative and alcohol is more available, such as Halloween or home football games (Neighbors et al., 2011). OHEDs may be experimental drinkers, which could explain why they are likely to transition to a different drinking class and why percentages are reduced in the fourth year of college when many students have more stable access to alcohol due to turning 21. These individuals may be at higher risk for severe consequences, because when they drink, they drink in excess. Future research should assess risk for consequences among OHEDs and whether interventions that target high-risk drinking events could effectively reduce their drinking. Universal interventions should consider incorporating material addressing occasional HED and its risks. Some students may misinterpret the risk of occasional HED if they typically do not drink. Research contradicts this, showing on

nights when students consume more than their average they had an increased likelihood of experiencing sexual consequences (Neal & Fromme, 2007; Scaglione et al., 2014).

Utilizing LTA, we assessed transitions in drinking across the four years of college. Students in higher risk classes were likely to stay in high-risk drinking classes, especially Heavy-Drinkers. This indicates: 1) once students reach Heavy-Drinker status they are unlikely to move out of it during college, and 2) many high-risk drinkers established these practices before or during their first year of college. This suggests the continued need for early prevention. Future research is needed to examine these drinking classes post-college, the proportion of students who continue to engage in risky drinking versus transition into less-risky classes, and how transitions into adult roles (e.g., full-time work, marriage, parenthood) affect these drinking class transitions. Overall, students were more likely to move into riskier drinking, rather than less-risky drinking, classes during college, especially between years three and four. This may be partly due to students turning 21 and may be an important time for additional prevention efforts. Preventions focused solely on 21st birthdays have reduced drinking and harm on students' 21st birthdays (Neighbors et al., 2009, 2012). Additional research is needed to determine if this targeted prevention effort can have lasting effects and reduce risky transitions between the third and fourth year.

Importantly, a small proportion of students moved to less-risky classes, and many students who were Non-Drinkers or WLDs at T1 remained in these lower-risk classes during college. There may be several protective factors that influenced membership in lower-risk drinking classes including parent involvement, academic goals, religiosity, and high levels of self-regulation (Borsari, Murphy & Barnett, 2007; Quinn & Fromme, 2010). One study showed students who received a parent-based intervention were less likely to transition into the Heavy Drinker class from the first to the second year of college (Turrisi et al., 2013). Future research should continue to examine associations between these factors and the likelihood of being and staying in lower-risk drinking classes.

The second aim assessed predictors of transitions into riskier drinking classes. Results indicate that higher positive alcohol expectancies, positive attitudes toward alcohol, and perceived drinking norms were associated with risky transitions; however, these were mostly for Non-Drinkers transitioning into other drinking classes. Positive attitudes were also associated with WLDs transitioning to WHEDs and Heavy-Drinkers between years three and four. These variables may be most pertinent to students who come into college as Non-Drinkers and may be helpful in determining who will transition into risky drinkers. For Non-Drinkers, these variables may be more stable, whereas there may be more variation year-to-year in students who drink. This suggests continued intervention efforts throughout college are important for students who initiate drinking prior to matriculation. Future studies should examine how these constructs change across college and how those changes impact transitions.

Gender findings suggest optimal timing of interventions may differ for males and females. Females were more likely to transition from Non-Drinkers to all of the other drinking classes from year one to two, which indicates the first year of college is a pivotal time for females that start college as Non-Drinkers. This is consistent with research showing the first

semester is associated with increased risk for females to experience severe alcohol-related consequences (Kimble et al., 2008; Scaglione et al., 2014). Results indicate males are more likely to transition to Heavy-Drinkers in year three or four, suggesting males differentiate in risk in the last two years of college; future research should consider development of targeted prevention for males during these years.

Limitations and Future Directions

The current study was not without limitations. Findings may not generalize to all college campuses; however, the current sample is from three U.S. universities that varied in geography and diversity. Students were only eligible if they had a parent/guardian participate and findings should be replicated without this requirement. Self-report was used to measure drinking practices. Research suggests individuals are fairly accurate in estimating their drinking (Kypri et al., 2016), but using diary data may reduce recall bias.

The current study suggests alcohol interventions in college students should seek to have two objectives: 1) prevent students from moving to riskier classes, and 2) move students from riskier drinking classes to less-risky drinking classes. Lastly, additional constructs, including self-regulation, protective behavioral strategies, and parental relationships, should be assessed as predictors of drinking class membership and transitions.

Acknowledgments

This work was supported by funding from NIAAA R01 AA012529.

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Highlights

- Latent transition analysis (LTA) identified 5 classes of students: Non-Drinkers, Weekend Light Drinkers, Weekend Heavy Drinkers, Occasional Heavy Episodic Drinkers, Heavy Drinkers
- All drinker classes, except the Occasional Heavy Episodic Drinkers had a moderate to high likelihood of staying in the same drinker class from one year to the next, with Heavy Drinkers have the highest likelihood of staying Heavy Drinkers.
- The transition from 3rd to 4th year of college may be a transitional period into increasing risky drinking, especially for males.
- Drinking attitudes, expectancies and norms assessed in the 1st year of college were associated with drinking class transitions, mostly for Non-Drinkers transitioning into other drinking classes.

Table 1.

Time 1 demographics

Variable	N	%
Sex		
Male	581	40.7%
Female	848	59.3%
Race		
White	1060	74.2%
Asian	159	11.1%
African American	67	4.7%
Multi-racial	73	5.1%
Other	63	4.4%
No Response	7	0.5%
Ethnicity		
Hispanic	245	17.1%
Non-Hispanic	1177	82.4%
No Response	7	0.5%
Variable	***Mean (SD)***	
Age	18.21 (0.41)	

Table 2.

Percentages reporting alcohol use behaviors at all four assessments

Indicator	T1	T2	T3	T4
Typically Drink in the Past 3 Months	51.1%	56.0%	65.3%	81.3%
Weekday (Sun-Wed) Drinking	8.7%	11.8%	19.2%	31.8%
Thursday Drinking	18.9%	21.5%	28.6%	36.9%
Weekend (Fri, Sat) Drinking	49.6%	54.9%	64.4%	79.9%
Peak BAC of ≥ 0.08	45.7%	40.1%	45.7%	49.0%
HED in the Past Month	38.1%	43.1%	49.8%	54.6%

Note: T1 = 1st year; *T2* = 2nd year, *T3* = 3rd year, *T4* = 4th year; *HED* = Heavy Episodic Drinking

Table 3.

Model Fit Statistics for LTA Models With 2 to 6 Latent Classes

Number of Latent Classes	*-LL*	G^2	*df*	AIC	BIC
2	−11758.58	8399.98	16777196	8437.98	8538.01
3	−10511.14	5905.07	16777177	5981.07	6181.13
4	−10330.91	5544.64	16777152	5670.64	6002.32
5	**−9827.50**	**4537.82**	**16777121**	**4725.82**	**5220.70**
6	−9971.04	4824.89	16777084	5086.89	5776.57

Note: Bold font indicates the selected Model. *LL* = log likelihood; *df* = degrees of freedom; AIC = Akaike's Information Criterion; BIC = Bayesian Information Criteria

Table 4.

Item-Response Probabilities, Class Proportion, and Transition Probabilities for Selected LTA Model

	Latent Class				
	Non-Drinker	**WLD**	**OHED**	**WHED**	**Heavy-Drinker**
Item Response Probabilities					
Typically Drink in the Past 3 Months	0.00	1.00	0.00	1.00	1.00
Weekday (Sun-Wed) Drinking	0.00	0.16	0.00	0.00	0.67
Thursday Drinking	0.00	0.13	0.00	0.29	0.81
Weekend (Fri, Sat) Drinking	0.00	0.98	0.00	1.00	0.96
Peak BAC of ≥ 0.08	0.00	0.13	0.73	0.86	0.89
HED in the Past Month	0.00	0.15	0.80	0.93	0.96
Proportion of Statuses at:					
Time 1 (Fall 1st Year of College)	45.9%	15.2%	3.2%	23.7%	12.0%
Time 2 (Fall 2nd Year of College)	39.8%	15.1%	3.3%	25.5%	16.4%
Time 3 (Fall 3rd Year of College)	30.9%	18.9%	3.7%	21.7%	24.7%
Time 4 (Fall of 4th Year of College)	17.1%	29.2%	1.5%	17.4%	34.8%
Transitions from Time 1 (rows) to Time 2 (columns):					
Non-Drinker	**0.75**	0.13	0.03	0.07	0.02
Weekend Light Drinker	0.19	**0.45**	0.06	0.26	0.05
Occasional Heavy Episodic Drinker	0.26	0.11	**0.11**	0.20	0.32
Weekend Heavy Episodic Drinker	0.06	0.05	0.02	**0.73**	0.15
Heavy-Drinker	0.02	0.06	0.02	0.04	**0.87**
Transitions from Time 2 (rows) to Time 3 (columns):					
Non-Drinker	**0.69**	0.19	0.04	0.05	0.03
Weekend Light Drinker	0.14	**0.52**	0.02	0.20	0.13
Occasional Heavy Episodic Drinker	0.20	0.24	**0.11**	0.17	0.23
Weekend Heavy Episodic Drinker	0.02	0.11	0.03	**0.60**	0.24
Heavy-Drinker	0.02	0.00	0.03	0.05	**0.90**
Transitions from Time 3 (rows) to Time 4 (columns):					
Non-Drinker	**0.49**	0.41	0.01	0.05	0.04
Weekend Light Drinker	0.07	**0.64**	0.03	0.11	0.15

	Latent Class				
	Non-Drinker	**WLD**	**OHED**	**WHED**	**Heavy-Drinker**
Occasional Heavy Episodic Drinker	0.13	0.22	**0.10**	0.31	0.25
Weekend Heavy Episodic Drinker	0.00	0.05	0.01	**0.56**	0.38
Heavy-Drinker	0.01	0.10	0.01	0.02	**0.87**

Table 5.

Odds Ratios of the Effects of Predictors on Transitioning to Riskier Drinking Classes Across College

Positive Expectancies														
	T2 Drinking Class					**T3 Drinking Class**					**T4 Drinking Class**			
T1 Drinking Class	WLD	OHED	WHED	Heavy-Drinker	**T2 Drinking Class**	WLD	OHED	WHED	Heavy-Drinker	**T3 Drinking Class**	WLD	OHED	WHED	Heavy-Drinker
Non-Drinker	1.57***	--	1.59**	2.45**	Non-Drinker	1.43***	1.81**	1.71**	2.19**	Non-Drinker	1.24*	--	2.94*	3.94*
WLD		--	--	--	WLD		--	--	--	WLD		--	--	--
OHED			--	--	OHED			--	--	OHED			--	--
WHED				--	WHED				--	WHED				--
Positive Attitudes														
Non-Drinker	2.53***	--	3.11***	4.19***	Non-Drinker	1.79***	2.52***	2.52***	2.27**	Non-Drinker	1.37**	--	--	--
WLD		--	--	--	WLD		--	--	--	WLD		--	2.02*	1.84*
OHED			--	--	OHED			--	--	OHED			--	--
WHED				--	WHED				--	WHED				--
Peer Descriptive Norms														
Non-Drinker	--	--	1.43**	--	Non-Drinker	--	--	1.36*	--	Non-Drinker	--	--	1.48*	1.50*
WLD		--	--	--	WLD		--	--	--	WLD		--	--	--
OHED			--	--	OHED			--	--	OHED			--	--
WHED				--	WHED				--	WHED				--
Gender														
Non-Drinker	1.82*	1.98**	1.70**	2.56**	Non-Drinker	--	--	--	--	Non-Drinker	1.59*	0.004*	--	--
WLD		--	--	--	WLD		--	--	0.30*	WLD		--	--	--
OHED			--	--	OHED			--	0.19*	OHED			--	0.17*
WHED				--	WHED				--	WHED				--

Note:

* $p < .05$;

** $p < .01$;

*** $p < .001$

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Note: Only significant odds ratios are provided.

Note: Gender – Males = 0, Females = 1.