Moving Beyond Drinking to Have a Good Time: a Person-Centered Approach to Identifying Reason Typologies in Legal-Aged College Student Drinkers

Elizabeth H. Weybright[1] · Brittany R. Cooper[1] · Jonathon Beckmeyer[2] ·
Matthew F. Bumpus[1] · Laura G. Hill[1] · Jon Agley[3]

Abstract Alcohol use, reasons for use, and consequences of use continue to be a major concern in college student populations. This is especially true for students of legal drinking age who may experience different reasons for and greater negative consequences of alcohol use than students under 21 years old. Although multiple studies have used person-centered approaches to understand motivations for and ultimately prevent alcohol use, few have identified multiple typologies of reasons for alcohol use. The current study used latent class analysis to identify homogeneous subtypes of reasons for alcohol use and how classification was associated with alcohol-related consequences in college students aged 21 years old and older ($N = 2300$) from the 2013 Indiana College Substance Use Survey. Four profiles of reasons for alcohol use emerged across males and females: social drinkers, feel good drinkers, relaxed escaping drinkers, and emotion coping drinkers. Although the likelihood of consequences differed across gender, the emotion coping drinkers were more likely to experience all negative consequences, suggesting that it was a high-risk class. In general, this pattern of risk continued with the feel good drinkers and female relaxed escaping drinkers. These results can help optimize college substance use prevention and intervention efforts to (1) identify and understand characteristics of high- and low-risk student drinkers and (2) tailor the content of interventions to those specific profiles resulting in more effective approaches to reducing alcohol use.

Keywords College students · Alcohol use · Consequences · Latent class analysis · Tailored intervention

✉ Elizabeth H. Weybright
elizabeth.weybright@wsu.edu

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

[2] Department of Applied Health Science, Indiana University, Bloomington, IN, USA

[3] Indiana Prevention Resource Center, Indiana University, Bloomington, IN, USA

Introduction

College-attending young adults have an elevated risk for frequent drinking episodes and binge drinking (Slutske et al. 2004), with such patterns peaking around legal drinking age (Cronce and Larimer 2011). Students' risky drinking is concerning given its association with negative alcohol-related consequences, which can have long-lasting effects (Ham and Hope 2003). From 1999–2005, legal-aged students 21–24 years old consistently had the highest rates of binge drinking and driving under the influence as compared to their under 21 and non-college peers, making this group an important target for prevention efforts (Hingson et al. 2009).

In order for prevention initiatives targeting alcohol use to be successful, it is necessary to understand the antecedents of use, and in fact, many intervention approaches target motivations for alcohol use (Cronce and Larimer 2011). Much empirical work has addressed reasons, or motivations, for consuming alcohol. For example, Cooper's (1994) four-factor model of alcohol use motivation has resulted in a clearer understanding of the relationship between motivation, characteristics of drinking, and associated outcomes (LaBrie et al. 2007). While this model has guided much empirical work, Kuntsche, Knibbe, Gmel, and Engels conducted a review of drinking motives and found "no study… that tried to identify homogeneous groups of young people who drink mainly for specific motives" (2005, p. 853). This review suggests that a person-centered approach accounting for

concurrent motivation types is timely and needed. To address this call, the current study used latent class analysis to identify homogeneous subtypes of reasons for alcohol use in legal-aged college students to determine how subtype classification was associated with alcohol-related consequences. Results of this person-centered approach can inform prevention efforts aimed at reducing alcohol use.

College Student Alcohol Use

Alcohol use is pervasive among college-attending young adults. Roughly two thirds of students have consumed alcohol in the past 30 days, and 35 % have engaged in binge drinking in the past 2 weeks (American College Health Association 2014). College students consume alcohol in greater quantities and more frequently than their non-college-attending peers (Slutske et al. 2004). Therefore, the college environment appears to facilitate risky patterns of alcohol use that can result in short- and long-term alcohol-related problems. Indeed, college students' alcohol use is associated with academic problems (e.g., missing class), interpersonal relationships (e.g., conflict), physical and mental well-being (e.g., feeling hungover, unintentional injuries), and health risk behaviors (e.g., unintended or unprotected sexual activity; Delcher et al. 2013; Park and Grant 2005; Park 2004; Turner and Shu 2004). Further, regular heavy alcohol use can have long-term consequences such as alcohol dependency, lower psychological well-being, and poorer romantic relationships during adulthood (Marmorstein et al. 2010; Wiersma and Fischer 2014).

Although college student alcohol use is pervasive, not all drink to the same degree. Demographic factors, such as gender and housing type, are associated with drinking patterns (Borsari et al. Barnett 2007; Fairlie et al. 2012). Additionally, college students' drinking is strongly influenced by their reasons for consuming alcohol (i.e., drinking motivations; Borsari et al. 2007; Kuntsche et al. 2005).

Motivational Models of Alcohol Use

"Motivational models assert that an individual's *reasons* [emphasis added] for engaging in a behavior are important in both the initiation and perpetuation of that behavior" (Read et al. 2003, p. 13). Motivational models hold two assumptions: Individuals drink to achieve expected outcomes, and these expected outcomes are associated with specific patterns of consequences (Cooper 1994). Cooper's (1994; Cooper et al. 1995) four-factor motivational model of adolescent alcohol use places motivations along two dimensions of valence and source, which combine to form four alcohol motives: social (external, positive), coping (internal, negative), enhancement (internal, positive), and conformity

(external, negative). Cooper's model has informed our understanding of how motives contribute to young adult alcohol use patterns and consequences. Negative motivations are most strongly associated with alcohol-related problems, while positive motivations may predict consumption, but their association with problems is less clear (Cooper 1994; Ham and Hope 2003). More recently, Patrick and Schulenberg (2011) found that from ages 18 to 22, increased binge drinking was associated with reasons of getting high and boredom, while binge drinking between ages 22 to 30 was associated with reasons of getting away from problems.

Although the terms "reasons" and "motivations" are often used interchangeably in alcohol motivation research, Kuntsche et al. (2005) distinguished between the two suggesting that reasons reflect a rational decision based on fact whereas motivations are broader representations of conscious and unconscious influences on decision-making processes. Although motivations may be inferred from some reasons (e.g., to have a good time with my friends suggests a social motivation), others are unclear (e.g., to experiment). Consequently, we will refer to these measures as reasons for alcohol use throughout the current study.

Person-Centered Approaches to Address Alcohol Use

One limitation of Cooper's (1994) four-factor model is that the social, coping, enhancement, and conformity factors are assumed to be uni-dimensional. Instead, college students' alcohol use motivations are likely multi-dimensional, as most students drink for more than one reason. Person-centered approaches can capture such multi-dimensionality by identifying subgroups of individuals with unique combinations of reasons. This approach implicitly models heterogeneity rather than average associations between variables across all individuals. Therefore, person-centered approaches offer several benefits and complement knowledge gained from more traditional, variable-based approaches (Lanza and Rhoades 2013).

Although person-centered approaches have been used to understand and prevent young adult alcohol use, Kuntsche et al. (2005) noted that few studies have identified typologies of young adult alcohol reasons. More typically, researchers have identified unique alcohol use profiles (e.g., Varvil-Weld et al. 2013), examined change in use over time (e.g., Auerbach and Collins 2006), or examined if alcohol use profiles moderate the effects of alcohol interventions (e.g., Abar 2012). When alcohol reasons have been the focus, researchers often concentrate on drinking for enhancement and coping motivations (e.g., Kuntsche et al. 2010; Littlefield et al. 2013) or more broadly on social factors such as parenting, rather than reasons for using alcohol.

Only two studies to date have used person-centered approaches to identify multiple drinking reason typologies. Kuntsche et al. (2010) found two major typologies of high-risk drinkers in a representative sample of Swiss 8th–10th graders. *Enhancement drinkers* had significantly higher levels of enhancement and social but lower levels of coping and conformity motivations compared to *coping drinkers*. Enhancement drinkers were more likely to binge drink in the past 30 days and go out more evenings in the last year compared to coping drinkers who were less satisfied with their social relationships and more likely to drink at home. Coffman et al. (2007) used latent class analysis to identify four classes of high school seniors' drinking reasons: *experimenters*, characterized by experimentation and having a good time; *thrill-seekers*, who wanted to have a good time and get high; *multi-reasoners*, who endorsed six motivations, including to get away from problems and because they were angry; and *relaxers*, characterized by a desire to relax and have a good time. Multi-reasoners were more likely than experimenters to initiate early use, get drunk in the past year, and drink before 4 pm. Although these findings informed our study, these same classes may not hold for motivations regarding legal consumption in the college context.

Identifying diverse motivations may be important in illuminating variability in intervention mechanisms (e.g., Cleveland et al. 2012). Person-centered approaches may be particularly promising given that evidence-based interventions such as BASICS (Larimer and Cronce 2002) address student motivations as a key to behavior change. Individuals with different alcohol motivational profiles may have distinct needs regarding the timing or nature of interventions. These approaches can help target subgroups of highest risk.

Current Study

The current study addresses the call for homogeneous risk groups by using latent class analysis, a person-centered approach, to identify subgroups of reasons for alcohol use and their associations with consequences of use and contextual covariates. Contextual covariates provide a greater understanding of how each classes' characteristics are related to known risk factors of alcohol use frequency and intensity. Based on previous work, we hypothesized (1) subtypes of mixed motivations that do not cleanly fall within Cooper's (1994) four-factor model and expect at least one higher risk emotion-coping subgroup, (2) class structure will be the same across gender but associations among profiles and consequences may differ, and (3) the high-risk subgroup will endorse multiple reasons for drinking and will experience negative consequences.

Methods

Procedures

Study data were collected as part of the 2013 Indiana College Substance Use Survey (King and Jun 2013). All 2- and 4-year colleges in Indiana were invited to participate in the survey, and 11 colleges participated (6 public, 5 private; 2 2-year, 9 4-year). The survey was administered online in spring 2013 over a 2-week period selected by each college, with the caveat that data collection must occur either before or at least 1 month after spring break to avoid introducing unmeasured bias (Lee et al. 2006). Schools were given the choice to randomly sample from the student population or survey the entire student body. At a minimum, eligible students received an e-mail invitation including a link to the survey and received a second e-mail at the midpoint of the administration period. Schools were allowed but were not required to offer incentives. Provision of incentives is unlikely to affect the quality of survey responses, and concerns about fairness in unequal distribution of incentives do not significantly affect survey participation (Singer et al. 1999).

Participants

Of 52,374 students invited to participate in the survey, 6660 did so, yielding a 12.7 % response rate. Although this rate is lower than expected for a web-based survey of a college population (Kaplowitz et al. 2004), it falls within one standard deviation of the mean rate from a meta-analysis of 39 web-based surveys that included 11 college-based surveys (Shih and Fan 2008). Participants were removed who reported a lethal pattern of drug use (i.e., using 12 or more substances 40 or more times in past month, $n = 6$), provided inconsistent responses on substance use items (see King and Jun 2013), or failed to report gender ($n = 541$) or age ($n = 1$). Variables of age and gender were necessary for the current study analyses due to the separation of the data by age (i.e., 21 and older) and testing for model invariance by gender. Deletion of a small number of cases is permissible (Graham et al. 2003) when no systematic patterns are observed (Allison 2001). In total, 548 cases (8 %) were eliminated, producing a usable sample of 6112 students.

We began by conducting analyses with the full sample; however, initial analyses failed to indicate measurement invariance across under-age (i.e., under 21 years old) and legal-age samples for the latent class models. In other words, the structure of the latent classes was different, and therefore, we restricted the sample for the current study to those 21 years old or older who reported consumption of alcohol at least once in the past year ($N = 2300$). Most of the final sample was

female (67.0 %, $n = 1543$) and Caucasian (87.3 %, $n = 2009$) with the remaining African-American/Black (3.6 %, $n = 85$), Asian/Pacific Islander (3.0 %, $n = 71$), or other (5.8 %, $n = 135$) and attended public (74 %), 4-year institutions (98 %).

Measures

Alcohol Reasons Items assessing reasons for using alcohol were modeled after Monitoring the Future (Terry-McElrath et al. 2009) and were measured with 15 items asking "Did you drink alcoholic beverages for any of the following reasons in the last 6 months?" (see Table 1). Response options were yes, no, or unsure, and responses of unsure were coded as missing.

Context of Use Covariates Covariates measuring the context of alcohol use included *residence* (i.e., on-campus vs off-campus) and additional alcohol-specific context co-variates. *Binge drinking* was measured as "During the past 30 days, on how many days did you drink five or more alcoholic drinks (for males) or four or more alcoholic drinks (for females) in 2–3 h or less?." *Early age of initiation* was a dichotomous variable representing first using alcohol at 13 years old or younger. *Binge drinking normative perception* was measured by the item "How do you think the other students on campus feel (or would feel) about having five or more alcoholic drinks in one sitting." Individuals were asked to respond using a five-point Likert scale (1 = *strongly approve* and 5 = *strongly disapprove*).

Consequences of Use Covariates Negative consequences of alcohol use included five items asking "Have you experienced any of the following due to your drinking in the last 6 months?" taken from the Core Alcohol and Drug Survey (Presley et al. 1994). Consequences included *felt bad or guilty about your drinking*, *driven a car while under the influence*, *blacked out*, *unwanted sexual attention* (being touched when you do not want to be, forced kissing, etc.), and *risky sexual behavior* (having unprotected sex or sex with someone you just met because you were drinking). Response options ranged from 1 = *never* to 6 = *10+ times*. For the current study, we created dichotomized variables to indicate ever experiencing the consequence (i.e., one or more times) or not.

Analytic Approach

Latent class analysis (LCA) was used to identify homogeneous subgroups with distinct combinations of alcohol use reasons and to examine likelihood of reporting context and consequence of use given membership in these subgroups. Using steps from Collins and Lanza (2010), analyses were

conducted with SAS PROC LCA (Lanza et al. 2007) using Version 9.4. These steps included latent class model selection, testing measurement invariance, and examining associations between covariates and latent class membership.

Models were estimated with one through seven classes. All models accounted for the clustering of students within college. Model fit was determined by fit indices, interpretability, and parsimony. Fit indices included G^2, Akaike information criterion (i.e., AIC), Bozdogan's consistent AIC (i.e., CAIC), Bayesian information criterion (i.e., BIC), adjusted BIC, and entropy. Smaller values, except entropy, indicate a better model fit. LCA results produce parameters for the probability of response for each alcohol reason given the latent class (i.e., item response probabilities) and the probability of membership in each latent class (i.e., class membership probabilities). Item response probabilities are used to interpret and identify descriptive labels for each class.

Once the final model was identified, gender was included in the model as a grouping variable to determine if the latent class structure was the same for males and females, examine differences in the proportions in each reason class, and de-scriptively compare experience of consequences. To do so, a freely estimated model was compared with a model where class structure was constrained to be equal. Model fit was evaluated using differences in G^2 and degrees of freedom as compared to the X^2 distribution using the likelihood-ratio difference test (indicating whether measurement invariance held across gender) as well as relevant fit indices. Covariates were then included in the model to examine associations between alcohol use reason subgroups and contexts and consequences of use. Any odds ratio comparisons of covariates presented across gender are descriptive in nature and not the result of a statistical comparison.

Results

Descriptive Statistics

Gender comparisons of reason endorsement are included in Table 1. For all reasons significantly different by gender, males were more likely to endorse the reason, except for "to experiment." Due to low endorsement (<10 %), six reasons were excluded: I'm "hooked," to seek deeper insights and understanding, to get through the day, to increase the effects of some other drug(s), to decrease the effects of some other drug(s), and to get sleep.

Latent Class Model Selection

A four-class model was determined to best reflect the heterogeneity in drinking reasons (see Table 2). Although the AIC continued to decrease, suggesting more classes were needed,

Table 1 Proportion of reason endorsement for alcohol use by gender and χ^2 difference test

	% of males ($n = 757$)	% of females ($n = 1543$)	X^2
To experiment (to see what it is like)	24.04	31.04	12.15***
Because I am "hooked" (I feel I have to drink)[a]	2.27	1.57	1.38
To relax or relieve tension	59.74	55.02	4.58*
To feel good or get high	59.52	47.42	29.54***
To seek deeper insights and understanding[a]	1.83	4.42	63.98***
To have a good time with my friends	90.20	86.81	5.48*
To fit in with a group I like	18.71	12.66	14.63***
Because of boredom, nothing else to do	27.07	19.79	15.44***
Anger or frustration	13.41	15.08	1.14
To get through the day[a]	4.63	2.86	4.76*
To increase the effects of some other drug(s)[a]	9.15	2.34	53.86***
To decrease (offset) the effects of some other drug(s)[a]	3.06	0.91	14.72***
To get sleep[a]	11.14	5.00	29.20***
Because it tastes good	48.11	47.05	0.22
To get away from problems or troubles	14.00	16.79	2.95

$N = 2300$

[a] Reason not included in LCA analyses due to low frequency of endorsement

*$p = 0.05$, **$p = 0.01$, ***$p = 0.001$

both the CAIC and the BIC pointed to the four-class model, and the adjusted BIC suggested the five-class model. We examined models with four and five classes in more detail; the four-class model was selected because it was more parsimonious and interpretable than five classes.

The final model (see Table 3) consisted of *social drinkers*, *feel good drinkers*, *relaxed escaping drinkers*, and *emotion coping drinkers*. Social drinkers only endorsed drinking to have a good time with friends. The feel good drinkers

endorsed drinking to have a good time with friends, relax or relieve tension, feel good or get high, and because it tastes good. The relaxed escaping drinkers endorsed drinking to have a good time with friends, relax or relieve tension (most frequently endorsed item), feel good or get high, because it tastes good, and to get away from problems or troubles. Escaping was added to the class title to reflect how this class is distinguished from the feel good drinkers. Finally, the emotion coping drinkers endorsed drinking for the most reasons

Table 2 Fit indices for model specification

No. of classes	Log-likelihood	G^2	df	AIC	CAIC	BIC	Adj. BIC	Entropy
1	−11,047.53	2638.40	502	4656.40	2717.07	2708.07	2679.47	1.00
2	−10,167.90	879.15	492	917.15	1045.22	1026.22	965.85	0.70
3	−9984.52	512.38	482	570.38	765.86	736.86	765.86	0.68
4	−9939.86	423.08	472	501.08	763.97	724.97	604.06	0.68
5	−9913.83	371.02	462	469.02	799.31	750.31	594.63	0.65
6	−9894.46	332.27	452	450.27	847.97	788.97	601.51	0.64
7	−9876.78	296.91	442	434.91	900.02	831.02	611.79	0.61
4 with grouping variable	−9879.94	625.55	945	781.55	1307.32	1229.32	981.50	0.67
4 with grouping variable and measurement invariance	−9921.71	709.08	981	793.98	1076.19	1034.19	900.75	0.68

Likelihood ratio difference test: $G^2_{dif}(36)$ 85.53, $p < 0.001$

$N = 2300$

G^2 deviance statistic, *df* degrees of freedom, *AIC* Akaike information criterion, *CAIC* Bozdogan's consistent AIC, *BIC* Bayesian information criterion, *Adj. BIC* adjusted BIC

Table 3 Class membership and item response probabilities for four-class model

	Social drinkers	Feel good drinkers	Relaxed escaping drinkers	Emotion coping drinkers
Class membership probabilities				
Males	0.28	0.49	0.08	0.15
Females	0.41	0.34	0.13	0.12
Item response probabilities				
Experiment	0.31	0.24	0.28	0.36
Relax or relieve tension	0.18	**0.70**	**0.90**	**0.98**
Feel good or get high	0.10	**0.75**	**0.56**	**0.94**
Have a good time with my friends	**0.71**	**0.99**	**0.89**	**0.99**
Fit in with a group I like	0.05	0.15	0.07	0.46
Boredom, nothing else to do	0.03	0.24	0.21	**0.72**
Anger or frustration	0.01	0.00	0.49	**0.70**
It tastes good	0.35	**0.52**	**0.50**	**0.64**
Get away from problems or troubles	0.00	0.00	**0.60**	**0.70**

Item response probabilities ≥0.50 are bolded. Classes are presented in increasing order of total number of reasons

including have a good time with friends, relax or relieve tension, feel good or get high, because it tastes good, and to get away from problems or troubles. Additionally, this class was the only to endorse drinking because of boredom or nothing else to do and because of anger or frustration.

Gender Grouping Variable

Results from likelihood ratio test comparing differences in the G^2 for models with and without measurement invariance imposed were statistically significant, suggesting that the measurement invariance did not hold across gender (see Table 2). However, fit indices including the CAIC, BIC, and adjusted BIC all were lower in the constrained model. Collins and Lanza (2010) suggested that fit indices may be better indications of fit than simply using the G^2 difference test alone, especially when the degrees of freedom are large. The likelihood ratio test suggested that the freely estimated model was a better fit, but the fit indices suggested that the constrained model was a better fit, so we examined the four-class model for males and females separately. We found that the class structure, or pattern of item response probabilities for each class, was essentially the same for males and females. Therefore, because the constrained model is more parsimonious, eases interpretation, and allows within class comparisons, we chose to present and interpret the four-class model with measurement invariance.

Class membership probabilities (see Table 3) range from 0 to 1 and cumulatively sum to 1. For the four classes, the probability of membership for males was the greatest in the feel good drinker class (0.49) followed by the social drinkers (0.28), emotion coping drinkers (0.15), and relaxed escaping

drinkers (0.08). For females, the probability of membership was greatest in the social drinkers (0.41) followed by the feel good drinkers (0.34), relaxed escaping drinkers (0.13), and finally the emotion coping drinkers (0.12).

Context and Consequence Covariates

Covariates were included in the final model separately by gender to ease interpretation. For all covariates, social drinkers served as the reference class as this class endorsed more normative reasons and are at lower risk for alcohol-related problems (Kuntsche et al. 2005).

Context of Use Residence (G^2_{dif} (6) 25.12, $p < 0.001$) reflected whether a student lived on- or off-campus. Males in the feel good (OR = 2.12) and emotion coping (OR = 2.32) classes were more likely than the social drinkers to live off-campus. Females in the relaxed escaping (OR = 2.04) class were more likely than the social drinkers to live off-campus.

Early age of initiation (G^2_{dif} (6) 47.85, $p < 0.001$) identified students who reported first using alcohol at the age of 13 years old or younger. As compared to social drinkers, males and females in the relaxed escaping (OR$_{Male}$ = 7.76; OR$_{Female}$ = 3.76) and emotion coping (OR$_{Male}$ = 5.74; OR$_{Female}$ = 2.87) classes were more likely to have early initiation of alcohol use.

Binge drinking in past month significantly predicted latent class membership (G^2_{dif} (6) 830.40, $p < 0.001$). Compared to the social drinkers, all other classes for both males and females were more likely to report more frequent binge drinking. Specifically, individuals who reported one standard deviation more than the mean number of days binge drinking in the past

month were 3.37 times more likely for males and 2.54 times more likely for females in the emotion coping drinkers relative to the social drinkers. They were also 2.96 times more likely for males and 2.24 times more likely for females to be in the feel good drinkers relative to social drinkers and 2.43 times more likely for males and 1.92 times more likely for females to be in the relaxed escaping drinkers relative to the social drinkers.

Perceptions of student binge drinking as normal (i.e., more approving) also significantly predicted latent class membership (G^2_{dif} (6) 205.94, $p < 0.001$). Compared to the social drinkers, all other classes for males and females, except relaxed escaping, were more likely to indicate that other students would approve of binge drinking. Specifically, individuals who reported one standard deviation lower than the mean on the disapproval scale for student binge drinking (i.e., they were more approving of binge drinking) were 2.29 times more likely for males and 1.67 times more likely for females to be in the emotion coping drinkers relative to the social drinkers. They were also 1.6 times more likely for males and 1.5 times more likely for females to be in the feed good drinkers relative to the social drinkers.

Consequence of Use Results are included in Table 4. Compared to the social drinkers, all other classes were more likely to have felt bad or guilty about their drinking (G^2_{dif} (6) 52.52, $p < 0.001$). Emotion coping drinkers had the greatest odds of feeling guilty ($OR_{Male} = 6.94$), followed by relaxed escaping drinkers ($OR_{Male} = 4.49$; $OR_{Female} = 3.03$) and feel good drinkers ($OR_{Male} = 2.57$; $OR_{Female} = 2.47$). In each class, males had higher odds than females except for the emotion coping class where the odds of feeling guilty was not significant for females. Blacking out significantly predicted class membership (G^2_{dif} (6) 638.65, $p < 0.001$), emotion coping drinkers had the highest odds of blacking out ($OR_{Male} = 39.61$; $OR_{Female} = 22.13$), followed by feel good drinkers ($OR_{Male} = 17.40$; $OR_{Female} = 9.96$) and female relaxed escaping drinkers ($OR_{Female} = 6.15$; $OR_{Male} = ns$).

Driving under the influence of alcohol (G^2_{dif} (6) 277.57, $p < 0.001$) significantly predicted latent class membership. Male and female emotion coping drinkers had the highest odds of having driven under the influence ($OR_{Male} = 25.30$; $OR_{Female} = 43.71$) followed by the feel good drinkers ($OR_{Male} = 7.43$; $OR_{Female} = 11.43$) and then female relaxed escaping drinkers ($OR_{Female} = 9.43$; $OR_{Male} = ns$). In each class, except for the relaxed escaping drinkers where the male odds ratio was not significant, females had higher odds than males.

The final two consequence covariates related to engaging in risky sexual behaviors (G^2_{dif} (6) 606.81, $p < 0.001$) and experiencing unwanted sexual attention (G^2_{dif} (6) 242.02, $p < 0.001$), both of which significantly predicted latent class membership. Males and, even more so, females in the emotion coping drinkers had the highest odds of engaging in risky sexual behaviors ($OR_{Male} = 33.35$; $OR_{Female} = 42.66$) followed by feel good drinkers, where males had higher odds than females ($OR_{Male} = 10.64$; $OR_{Female} = 9.10$). In the relaxed escaping drinkers, only females had significant odds of experiencing the consequence relative to the social drinkers ($OR_{Female} = 5.81$; $OR_{Male} = ns$). Females in all classes had

Table 4 Consequences of use as predictors of membership in latent classes

	Feel good drinkers	Relaxed escaping drinkers	Emotion coping drinkers	Feel good drinkers	Relaxed escaping drinkers	Emotion coping drinkers
Covariate	Males			Females		
Felt bad or guilty						
Beta	0.95	1.50	1.94	0.90	1.11	2.61
Odds ratio	**2.57**	**4.49**	**6.94**	**2.47**	**3.03**	13.62
Blacking out						
Beta	2.86	1.04	3.68	2.30	1.82	3.10
Odds ratio	**17.40**	2.82	**39.61**	**9.96**	**6.15**	**22.13**
Driving under the influence						
Beta	2.01	0.49	3.23	2.44	2.24	3.78
Odds ratio	**7.43**	1.63	**25.30**	**11.43**	**9.43**	**43.71**
Risky sexual behaviors						
Beta	2.36	−2.74	3.51	2.21	1.76	3.75
Odds ratio	**10.64**	0.06	**33.35**	**9.10**	**5.81**	**42.66**
Unwanted sexual attention						
Beta	2.16	1.15	3.31	1.44	1.54	2.75
Odds ratio	8.65	3.14	**27.50**	**4.21**	**4.64**	**15.57**

Reference class is social drinkers. Significant odds ratios at $p < 0.05$ are bolded

greater odds of experiencing unwanted sexual attention; emotion coping drinkers ($OR_{Female} = 15.57$) were highest followed by relaxed escaping drinkers ($OR_{Female} = 4.64$) and feel good drinkers ($OR_{Female} = 4.21$). The only significant finding for male unwanted sexual attention was for the emotion coping drinkers, who had odds higher than the females for this class ($OR_{Male} = 27.50$).

Discussion

In the current study, we used an LCA approach to model the multi-dimensionality of legal-aged college students' reasons for drinking, identifying four classes. Overall, the classes and their associations with drinking contexts and consequences support our hypotheses. First, the classes do not map cleanly to Cooper's (1994) model of drinking motivation. Our classes, with the exception of the social drinkers, all endorsed multiple reasons for use. For example, feel good drinkers endorsed consuming alcohol for social and enhancement (i.e., to feel good or get high) reasons, which in Cooper's framework fall within different factors. Thus, our person-centered approach showed that college students' underlying typologies of alcohol use reasons typically reflect multiple reasons. The use of variable-centered approaches has limited our understanding of how types of reasons group together by obscuring that some combinations may be more harmful than others. Second, the class structure was similar for males and females; however, males were most likely to be feel good drinkers whereas females were most likely to be social drinkers. Additionally, males and females differentially experienced the consequences of their alcohol use. In general, both male and female emotion coping drinkers reported being more likely to experience negative consequences of use.

Both our study and that of Coffman et al. (2007) identified four-class solutions, and class structure held across gender. However, the classes differed. Whereas Coffman identified an experimenters class, the reason of experimentation did not appear in any of our classes. This is consistent with the "experimental, sporadic, and opportunistic" alcohol use common in adolescence (Jackson and Schulenberg 2013, p. 2143) but diminishing in early adulthood. Coffman's relaxers class was similar to our feel good drinkers which included two additional reasons to have a good time and because it tastes good. Results are supported by developmental changes in alcohol use reasons where reasons "to relax" and "because it tastes good" increase between ages 18 and 30 (Patrick et al. 2011). Finally, Coffman's multi-reasoners were most similar to our emotion coping drinkers although our class also included the reason of boredom. Given that boredom typically peaks during adolescence and then decreases (Schulenberg et al. 2012), this reason suggests that emotion coping drinkers

may also generally have difficulty structuring their free time in healthy ways (Weybright et al. 2015).

When reviewing context of use, our emotion coping drinkers and Coffman et al.'s (2007) multi-reasoners were most likely to exhibit risky drinking behaviors (with the exception of early age of initiation where emotion coping drinkers were second highest). This supports prior literature finding those groups endorsing the greatest number of reasons, and those drinking to cope were more likely to exhibit risky drinking behavior (e.g., binge drinking; Kuntsche et al. 2005). Drinking to escape or deal with negative emotions may be indicative of a maladaptive coping strategy, placing individuals at higher risk for experiencing negative consequences (Park and Grant 2005). This may be especially true for males who are more likely to engage in avoidant coping strategies (Nolen-Hoeksema 2004). In the current study, both male and female emotion coping drinkers were at greatest risk of experiencing negative consequences. Male relaxed escaping drinkers were only likely to experience feeling guilty about their drinking, a result potentially due to the low class membership (0.08). Female feel good drinkers had the second highest odds (after emotion coping drinkers) of blacking out, driving under the influence, and engaging in risky sexual behaviors. The feel good drinkers group represented the largest proportion of males and second largest proportion of females while highly endorsing only four reasons (as compared to five and seven in the relaxed escaping and emotion coping drinkers), suggesting that merely totaling the number of reasons may not be an effective approach for identifying female drinkers who are at risk for experiencing negative consequences.

Although this study makes important contributions to our understanding of drinking reason typologies in college students, sampling is a potential limitation as participants self-selected into the study, data were from a single state, and the sample was relatively homogeneous which may bias results and limit generalizability. Strengths include the large sample size and the application of LCA to study drinking motivations in an older group than has previously been explored. In future studies, the latent class structure we describe should be tested with samples from other colleges, diverse samples, and non-college-attending adults in the same age range, for comparison and validation of the model. In addition, these latent classes should also be tested with students who are under 21, as the context of alcohol motivations and use may vary for underage drinkers since they cannot legally drink in public.

Implications for Prevention Science

Given the significant personal, social, and societal consequences associated with young adult substance abuse and misuse (Park and Grant 2005; Turner and Shu 2004), the need

for effective substance use interventions during college is clear. By further illuminating the multiple motivations or reasons that underlie use, the present study opens a window into better understanding why students engage in these potentially harmful behaviors. Specifically, the person-centered nature of the analyses provides important information about the most common profiles of student alcohol use reasons. This information is critical for optimizing college prevention efforts for two reasons: (1) It helps us identify and understand the characteristics of students who are at lower and higher risk for problems, and (2) it provides information that could be used to help tailor the content of interventions to those specific profiles.

Research on the efficacy and effectiveness of substance use interventions for college students has burgeoned over the past decade and a half. To date, meta-analyses confirm that the most effective individual-level interventions use motivational interviewing techniques to provide students with personalized, normative feedback on substance use and related attitudes, motivations, expectancies, and behaviors (e.g., Carey et al. 2007; Larimer and Cronce 2002). Theory and empirical evidence suggest that the key elements to this type of effective, brief intervention are personalized feedback and an emphasis on self-efficacy (e.g., Cronce and Larimer 2011). As such, our findings can be used to enhance personalized feedback related to specific profiles of drinking reasons and associated consequences. Many current interventions include components challenging drinking expectancies and/or motivations, but our findings can expand that discussion in several ways. Social reasons of drinking are nearly universally endorsed in our sample, and if a student reports drinking only for social reasons, they are likely at lower risk for the most dangerous drinking consequences. That being said, as a universal strategy, referring students to alcohol-free activities should be encouraged as an alternative way to reach social goals, an approach effective at reducing binge drinking (Patrick et al. 2010).

Similar to Kuntsche et al. (2010), our findings suggest that higher risk drinkers are likely to endorse enhancement and coping motivations. In their work, Kuntsche and colleagues recommended that interventions targeted at enhancement drinkers should emphasize alcohol-free social activities, modify drinking expectancies, and encourage safer drinking environments. For coping drinkers, the focus should be on life skills training and healthy coping alternatives. These recommendations may also apply to the three classes in the current study endorsing multiple reasons, especially given their increased risk compared to the social drinkers. Unlike Kuntsche et al., however, our results clearly point to emotion coping drinkers as a subgroup of college drinkers particularly prone to alcohol-related consequences. An important next step will be to identify these students and tailor interventions to their specific needs. This approach could draw from the work of Conrod et al. (2013), who have targeted interventions toward high anxiety youth susceptible to drinking as a means of coping.

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