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How Estimation of Drinking Influences Alcohol-Related Consequences Across the First Year of College

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Abstract

Background—The current study examined how well students estimate their *overall drinker type* and the relation between the accuracy of this estimation with alcohol related consequences. The study also explored the association between psychosocial alcohol variables and underestimation or overestimation of drinker type.

Method—College students ($N=1895$) completed questionnaires at baseline (pre-college matriculation) assessing self-reported drinker types (SI), protective and risky drinking behaviors, drinking expectancies, attitudes, and norms. Post-baseline assessment occurred during the fall semester sophomore year and included the number and type of alcohol consequences experienced during the previous year. Students' SIs were coded as accurate, overestimated, or underestimated relative to their empirically derived latent class analytic (LCA) drinker class. The association between drinker type accuracy and consequences and membership in the high-risk Multiple and Repeated Consequence (MRC) group was assessed, as was the relationship between the psychosocial alcohol variables and accuracy.

Results—Eighteen percent of students underestimated and 10% overestimated their drinker type. Students who under- or over-estimated their drinker type reported experiencing more consequences, even after controlling for drinking. Increases in positive alcohol expectancies, protective and risky drinking behaviors and descriptive peer norms were positively associated with underestimation of drinker type. Only protective and risky drinking behaviors were associated with overestimation.

Conclusions—The present study underscores the importance of accurate estimation of drinker type and the risk of experiencing alcohol consequences. Future research and intervention strategies are discussed.

Keywords

College drinking; Drinker types; Latent class analyses; Alcohol-related consequences; Alcohol attitudes and norms

Alcohol consumption continues to be an important concern on college campuses (Johnston et al., 2012; Nelson et al., 2009). One-third of students report engaging in frequent heavy episodic drinking behavior (HED; Johnston et al., 2012) placing them at risk for physical, academic, interpersonal, sexual and legal consequences (Hingson et al., 2009; Wechsler et al., 2000; Wechsler et al., 1999). Together, these reports underscore the importance of

understanding the etiology of constructs related to reducing college student alcohol consequences.

Research has documented a strong association between blood alcohol concentration (BAC) and consequences (Borsari and Carey, 2001; LaBrie et al., 2010; Lee et al., 2010). However, studies reveal that individuals tend to be poor at estimating BAC when consuming alcohol (Grant et al., 2011; Lansky et al., 1978), retrospectively (Carey and Hustad, 2002), and in hypothetical decision-making situations (Jaccard and Turrissi, 1987; Turrissi and Wiersma, 1999). Some of the problems associated with BAC estimation include the unreliability of interpreting physiological cues (e.g., sensations; Schuckit, 1980; Grant et al. 2011), overestimating drink sizes or underestimating alcohol content in unstandardized servings (White et al., 2003), and reliance on precise mathematical calculations regarding body weight, alcohol content, and time of consumption (Turrissi et al., 1993; Turrissi and Jaccard, 1991). BAC estimation is further complicated by research documenting individual differences. For example, underestimation of BAC has been shown to be higher in youth with a family history of alcoholism (Turrissi and Wiersma, 1999), individuals with past convictions of driving while intoxicated (Turrissi and Jaccard, 1991), and with heavy drinking college student party-goers (Mallett et al., 2009a).

In contrast to BAC, less is known about students' ability to accurately identify their own *drinker* type (e.g., a light, social, non-problem, or a heavy drinker; see Jackson, 2008; Miller and Marlatt, 1984; Leonard et al., 2000) and how this relates to alcohol consequences. Although Jackson (2008) observed that college women who drank heavily over short periods of time did not view themselves as heavy drinkers, no published studies have conducted an empirical examination of whether students can accurately estimate drinker type and whether these estimates are associated with alcohol consequences. Thus, the first aim of the present study is to assess whether students can accurately estimate their drinker type. To do so, the current study will compare self-identified drinker types with empirically derived drinker types using latent class analyses (LCA) from Cleveland et al. (2012; see also Turrissi et al., 2012).

The second aim of this study is to examine if estimation of drinker type is associated with experiencing alcohol consequences. Past research has shown that students who underestimate intoxication are more prone to risky drinking (Mallett et al. 2009a; Turrissi and Wiersma, 1999). Based on these findings, it is plausible to hypothesize that students who underestimate *drinker type* (e.g., misperceive themselves as a lighter drinker, when in fact, they drink in ways or amounts which place them at higher risk for experiencing consequences) will experience more consequences. Additionally, the association between overestimation of drinker type and consequences will be explored. Since overestimators identify as heavier drinkers, they may be more likely to have reduced consequences. Conversely, these students may experience more consequences because they *believe* themselves to be riskier drinkers. This hypothesis is consistent with the alcohol expectancy theory, which has shown individuals will act intoxicated when they believe they are drinking alcohol, even when they are not (Smith and Goldman, 1994).

Lastly, the present study will explore the association between psychosocial alcohol variables (positive alcohol expectancies, peer norms, and attitudes) and estimation of drinker type. Research is lacking in identifying how potentially alterable psychosocial variables are associated with estimation of drinker types. We hypothesize that riskier orientations on these constructs (e.g., positive alcohol expectancies and peer normative drinking) will be positively associated with underestimation of drinker type. Again, these predictors will be additionally explored in students who overestimate.

Materials and Methods

Participants

Students ($n = 2907$) at a large northeastern university were invited during the summer before college matriculation. Eligible participants: (a) were enrolled as first-time incoming students, (b) consented to participate, and (c) completed a baseline assessment. Of those invited, 1901 completed the baseline survey, yielding a 65.4% response rate. The response rate is consistent with previous studies using a web-based approach (Larimer et al., 2007; McCabe et al., 2005; Thombs et al., 2005). Six students were dropped due to technical issues with PINs or consenting, resulting in a sample of 1895 students.

Enrolled participants had a mean age of 17.94 years ($SD = .32$), were 52% female, 87% Caucasian, 5% Asian, 3% African American, 5% Hispanic, and 5% multi-racial or other. Twenty-three percent of the sample intended to join a fraternity or sorority. Rates of lifetime drinking (78.9%) were similar to those in the Monitoring the Future study (80.5%; Johnston et al., 2011).

Recruitment Procedure—Participants were randomly selected from the registrar's database of incoming students. Invitation letters explaining the study, procedures, compensation and containing a URL and Personal Identification Number (PIN) for accessing the survey were mailed to potential participants during the summer prior to college matriculation in 2007 (Cohort 1) and 2008 (Cohort 2). Emailed invitations and email and postcard reminders were also sent. Participants received \$30 for the baseline survey and \$35 for the follow-up survey. Follow-up assessments were conducted approximately 15 months post-baseline. As reported in Turrisi et al. (2012), the retention rate at post-baseline was 76.6 % ($N = 1456$) with no evidence of bias with respect to demographic characteristics.

Baseline Measures

All baseline assessments were measured the summer before participants entered college.

Self-identified drinking classes—The measure of subjective personal identification of drinker type was derived from the Brief Drinker Profile (BDP; Miller and Marlatt, 1984) and previously used in the drinking literature (i.e., Geisner et al., 2012). Students were asked to respond to the statement, "Please describe your alcohol usage" with the response options, 1) "I have never tried alcohol," 2) "I have tried alcohol but currently don't drink," 3) "I am a light, social, non-problem drinker," 4) "I am a moderate, social, non-problem drinker," 5) "I am a heavy, non-problem drinker," and 6) "I am a heavy, problem drinker." The individuals who responded, "I have never tried alcohol," or "I have tried alcohol, but I currently don't drink," were combined into one group. The individuals who responded, "I am a heavy, non-problem drinker," or "I am a heavy, problem drinker," were combined into one group. This resulted in four self-identified (SI) classes: 1) Non-drinkers (SI-ND) 2) Light-drinkers (SI-LD), 3) Moderate drinkers (SI-MD), and 4) Heavy drinkers (SI-HD).

Empirically derived drinking classes—Four empirically derived drinking classes were identified with Latent Class Analyses (LCA) by Cleveland et al. (2012) using seven diverse drinking measures. First, *typical daily drinking* was assessed from the number of drinks participants indicated they consumed on each day of a typical week within the past 30 days using the Daily Drinking Questionnaire (DDQ; Collins et al., 1985). Responses from the DDQ were used to derive four measures: 1) an index of the number of *drinks typically consumed on weekdays* (Sunday to Wednesday), 2) number of *drinks consumed on Thursday*, and 3) the number of *drinks consumed on a weekend* (Friday and Saturday). The fifth measure, *frequency of drunkenness*, was assessed using a single item asking students,

“During the past 30 days, how many times have you gotten drunk or very high from alcohol?” Sixth, *Heavy episodic drinking* (HED) was assessed by asking participants to indicate how often in the past two weeks they consumed 4 or more drinks if female, or 5 or more drinks if male, in a two hour period. Seventh, *peak blood alcohol content* (peak BAC) was calculated following established guidelines (Dimeff et al., 1999; Matthews and Miller, 1979) from participants’ reports of the maximum number of drinks consumed on an occasion within the past 30 days and the number of hours they spent drinking on that occasion, using the Quantity/Frequency/Peak questionnaire (QFP; Dimeff et al., 1999; Marlatt et al., 1998). For all items students were informed that a standard drink definition consisted of one 12 oz. beer, 10 oz. wine cooler, 4 oz. wine, or 1 oz. 100 proof (1 ¼ oz. 80 proof) liquor.

Drinking classes were labeled by their most unique drinking aspects: 1) Non-drinkers (LCA-ND), who were unlikely to report any drinking behaviors; 2) Weekend, Light Drinkers (LCA-WLD), who were likely to report drinking in the past month, and only drinking on Fridays and Saturdays; 3) Weekend, Heavy Episodic Drinkers (LCA-WHED), who were likely to report being drunk in the past month, engaging in HED, having a BAC greater than 0.08 on their last peak drinking occasion, but likely to only drink on Fridays and Saturdays; and 4) Heavy Drinkers (LCA-HD), who were likely to report all drinking indicators including weekday drinking.

Protective drinking behaviors—Students’ use of protective behaviors was measured by a modified version of the Protective Behavioral Strategies Scale (Martens et al., 2005). Factor analyses revealed five items that were used to make a composite score of protective factors ($\alpha = .86$). Students were asked how often they engaged in certain protective behaviors, such as, “I eat within 2 hours of drinking.” and responded on a five-point scale ranging from “0 = Never” to “4 = Always.”

Risky drinking—Similar to measuring protective behavior use, five items were identified in a factor analysis and summed for a measure of risky drinking ($\alpha = .87$). Students responded to how often they partake in risky drinking, such as “I drink mixed drinks that I’m unsure of how much alcohol is in them,” using a five-point scale ranging from “0 = Never” to “4 = Always.” Similar measures have been used in other alcohol studies (Kenney et al., 2010).

Positive expectancies of alcohol—Three items, used in previous literature (Turrissi et al., 2000), indicated positive expectancies for alcohol use. The items were as follows: “Alcohol adds fun and excitement to an otherwise boring life,” “If I got really drunk one evening, I don’t think anything bad would really happen to me,” and “Everybody goes through a drinking phase.” Students rated agreement with these statements using a 5 point scale ranging from “1 = Strongly Disagree” to “5 = Strongly Agree,” and they were summed to create a composite score ($\alpha = .68$).

Alcohol use attitudes—A total of five items assessed attitudes towards alcohol use. Four items referred to specific drinking activities: (a) drinking alcohol every weekend, (b) drinking alcohol daily, (c) driving a car after drinking, and (d) drinking enough alcohol to pass out. Participants indicated approval of each drinking activity using a 7-point scale, from “1 = Strong Disapproval” to “7 = Strong Approval.” A single item measured overall attitude toward alcohol, asking participants to indicate which statement best represents them. The response options included: 0 = Drinking is never a good thing to do, 1 = Drinking is all right but a person should not get drunk, 2 = Occasionally getting drunk is okay as long as it doesn’t interfere with academics or other responsibilities, 3 = Occasionally getting drunk is

okay even if it does interfere with academics or other responsibilities, and 4 = Frequently getting drunk is okay if it is what the individual wants to do. The five items were standardized and summed to create a single attitude toward alcohol use index ($\alpha = .72$).

Descriptive peer norms—The Drinking Norms Rating Form (DNRF; Baer et al., 1991) was used to assess descriptive peer norms of drinking alcohol. The DNRF asks participants to indicate the number of drinks they think their close friends typically consume for each day of the week. The seven daily responses were summed to create a measure of the total number of weekly drinks consumed by the friend.

Injunctive peer norms—Using a 7-point scale ranging from “Strong Disapproval” to “Strong Approval,” participants reported their perceptions of their friends’ approval or disapproval of four specific drinking activities (Baer, 1994): “How would your friends respond if they knew... (a) you drank alcohol every weekend, (b) you drank alcohol daily, (c) you drove a car after drinking, and (d) you drank enough alcohol to pass out?” Response options summed to create an overall measure of injunctive norms ($\alpha = .74$).

Follow-up Measures

All follow-up assessments were measured 15-months post baseline assessment.

Total number of alcohol-related consequences over the first year of college—Thirty-two consequences from the Young Adult Alcohol Problems Screening Test (YAAPST; Hurlbut and Sher, 1992) were measured in the fall semester of their sophomore year. A summed total score of consequences was used for the current analyses.

Membership in the Multiple and Repeated Consequence (MRC) group—Consistent with Mallett et al. (2011), participants who indicated that they had experienced 6 or more unique consequences and 5 or more consequences repeatedly (i.e., > 2 times) during the past year were identified as members of the MRC group (coded as 1, where all other individuals were coded as 0). A total of 288 students (15%) were identified as MRC members.

Data Analyses Plan

Comparing Students’ Self-Identified Drinking Classes with LCA Drinking Classes—To determine whether students’ SI drinking classes was consistent with data-driven LCA drinking class, a cross tabulation analysis was performed (see Table 1). This comparison of the subjective (SI class) and objective (LCA class), allowed for an assessment of the relative accuracy of drinker type. Based on these results, individuals whose SI class was consistent with their LCA drinking class (i.e., those along the diagonal) received a “0”. Students who underestimated their drinking pattern (i.e., those above the diagonal) were given a score of “1”. Similarly, when comparing correct estimators with students who *overestimated* their drinker type, the overestimators were given a score of “1”.

Estimation of Drinking Class as a Predictive Factor of Alcohol-Related Consequences—To control for any possible attrition biases, the FIML approach to missing data was used in Mplus. The first analysis regressed total consequences onto the 2-group estimation variable (0 for correct and 1 for underestimate). Secondly, to test how underestimation predicts consequences over and above drinking, the LCA drinker class at follow up was added as a covariate to the regression. The third analysis used a binary logistic regression model regressing the 2-group membership in the MRC group variable (0 for non-member and 1 for member) onto the 2-group estimation variable (0 for correct and 1 for underestimate). An additional analysis was performed adding follow-up LCA drinker

class as a covariate. Lastly, these four analyses were repeated comparing students who *overestimated* drinker type to students who were accurate, and again comparing students who overestimated with students who underestimated.

Individual and Peer Associations With Estimation—Binary logistic regression models were used in Mplus to examine associations between the psychosocial alcohol variables and estimation of drinking. In these analyses, the 2-group estimation variable (0 for correct and 1 for underestimate) was regressed onto each construct (protective behaviors, risk behaviors, positive alcohol expectancies, alcohol self-reflection, attitudes on alcohol, and injunctive and descriptive peer norms). Two sets of models were conducted. First, the 2-group estimation variable was regressed onto each construct separately, and the second included all predictors in the model. Again, these analyses were repeated for the prediction of overestimation (0 for correct, 1 for overestimate). All predictors were centered prior to conducting the analyses.

Exponentiated coefficients were represented by odds ratios. An odds ratio value greater than “1” indicated an increase in the independent variable was associated with an increased likelihood of being in the test group rather than the reference group. Conversely, an odds ratio value less than “1” indicated higher values of the independent variable correspond to a lower probability of being in the test group compared to the reference group.

Results

Comparing Self-Identified Drinker Classes to LCA Drinker Classes

The cross tabulation comparing self-identified drinker class and LCA drinker class (Table 1) showed that a total of 1351 (71%) individuals correctly identified with their LCA drinking class, whereas 347 (18%) students underestimated drinker type. No differences in underestimation were found between sex or ethnicity. Of the students who underestimated, 19.0% (n=66) self-identified as a non-drinker, 69.2% (n=240) as a light drinker and 11.8% (n=41) as a moderate drinker. The percentages of LCA drinker class for underestimators were as follows: LCA-WLD: 11.0% (n=38), LCA-WHED: 74.6% (n=259), LCA-HD: 14.4% (n=50). A total of 10.7% (n=37) of the students who underestimated, self-identified two categories less risky than their LCA drinking class. The remaining students (89.3%, n=310) who underestimated identified with a drinking class that was one category less risky than their LCA drinking class.

A total of 197 (10%) students overestimated their drinker type. Of these students, 68.5% (n=135) self-identified as a light drinker, 24.3% (n=43) as a moderate-drinker, and 7.1% (n=14) as a heavy drinker. A total of 73% (n=141) were established as LCA-ND, 20.0% (n=140) as LCA-WLD, and 6.6% (n=13) as LCA-WHED. The majority of overestimators (94.9%, n=187) identified with a drinker type that was one category more risky than their LCA drinking class.

Underestimation and Consequences

Total number of consequences over first year of college—Regression results revealed that students who underestimated drinker class experienced significantly higher numbers of alcohol-related consequences during their first year ($M = 30.63$ $SD = 19.29$), compared to those who correctly estimated ($M = 20.03$ $SD = 19.07$; $b = 9.77$, $SE = 1.26$, $t = 7.72$, $p < .0001$). When adding the covariate of follow-up LCA drinker class, underestimation remained significantly and positively associated with consequences ($b = 2.56$, $SE = 1.17$, $p < .05$).

Membership in the MRC group—Logistic binary regression results indicated a significant positive association between underestimation and membership in the MRC group ($b = 0.67$, $se = 0.16$, $t = 4.21$, $p < .0001$). The associated odds ratio was equal to 1.96, indicating that for underestimators, the odds of belonging to the MRC group were nearly twice the odds of those who were correct. The effect of underestimation predicting MRC membership did not remain significant after adding the follow-up LCA drinker class as a covariate ($b = 0.16$, $SE = 0.19$, $p = ns$).

Overestimation and Consequences

Total number of consequences over first year of college—Regression analyses comparing students who overestimated to those who were correct showed overestimators were more likely to have a higher number of consequences ($b = 9.49$, $SE = 1.63$, $p < .001$). This association remained significant after adding follow-up LCA drinker class as a covariate ($b = 4.11$, $SE = 1.43$, $p < .01$).

Membership in the MRC group—Overestimators, when compared with accurate estimators, were more likely to belong to the MRC group at follow-up ($b = 0.59$, $SE = .20$, $p < .01$, $OR = 1.80$). Similar to the underestimators, this association became non-significant after adding the follow-up LCA covariate ($b = 0.34$, $SE = 0.23$, $p = ns$).

Comparing Underestimation and Overestimation

Regression analyses of underestimators and overestimators showed no significant differences in total amount of consequences experienced, both without the follow-up drinking covariate ($b = -0.28$, $SE = 1.88$, $p = ns$) and with the drinking covariate ($b = 1.29$, $SE = 1.67$, $p = ns$). Additionally, logistic regression analyses showed no significant differences between these two groups in MRC membership, both without the covariate ($b = -0.09$, $SE = 0.23$, $p = ns$) and with the covariate ($b = 0.11$, $SE = 0.24$, $p = ns$).

Psychosocial Variables and Underestimation/Overestimation

Means and standard deviations for correct, underestimation, and overestimation groups are in Table 2. Underestimators scored significantly higher than correct estimators on all the psychosocial predictors. Similarly, overestimators were significantly higher than correct estimators on protective and risky drinking behaviors, alcohol use attitudes, and positive alcohol expectancies. Overestimators did not differ from correct estimators on descriptive or injunctive peer norms.

Results from the univariate and multivariate logistic binary regression models are presented in Table 3. These results are shown for both the prediction of underestimation and overestimation. In both univariate models, increases in each psychosocial predictor were associated with underestimation and overestimation. In the multivariate model predicting underestimation, all predictors remained significant, except for alcohol use attitudes. Additionally, in this model injunctive norms remained significant, but unexpectedly changed from a positive to a negative association. Finally, for the multivariate model predicting overestimation, only protective and risky drinking behaviors remained significant.

Discussion

The current study is the first to examine whether students' subjective SI drinker types are accurate relative to data driven LCA drinker classes. Our findings supported the hypothesis that individuals who underestimate drinker type are at a higher risk of experiencing alcohol consequences. Further, students who *overestimated* were also found to be at increased risk

of consequences. These findings pose new research questions on the exact relationship between estimation, drinking, and consequences.

Underestimation of Drinker Type

To elucidate why students might underestimate drinker types, we explored psychosocial drinking correlates. Findings revealed that positive expectancies of alcohol, increased risky drinking, and positive descriptive peer norms were associated with higher levels of underestimating. These results were consistent with our hypotheses and prior research (Mallett et al., 2009b; Bosari and Carey, 2001; Ray et al., 2009; Turrisi et al., 2000). Underestimation may be a possible mechanism through which positive expectancies of alcohol, risky drinking and descriptive peer norms affect overall drinking and consequences, and future research should examine these relationships further.

Alternatively, these students may not be able to correctly assess the riskiness of their drinking or behaviors while consuming alcohol. The current study provides evidence that underestimators were engaging in more risky drinking behaviors; however, these students may not be aware that these behaviors increase the likelihood of experiencing negative events. Grant et al. (2011) proposed that when students believe they are less intoxicated, they focus on the current benefits rather than costs. In turn, they place themselves in riskier situations. It is plausible that students who underestimate drinker type may focus only on the benefits and not the consequences of alcohol use. Future studies should examine the relationship between underestimation and individual focus on benefits or consequences.

Unexpectedly, our findings indicated that students who reported higher levels of protective drinking behaviors were also likely to underestimate drinker type. Although seemingly counterintuitive, it is congruous with research finding students who use protective drinking behaviors only experience fewer consequences if they report lower risky drinking (Ray et al., 2009). This may result from students using protective drinking behaviors as a way to feel less intoxicated and to continue to engage in risky drinking. Further, there is a growing body of research indicating that individuals use both protective and risky drinking behaviors, but that risky behaviors may be a better predictor of consequences (e.g., Luebbe et al., 2009). Potentially, students who inaccurately estimate drinker type may engage in protective and risky behaviors, but their risky behaviors undermine the use of protective behaviors. Future studies should examine the relationship between estimation of drinker type and the simultaneous use of risky and protective behaviors.

Contrary to our hypotheses, the analyses revealed a negative relationship between injunctive norms and underestimating drinker type. Although the hypothesis was supported in the univariate analysis, the results were reversed in subsequent multivariate analyses. The reversal of the type of association led us to speculate a possible suppression effect. Currently, there is no compelling theory or literature to aid in explaining the relationship between injunctive norms and underestimation observed in the multivariate model. Additional research is necessary to see if this relationship is an artifact, or whether it can be replicated.

Overestimation of Drinker Type

Interestingly, students who overestimated drinker types were similar to students who underestimated in that they also had increased alcohol consequences. These results may be explained by the alcohol expectancy theory, which has shown that individuals will act as though they are intoxicated if they believe they are drinking alcohol, even when they are not actually consuming alcohol (Smith and Goldman, 1994). Thus, students who overestimate drinker type may be involved in more consequences simply because they *act* like they drink

heavier. Alternatively, before entering college, these students may believe they can drink more without experiencing intoxication or consequences than is actually true. These students may incorrectly perceive their tolerance to be higher and thus be at a higher risk for experiencing consequences.

Further justification that the alcohol expectancy theory and alcohol tolerance may explain the increased consequences in the overestimation group is that only protective and risky drinking behaviors remained significant predictors of overestimation. Similar to underestimators, these students may be engaging in higher protective behaviors to reduce consequences, especially if they perceive themselves to be heavier drinkers than they are. Coupled with possible decreased tolerance, the increased risky drinking behaviors may lead protective behaviors to be ineffective and result in higher experienced consequences. Future studies should examine this relationship further to understand the mechanisms through which both over- and under- estimation affect consequences.

Limitations

Although the study has a substantial sample, it was conducted at a large northeastern university. Research examining different geographical locations and institutions is needed. Additionally, the subjective SI drinker classes are slightly less descriptive than the labels used in the empirically-derived LCA drinker classes. It is not certain if different results would be found if students were asked to choose the specific LCA drinker class they were most like. However, having students choose from LCA drinking classes would be a difficult task since LCA utilizes multivariate patterns. Further, this study did not establish how students decided on their self-identification. It is possible that self-identified drinker type is not only derived from individual introspective evaluation of drinking, but also from social comparison of others' drinking behaviors. More research is needed to understand how students arrive at their personally identified drinking class and how this process may be altered for individuals who are incorrectly identifying the personal drinker type.

Prevention Implications and Future Directions

The present study indicates that a significant proportion of college students underestimate drinker type, placing them at risk for experiencing alcohol consequences. Although we could not determine whether the students minimized the amount they drank or were not able to accurately assess drinking type, our results indicate this misperception was related to experiencing more consequences. Further, *overestimation* of drinking was also indicative of increased alcohol consequences. Future research is needed to investigate the underlying processes that lead to misperceptions of drinking. Research has consistently shown that students tend to increase drinking in the first year of college (Johnston et al., 2011; White et al., 2006). It is possible that misperception of drinker type may influence this transition. Additional research is needed to explore how estimation affects transitions of drinking over the freshman year. Finally, from a prevention standpoint, the present study suggests that interventions could be expanded to include addressing students' misperceptions of drinker type.

In conclusion, the present study underscores the importance of future etiological and prevention research focusing on estimating drinker type and the elevated risk of experiencing alcohol consequences.

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Table 1
Cross-tabulation of Latent-Class Analyses Drinking Class and Self-Identified Drinking Class

Self-Identified Drinking Class	LCA Drinking Class				Total
	LCA-ND	LCA- WLD	LCA- WHED	LCA-HD	
SI-ND	856	38	28	0	922
SI-LD	135	160	231	9	535
SI-MD	9	39	319	41	408
SI-HD	0	1	13	16	30
Total	1000	238	591	66	1895

* Note: Latent drinking classes: 1) LCA-ND- Non drinkers 2) LCA-WLD- Weekend Light Drinkers, 3) LCA-WHED- Weekend Heavy Episodic Drinkers and 4) LCA-HD- Heavy Drinkers. Self-Identified drinking classes: 1) SI-ND- Non Drinkers, 2) SI-LD, Light Drinkers, 3) SI-MD- Moderate Drinkers and 4) SI-HD- Heavy Drinkers

Table 2

One-Way ANOVA of Psychosocial Predictors Comparing Correct, Underestimation and Overestimation of Drinker Type

Psychosocial Variables	Means (SD)			F
	Correct	Underestimation	Overestimation	
Protective Drinking Behaviors	13.05 ^{b,c} (5.72)	14.15 ^a (3.16)	14.99 ^a (3.22)	15.26
Risky Drinking Behaviors	5.99 ^{b,c} (5.21)	9.11 ^{a,c} (3.68)	7.03 ^{a,b} (4.10)	56.92
Pos. Alcohol Expectancies	7.57 ^{b,c} (2.91)	9.50 ^{a,c} (2.27)	8.49 ^{a,b} (2.17)	74.06
Alcohol Use Attitudes	9.03 ^{b,c} (3.63)	10.57 ^a (2.89)	10.02 ^a (2.71)	31.65
Descriptive Peer Norms	6.08 ^b (7.52)	10.75 ^a (9.70)	6.63 ^b (7.40)	49.04
Injunctive Peer Norms	8.42 ^b (3.82)	9.35 ^a (3.41)	8.89 (3.73)	9.22

Note: $p < .05$,

^a sig. different from correct estimators,

^b sig. different from underestimators,

^c sig. different from overestimators

Table 3
Logistic Binary Regression of Psychosocial Variables on Estimating Drinking Type

Predictor	Underestimation			Overestimation		
	Univariate β (SE β)	Odds Ratio	Multivariate β (SE β)	Odds Ratio	Univariate β (SE β)	Multivariate β (SE β)
Protective Behavior	0.05 (0.01) ***	1.05	0.09 (0.02) ***	1.09	0.06 (0.01) ***	0.09 (0.02) ***
Risk Behavior	0.13 (0.01) ***	1.13	0.14 (0.02) ***	1.15	0.06 (0.01) ***	0.09 (0.02) ***
Positive Alcohol Expectancies	0.25 (0.02) ***	1.28	0.15 (0.03) ***	1.16	0.14 (0.02) ***	0.06 (0.04)
Attitudes of Alcohol	0.10 (0.02) ***	1.10	-0.03 (0.03)	0.97	0.08 (0.02) ***	0.03 (0.03)
Descriptive Peer Norms	0.06 (0.01) ***	1.06	0.03 (0.01) **	1.03	0.02 (.01) *	-0.01(0.02)
Injunctive Peer Norms	0.06 (0.01) ***	1.06	-0.07 (0.03) **	0.94	0.04 (.02) *	-0.02 (0.03)

*
 $p < .05$,

**
 $p < .01$,

 $p < .001$