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Alcohol Perceptions and Behavior in a Residential Peer Social Network

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Abstract

Personalized normative feedback is a recommended component of alcohol interventions targeting college students. However, normative data are commonly collected through campus-based surveys, not through actual participant-referent relationships. In the present investigation, we examined how misperceptions of residence hall peers, both overall using a global question and those designated as important peers using person-specific questions, were related to students' personal drinking behaviors. Participants were 108 students (88% freshman, 54% White, 51% female) residing in a single campus residence hall. Participants completed an online baseline survey in which they reported their own alcohol use and perceptions of peer alcohol use using both an individual peer network measure and a global peer perception measure of their residential peers. We employed network autocorrelation models, which account for the inherent correlation between observations, to test hypotheses. Overall, participants accurately perceived the drinking of nominated friends but overestimated the drinking of residential peers. Consistent with hypotheses, overestimating nominated friend and global residential peer drinking predicted higher personal drinking, although perception of nominated peers was a stronger predictor. Interaction analyses showed that the relationship between global misperception and participant self-reported drinking was significant for heavy drinkers, but not non-heavy drinkers. The current findings explicate how student perceptions of peer drinking within an established social network influence drinking behaviors, which may be used to enhance the effectiveness of normative feedback interventions.

Keywords

alcohol use; college students; peer; social network; descriptive norms; normative misperception

1. Introduction

Despite the substantial increase in college-based alcohol harm reduction interventions in the last two decades, heavy drinking in this population remains high, with two-thirds of college students reporting binge drinking (Substance Abuse and Mental Health Services Administration, 2014). Furthermore, meta-analyses of commonly used college alcohol harm reduction interventions demonstrate non-significant (Huh et al., 2015) or small to medium

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(Carey, Scott-Sheldon, Carey, & DeMartini, 2007) effects on drinking reduction among students. These findings point to the need to improve upon existing intervention approaches.

Perceptions of same-aged peers' drinking behavior are among the strongest predictors of college student drinking behavior (e.g., Neighbors, Lee, Lewis, Fossos, & Larimer, 2007). Students tend to believe that peers drink more frequently and heavily than they actually do (e.g., Borsari & Carey, 2003; Martens et al., 2006), and these misperceptions are associated with heavier drinking (Borsari & Carey, 2003; Lewis & Neighbors, 2006; Neighbors et al., 2007). Interventions commonly incorporate personalized normative feedback (PNF), which presents students with accurate information about peer drinking (i.e., descriptive norms) to correct students' overestimated perceptions and, in turn, reduce risky drinking (for reviews see Carey et al., 2007; Larimer & Cronce, 2007). Although typical college students are commonly used as the normative referent, consistent with Social Comparison Theory (Festinger, 1954) and Social Impact Theory (Latane, 1981), studies indicate that perceptions of more proximal referents [e.g., same sex, ethnicity or residence (Larimer et al., 2009) and close friends (Collins & Spelman, 2013; McAlaney & McMahon, 2007)] may be more influential than distal referents in driving students' drinking-related behaviors. Still, a better understanding of *which* proximal referents may be most influential is needed. One randomized controlled trial of web-based PNF found typical student PNF more effective in reducing drinking and related consequences than specific normative referents (i.e., referents based on gender, race and/or Greek affiliation) (LaBrie et al., 2013). However, that trial did not account for participant's level of connectedness to the normative referents, a central moderator of the relationship between norms and drinking (Neighbors et al., 2010).

A major limitation of PNF is that data on actual student norms are commonly collected through campus-based surveys; these data do not reflect actual participant-referent relationships. Despite the theoretical and empirical support for the influence of peers on college students' drinking behaviors, no research to date has examined: 1) how accurately (or inaccurately) students perceive specific peers' drinking based on those peers' actual responses; 2) how perceptions of the drinking of these identified peers relates to personal drinking behavior; and 3) if perceptions of the drinking of identified peers have a stronger association with personal drinking than the more global perceptions of an identified group. Research examining the accuracy and influence of proximal normative perceptions in an identified social network of peers may aid in improving the accuracy of normative peer alcohol use measures and ultimately enhance PNF.

According to the false consensus effect (Marks & Miller, 1987; Ross, Greene, & House, 1977), heavier drinkers tend to overestimate (and lighter drinkers and abstainers underestimate) the prevalence of heavy drinking within their surrounding population to better align with personal behaviors. Moreover, attributional overestimation may be more strongly associated with higher drinking among heavier drinkers whose social relations and milieu emphasize alcohol. In fact, Lintonen and Konu (2004) suggest that norms-based interventions may have unintended consequences for light drinkers who are presented with drinking rates higher than their own. Clarifying how drinking status may moderate the relationship between misperception and personal drinking will provide insight into suitable targets (i.e., global student populations, high-risk student drinkers) for PNF.

1.1 Study Goals and Hypotheses

In the current study, we examined how misperceptions of peer alcohol use, both overall using a global question about residence hall peers, and asking person-specific questions about nominated peers are related to student's drinking behavior. The sample—students living in a campus residence hall—is ideal given that first-year students living in campus dormitories are at heightened risk for heavy drinking (Harford & Muthén, 2001; Harford, Wechsler, & Muthén, 2002) and share alcohol-related attitudes (Bourgeois & Bowen, 2001). Based on existing research and theory, we expected participants to overestimate the drinking of residential peers, with greater overestimation of global peer behavior than of specific important (nominated) peers. Next, we hypothesized that greater *misperception* of both important and global residential peer drinking would be associated with greater self-reported drinking, but that misperception of important peers would show a stronger relationship with participant drinking. Finally, we hypothesized that drinking status would moderate the relationship between both important and global peer misperception and personal drinking such that among heavy (but not non-heavy) drinkers, higher misperceptions would be associated with higher personal drinking behaviors.

2. Method

2.1 Participants

The current sample was drawn from a primarily first-year residence hall in a mid-sized, private college in the northeastern US. Participants not yet 18 ($n = 6$) were excluded, leaving a total of 188 eligible participants. Of these, 129 (69%) consented to participate in the study and completed an online survey. For analytical purposes, isolates (individuals who reported no friends and no one else in the network reported them) were removed ($n = 4$) and individuals who did not provide peer-reports of their friends were removed ($n = 17$). The final sample ($N = 108$) was 50.9% female (0.8% did not answer). The majority were freshman (88.0%) followed by sophomores (10.2%) and juniors (1.9%). Students were 53.7% White, 8.3% Multiracial, 20.4% Asian, 2.8% Black, 1.9% American Indian/Alaskan Native, 3.7% Unknown, and 9.3% "Other." In addition, 13.0% reported Hispanic ethnicity. The racial/ethnic composition of the current sample reflects that of the broader student population.

2.2. Procedure

Midway through the fall semester students living in the residence hall received an invitation email and mailed letter, with a \$5 gift card enclosed, explaining the study. One week later, students were emailed an invitation containing a link to the web-based survey with consent options. Students chose to enroll in the study ($n = 129$), not enroll but allow their name to remain on the network nomination list in the survey ($n = 5$), or "opt-out" by not enrolling and having their name removed from the nomination list ($n = 9$). Reminder emails were sent to non-responders. Participants received \$20 for completing the survey. All procedures met IRB approval at the University.

2.3 Measures

2.3.1 Important Peer Network Survey—The network measure asked respondents to identify up to 10 individuals living in their residence hall who were important to them by selecting these individuals' names from a prepopulated dropdown list of all residents (see Barnett et al., 2014 for more information; adapted from Longabaugh & Zywiak, 2002).

2.3.2 Self-Reported Number of Drinks—Respondents were presented with a standard drink definition (12 oz. beer or wine cooler, mixed drink containing one shot [1.5 oz.] of liquor, 5 oz. of wine) and asked, "On a typical drinking day, how many drinks do you usually drink?" Heavy drinkers were defined as males reporting 5 or more drinks or females reporting 4 or more drinks on a typical drinking day.

2.3.3 Perception of Residential Peer Drinking—Using an item from the Drinking Norms Rating Form (DNRF; Baer, Stacy, & Larimer, 1991), respondents were asked "When a college student in your residence hall drinks, how much does s/he drink?" Response options were: (1) 0 drinks, (2) 1–2 drinks, (3) 3–4 drinks, (4) 5–6 drinks, (5) 7–8 drinks, and (6) more than 8 drinks.

2.3.4 Global Misperception of Residential Peer Drinking—The sample grand mean for self-reported number of drinks (i.e., the average value derived from all participants' self reports) was subtracted from each respondents' global perception of residential drinking to calculate a misperception value. Since the self-reported number of drinks was a continuous value, we converted the categorical response options for perception of residential peer drinking to a number of drinks value (e.g., 3–4 drinks was recalculated as 3.5 drinks) to calculate the global misperception value. A positive value indicated that a participant overestimated the drinking of residence hall peers.

2.3.5 Average Perception of Nominated Peer Drinking—For each residential peer nominated in the network survey, respondents answered the question: "When this person drinks, how much (on average) does s/he drink?" The response options were: (1) s/he doesn't drink, (2) 1–2 drinks, (3) 3–4 drinks, (4) 5–6 drinks, and (5) more than 6 drinks. The midpoint of each category was used (e.g., 3–4 drinks was recalculated as 3.5 drinks) to reflect number of drinks.

2.3.6 Average Misperception of Nominated Peers Drinking—Each peer's self-reported drinking was subtracted from the respondent's perception of that peer's drinking to create a misperception value that was associated with each of the participant's nominated peers. These values were averaged within participant.

2.4 Data Analysis

Network autocorrelation models were conducted to account for multiple observations of an individual in the network (i.e., participants also were nominated peers for other participants) and the multiple observation of the peers in the network (i.e., the peers were also participants). That is, a regular linear regression assumes independence of observations, which is not appropriate in this context; a network autocorrelation model accounts for the

correlation between people who are connected in the network. Network autocorrelation models also were used to conduct interaction analyses. A t-test was used to examine differences in the slopes between models. All analyses were conducted in R using the sna package (Butts, 2010).

3. Results

Means, standard deviations, and correlations between variables are presented in Table 1. Perception of residential drinking and global misperception of residential drinking are perfectly correlated because of the nested nature of the design, in which participants are network members and network members are participants.

3.1 Misperception of residential peer drinking

In contrast to hypotheses, the average misperception of nominated peers' drinking was not significantly different from zero, indicating that there was no evidence that participants were inaccurate in their perceptions of their nominated peers' drinking ($\beta = -0.06$, $SE = 0.15$, $z = -0.41$, $p = 0.68$). However, consistent with hypotheses, the average global misperception of residential drinking was positive and significant ($\beta = .67$, $SE = .20$, $z = 3.32$, $p < .001$), indicating that participants tended to overestimate the drinking of residential peers when asked to estimate peer drinking using a general question. As expected, participants misperceived the alcohol use of college students in the residence hall to a greater extent than they misperceived the drinking of their nominated (residence hall) peers ($\beta = .76$, $SE = .19$, $z = 4.07$, $p < .001$).

3.2 Misperception and personal drinking

Consistent with hypotheses, participant drinking was positively associated with both overestimation of nominated peer drinking ($\beta = .77$, $SE = .11$, $z = 7.33$, $p < .001$) and with overestimation of global residential peer drinking ($\beta = .43$, $SE = .12$, $z = 3.64$, $p < .001$). As expected, there was a significant difference in the slopes ($t(105) = 2.82$, $p = .006$), indicating that overestimation of nominated peer drinking was a stronger predictor of participant self-reported drinking than overestimation of global residential peer drinking.

3.3 Moderating effect of heavy drinking status

In stratified models (by heavy drinking status), we found that there was a significant association between global misperception and participant self-reported heavy drinking ($\beta = 0.49$, $SE = 0.14$, $p < 0.001$) and a non-significant association for non-heavy drinking ($\beta = -0.13$, $SE = 0.10$, $p = 0.199$). In stratified models we found that there was a significant association between misperception of nominated peer drinking and self-reported drinking for non-heavy drinking status (β for heavy drinking = 0.32 , $SE = 0.22$, $p = 0.146$; β for non-heavy drinking = 0.43 , $SE = 0.08$, $p < 0.001$). To test that heavy drinking status was a significant moderator of global misperception and misperception of nominated peer drinking, we fit non-stratified interaction models. In partial support of hypotheses, heavy drinking status of the participant moderated the effect of global misperception on participant self-reported drinking ($\beta = .57$, $SE = .18$, $z = 3.10$, $p = .002$), such that there was a significant association among heavy drinkers ($\beta = .43$, $SE = .13$, $z = 3.40$, $p < .001$) but not

among non-heavy drinkers ($\beta = -.14$, $SE = .13$, $z = -1.07$, $p = .28$) (see Figure 1). In contrast, heavy drinking status did not significantly moderate the association between misperception of nominated peer drinking and participant self-reported drinking.

4. Discussion

Consistent with prior studies, when asked about peer drinking in a general way, college students overestimated the typical drinking of residential peers, and misperceptions predicted personal drinking behavior. However, with respect to nominated peers' drinking, participants reported accurate perceptions, which likely reflects greater familiarity with close friends' drinking behaviors and/or the tendency for students to befriend others who engage in similar behaviors. Despite lower self-other discrepancy for nominated peers, however, overestimated perceptions of these proximal peers were *more strongly* associated with personal drinking behavior than global (i.e., residential) perceptions. This finding is consistent with theories of social comparison (Festinger, 1954) and social impact (Latane, 1981) that highlight the salience of modeling by closest, most proximal others.

Qualifying the above findings was the significant association that emerged between residential peer misperception and alcohol consumption among heavy drinkers, but not light or non-drinkers, even though heavy drinking status did not moderate the association between nominated peer misperception and personal drinking. The failure to find differences by drinking status in the relationship between misperception of nominated peer drinking and self-reported drinking may point to the salience of nominated friends' drinking, regardless of one's own drinking level. Indeed, the drinking behaviors of proximal peers are directly and routinely observable, thus enhancing the credibility of normative beliefs and, in turn, their influence over one's drinking behaviors regardless of drinking status. Therefore, although heavy drinkers exhibit higher levels of drinking relative to non-heavy drinkers overall, the associations between overestimated perceptions of nominated peers and personal drinking do not significantly differ by drinking status. In contrast, that misperception of global peer drinking emerged as a significant predictor among heavy drinkers is consistent with the theory of false consensus (Ross, Greene, & House, 1977) that overestimating peer drinking may serve a particularly important psychosocial purpose for heavy drinkers who may be incentivized to justify their heavy drinking behaviors in relation to broader social norms. Moreover, heavy drinkers matriculate into college endorsing strong beliefs that drinking is an integral part of college life (Crawford & Novak, 2010), which may lead to overestimations of global drinking behaviors and reinforce pre-existing drinking-related beliefs and behaviors.

Notwithstanding the need for prospective studies to elucidate causal processes, these results support that PNF aimed at modifying perceptions of residential peer drinking may be most effective when targeted at high-risk drinkers. In contrast, the association between nominated peer misperception and personal drinking may be more broadly applied to variable drinker typologies. However, while PNF that references data on specific others retrieved through social network methods may provide influential feedback, it may also lack the self-other discrepancy so critical to altering perceptions and hence behaviors. More research is needed to examine, for example, if lower levels of discrepancy related to identifiable friends is more

or less influential than the larger discrepancy related to typical referents. In particular, utilizing social network data must be advantageous enough to justify the costs and resources required to collect it.

Limitations of this study include the cross-sectional design, categorical measures, and the small, mostly first-year, primarily white sample from a single university. Longitudinal research with a larger, more diverse social network that examines the effect of perceptions on prospective drinking behaviors is warranted. Still, these results point to directions that may expand the scope of PNF to include proximal, identifiable peers within students' existing social networks to reduce misperceptions and promote safer drinking behaviors.

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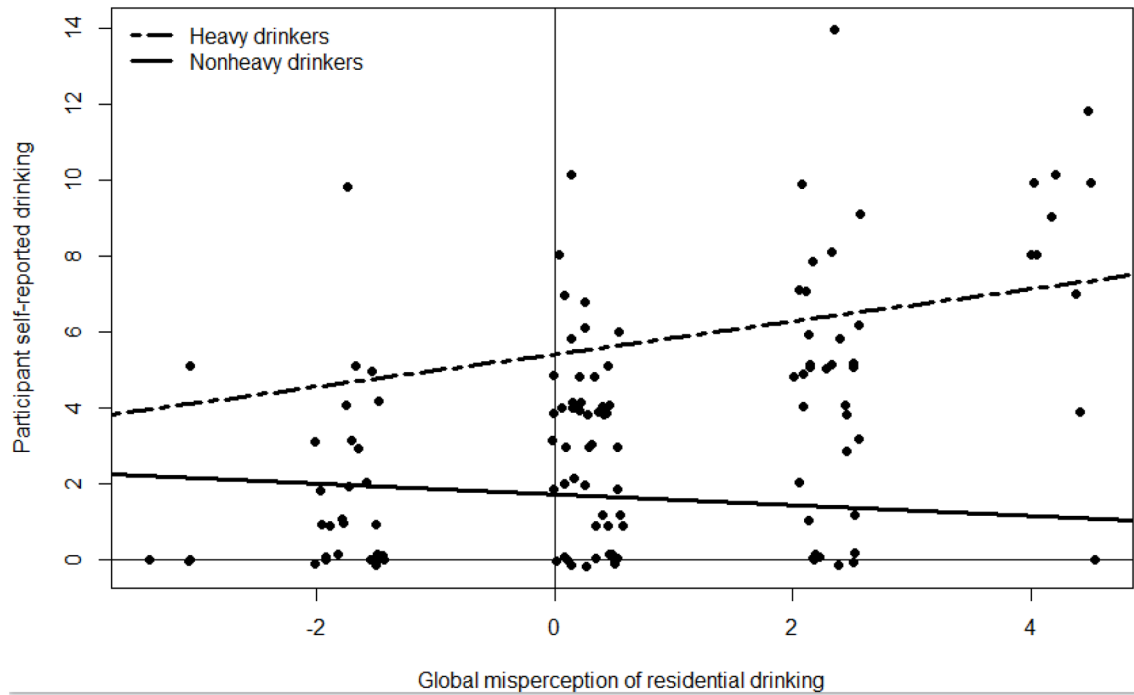


Figure 1. Heavy drinking status of the participant moderates the relationship between global misperception of residential drinking and participant self-reported drinking.

Table 1

Descriptive statistics and correlation table of the key variables.

Variable	Mean	SD	1	2	3	4	5
1. Participant self-reported drinking	3.43	3.16	-	0.72***	0.36***	0.46***	0.46***
2. Average perception of nominated peers drinking	2.80	2.53		-	0.45***	0.30***	0.30***
3. Average misperception of nominated peers drinking ¹	-0.05	1.54			-	0.09	0.09
4. Perception of residential drinking	3.84	1.87				-	1
5. Global misperception of residential drinking ²	0.62	1.87					-

Note. Perception of residential drinking and global misperception of residential drinking will always have a correlation of 1.

¹ Average misperception of nominated peers drinking was calculated by subtracting the peers' self-reported drinking from the respondent's perception of their peers' drinking.

² Global misperception of residential drinking was calculated by subtracting the grand mean of the students' self-reported alcohol use from the respondents' global perception of peer drinking in the residence hall.