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BRIEF REPORT

Does Ethnicity Moderate the Link Between Drinking Norms and Binge Drinking in College Students?

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Abstract

Normative beliefs about typical student behavior are related to student drinking, but ethnic minority students may not view themselves as "typical" and may not match drinking behavior to perceptions of typical behavior. Data were from 18,748 US students in the Fall 2014 National College Health Assessment. Students self-reported ethnicity: White, not Hispanic (63%), Asian/Pacific Islander (12%), Hispanic/Latino (11%), Black/African American (8%), Native American/Alaska Native (3%), or Biracial/Other (4%). Students self-reported binge drinking (5+ standard drinks) in the last 2 weeks, and estimated peak %BAC was calculated. Controlling for age, gender, and fraternity/sorority membership, Hispanic/Latino and Black/African American ethnicity moderated the norms binge drinking and estimated %BAC relationships for and students. Prevention and intervention efforts, such as personalized normative feedback, that use drinking norms should be modified for students from ethnic minority groups. Specifically, norms from students with greater perceived similarity—not "typical" students—should be used in prevention interventions.

Keywords College · Norms · Binge drinking · Ethnicity · Young adult · Alcohol

Heavy drinking is a serious health problem in colleges; recent estimates show US adults 18–22 years old have higher rates of binge drinking than any other age group (Substance Abuse and Mental Health Services Administration [SAMHSA] 2016). Rates of alcohol use disorders for young adults are about twice other ages (SAMHSA 2016). Binge

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drinking increases risks for many adverse consequences, including blackouts, physical injuries, and unprotected sex (American College Health Association [ACHA] 2011). Further, about 5000 people under 21 years of age die every year from alcohol (White and Hingson 2013), and underage drinking has been estimated to cost up to $62 billion/year (Miller et al. 2006).

Efforts to reduce or prevent drinking in undergraduates are clearly needed. Many evidence-based alcohol reduction and/or prevention interventions for college students are based on the theoretical link between perceived drinking norms and drinking (see National Institute on Alcohol Abuse and Alcoholism [NIAAA] 2015). Social norms are theorized to be predictors of college student drinking, and alcohol use norms may be descriptive (e.g., how often students drink) or injunctive (e.g., approval of drinking). Reports in the literature suggested that perceived drinking norms are associated with heavier drinking in college students (e.g., Perkins et al. 2005).

One meta-analysis showed that often students incorrectly believe their peers' level and approval of drinking is greater than their own, and that reference groups, such as gender or fraternity/sorority membership, can influence this relationship (Borsari and Carey 2003). Theories of social comparison (Festinger 1954), social identity (Tajfel 1982), and self-categorization (Turner et al. 1987) suggest that socially proximal reference groups are more relevant and have greater influence than distal reference groups, or a typical-student reference group. That is, norms defined as use of "typical students" may not be as useful for students who are members of ethnic minority groups, as ethnic-matched reference groups (Lewis and Neighbors 2006; Rendon et al. 2000). Investigating the possibility that ethnicity affects the relation between perceive drinking norms and drinking behavior is urgent, given the growing proportion of undergraduate college students in the US from ethnic minority groups. Recent estimates suggest that in the US White, non-Hispanic students are now about two thirds of undergraduate students (66%)—a reduction from 79% in 1990 (U.S. Department of Education 2016). Estimated enrollment for undergraduates from ethnic minorities in 2015 was Black (14%), Hispanic (9%), Asian (8%), and Native American (1%) (U.S. Department of Education 2016).

Drinking behaviors and disorders may differ across racial/ethnic groups, although research is mixed on this point. In particular, relative to White, non-Hispanics, African American women and Hispanic men and women may have increased risk for alcohol disorder with similar levels of drinking (Grant et al. 2012). In addition, Native Americans and Hispanics may have higher rates of high-risk drinking (Chartier and Caetano 2010). Researchers explaining the disparities in alcohol behavior for ethnic minorities have discussed sociocultural explanations, such as increased drinking to cope with stress associated with acculturation and/or racial/ethnic stigma and discrimination (Alegria et al. 2008; Gilbert and Zamore 2016). Biological factors have also been offered as underlying the disparities in drinking behavior across race/ethnicity, including the effect of alcohol-metabolizing genes, although this point is controversial due to the weak relationship between race/ethnicity and ancestry (Zakhari 2006).

To date, there have only been a few studies that examined how ethnicity is related to drinking norms and drinking behavior. In one study of a randomly selected sample of incoming students at one large US west coast university, Larimer and colleagues (Larimer et al. 2009) found that perceived norms for groups that were more closely

related to the participant were related to participants' level of drinking. In a random sample of one large public university and one mid-sized university on the US west coast, Neighbors and colleagues (Neighbors et al. 2010) showed that greater identification with the norm-referent group, such as matched ethnicity, was associated with a stronger relationships between perceived drinking norms and own drinking. In a study of Latino (19%) and White (81%) students from two US west coast universities, Latino students showed a weaker link between drinking and ethnicity-specific norms, compared to typical student norms (LaBrie et al. 2012).

Identifying moderators of the norms–drinking relationship is important to know what students are more likely (or less likely) to benefit from interventions such as personalized normative feedback (Fig. 1). In this study, we extended previous research by testing whether ethnicity moderated the relationship between perceived alcohol use norms and drinking in a national sample of US college students. Drinking behavior was assessed in two ways, self-reported binge drinking and estimated %BAC (blood alcohol concentration). Analyses also controlled for effects of three student characteristics including age, gender, and fraternity/sorority membership. These characteristics were included because they have been linked to drinking in past research.

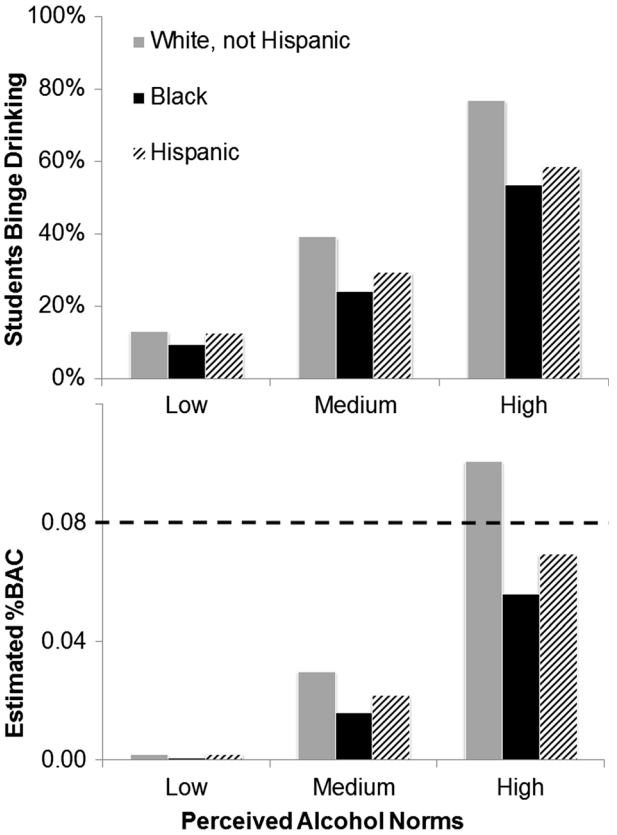

Fig. 1 The relationship between perceived alcohol norms at three levels on student binge drinking (upper) and estimated %BAC (lower) in students from three ethnic groups (White, not Hispanic, Black, and Hispanic). The dashed line shows the .08%BAC, which is the legal limit for driving in the USA

Methods

Participants and Design

Data was from the Fall 2014 National College Health Assessment IIb (NCHA). The NCHA survey has been annually administered by the American College Health Association (ACHA) to students on US college campuses since 2000. Additional information about the survey design and items is available online (ACHA 2014). Participant responses for this project were excluded if students were not undergraduates, international, not full-time, did not report their binge drinking or ethnicity (which were primary variables), or had unknown/transgender gender identity (this proportion was too small to use in analyses). The subsequent analyses used data from 18,748 students. Characteristics of students in each ethnic group are shown in Table 1.

Measures

Student Characteristics This study used three self-reported student characteristics as control variables: age, gender, and fraternity/sorority membership. In the analyses, gender (*man* = 1; *woman* = 0) and fraternity/sorority membership (*yes* = 1; *no* = 0) were dummy coded.

Ethnicity We used self-reported ethnic identity divided into six groups: White, non Hispanic (11,809, 63%), followed by Asian or Pacific Islander (2238, 12%), Hispanic/Latino, of any race (1971, 11%), Black or African American (1438, 8%), Native American or Alaska Native (538, 3%), or Biracial/Other (754, 4%). Table 1 shows student characteristics in each ethnic group. Five separate dummy coded variables for each ethnic group were used in analysis, with White, non-Hispanic as the comparison group.

Perceived Alcohol Use Norms The ACHA-NCHA asks respondents, "How many drinks of alcohol do you think the typical student at your school had the last time he/she "partied"/ socialized?" The responses ranged from 0 (no drinking) to 97. We excluded 31 (0.1% of total sample) extreme values (e.g., responses over 25) on this variable, similar to the strategy used in previous research using this measure (e.g., Perkins et al. 2005; Vaughan et al. 2015). The resulting variable had midpoints approximating a common definition for binge drinking (M = 5.17, SD = 2.89, Mdn = 5).

Table 1 Student characteristics in each ethnic group

	WNH (n = 11,809)		BAA (n = 1438)		HL (n = 1971)		API (n = 2238)		NA (n = 538)		B/O (n = 754)		
Characteristic	*N*	%	*N*	%	*N*	%	*N*	%	*N*	%	*N*	%	*p*
Women	7568	64%	1069	74%	1367	69%	1498	67%	373	69%	507	67%	< .001
Fraternity/sorority	1687	14%	84	6%	186	9%	169	8%	67	12%	73	10%	< .001
Binge drinking	4920	42%	313	22%	592	30%	512	23%	184	34%	216	29%	< .001
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	
Age (years)	20.43	3.89	21.01	5.08	20.56	3.86	19.92	2.48	21.34	5.53	21.12	4.88	< .001
Alcohol norms	5.37	2.82	4.64	2.91	5.14	2.92	4.54	3.00	5.39	3.15	4.78	2.80	< .001
Est. %BAC	0.06	0.09	0.03	0.06	0.05	0.08	0.04	0.07	0.05	0.10	0.04	0.07	< .001

WNH White, not Hispanic, *BAA* Black or African American, *HL* Hispanic/Latino, of any race, *API* Asian or Pacific Islander, *NA* Native American or Alaska Native, *B/O* Biracial or other ethnicity

Binge Drinking Students self-reported whether they had five or more standard drinks of alcohol in one sitting in the previous 2 weeks. This definition is generally consistent with the National Institute on Alcohol Abuse and Alcoholism (NIAAA) (2005) definition, although the recommended cutoff (four) for women is four not five. In analyses, this variable was dummy coded (*binge drinking* = 1; *no binge drinking* = 0).

Estimated %BAC Estimated peak %BAC was calculated by NCHA using an algorithm from the US Department of Transportation, National Highway Traffic Safety Administration (see ACHA 2014). The algorithm uses the self-reported number of standard drinks consumed over the number of hours of the most recent time students had "partied"/socialized, student body weight, estimates for total body water weight (58% for males and 49% for females), and the usual rate of alcohol metabolism (− 0.017/h). The algorithm did not control for food consumption and assumed a constant rate of drinking. For regression analyses, we multiplied the estimated %BAC times 100 (to improve interpretability of coefficients) and took the square root (to correct for positive skew). For reference, in the USA, 0.08%BAC is the legal driving limit for people 21 years old or older.

Analysis Plan

To examine differences between ethnic groups, relationships to binge drinking, and estimated %BAC, we used the GZLM command in SPSS 21, which allowed for logistic regression (binge drinking) and linear regression (estimated %BAC). We examined the interaction between ethnicity and perceived norms after controlling for student characteristics. Specifically, each student characteristic was entered as a control variable, followed by perceived alcohol use norms, the dummy-coded ethnic group variables, and then five interaction terms—one for each ethnic group, e.g., Asian/Pacific Islander, x perceived alcohol norms.

Results

Binge Drinking

Table 2 shows predictors of binge drinking including interaction terms. Binge drinking was related to age, $B = -0.02$, $p < .001$, gender, $B = 0.52$, $p < .001$, and fraternity/sorority membership, $B = 1.04$, $p < .001$. Perceived norms were related to binge drinking, $B = 0.28$, $p < .001$. For binge drinking, there were significant interactions between ethnic group and perceived norms for Hispanic/Latino students, $B = -0.07$, $p = .001$, and Black/African American students, $B = -0.06$, $p = .015$.

Estimated %BAC

Table 3 shows predictors of estimated %BAC with interaction terms. Estimated %BAC was related to age, $B = -0.29$, $p < .001$, gender, $B = -0.61$, $p = .009$, and fraternity/sorority membership, $B = 6.13$, $p < .001$. Perceived norms were related to estimated %BAC, $B = 2.50$, $p < .001$. As with binge drinking, for estimated %BAC, there were significant interactions between ethnic group and perceived norms for Hispanic/Latino students, $B = -0.45$, $p = .001$, and Black/African American students, $B = -0.58$, $p = .015$.

Table 2 Predictors of binge drinking

Predictor	*B*	*SE*	95%CI		*p*
Intercept	− 1.73	0.11	− 1.94	− 1.51	*< .001*
Age	− 0.02	0.00	− 0.03	− 0.02	*< .001*
Men	0.52	0.04	0.45	0.59	*< .001*
Fraternity/sorority	1.04	0.05	0.94	1.13	*< .001*
Norms	0.28	0.01	0.27	0.30	*< .001*
API	− 0.67	0.13	− 0.93	− 0.42	*< .001*
HL	− 0.06	0.13	− 0.31	0.19	.633
BAA	− 0.39	0.15	− 0.69	− 0.09	*.010*
NA	− 0.02	0.23	− 0.48	0.43	.925
B/O	− 0.09	0.20	− 0.48	0.31	.662
API × norms	− 0.01	0.02	− 0.05	0.03	.636
HL × norms	− 0.07	0.02	− 0.11	− 0.03	*.001*
BAA × norms	− 0.06	0.03	− 0.11	− 0.01	*.015*
NA × norms	− 0.05	0.04	− 0.12	0.02	.168
B/O × norms	− 0.06	0.03	− 0.13	0.01	.087

Italics shows statistically significant $p < .05$

API Asian or Pacific Islander, *HL* Hispanic/Latino, of any race, *BAA* Black or African American, *NA* Native American or Alaska Native, *B/O* Biracial or other ethnicity, *WNH* White, not Hispanic, which was the reference group

Discussion

This study expands on past studies that examined the relationship between perceived alcohol norms and drinking behavior in young adult college students, and in particular, extends knowledge about how ethnicity moderates these links. Consistent with past research, this study found that perceived norms were positively related to binge drinking and estimated %BAC in a national sample of US undergraduate college students. That is, students who believed that typical students drank more

Table 3 Predictors of estimated %BAC

Predictor	*B*	*SE*	95%CI		*p*
Intercept	9.98	0.64	8.71	11.24	*< .001*
Age	− 0.29	0.03	− 0.35	− 0.24	*< .001*
Men	− 0.61	0.23	− 1.07	− 0.15	*.009*
Fraternity/sorority	6.13	0.34	5.47	6.80	*< .001*
Norms	2.50	0.05	2.40	2.59	*< .001*
API	− 2.36	0.65	− 3.63	− 1.10	*< .001*
HL	0.08	0.75	− 1.39	1.54	.918
BAA	− 1.50	0.81	− 3.08	0.08	.062
NA	− 2.06	1.32	− 4.65	0.54	.120
B/O	− 1.23	1.16	− 3.50	1.05	.290
API × norms	− 0.06	0.12	− 0.29	0.17	.593
HL × norms	− 0.45	0.13	− 0.70	− 0.21	*< .001*
BAA × norms	− 0.58	0.14	− 0.86	− 0.29	*< .001*
NA × norms	− 0.13	0.21	− 0.54	0.29	.553
B/O × norms	− 0.20	0.21	− 0.62	0.21	.337

Italics shows statistically significant $p < .05$

Estimated %BAC (blood alcohol concentration) was transformed using square root × 100 for analysis, but reversed for figure below

API Asian or Pacific Islander, *HL* Hispanic/Latino, of any race, *BAA* Black or African American, *NA* Native American or Alaska Native, *B/O* Biracial or other ethnicity, *WNH* White, not Hispanic, which was the reference group

heavily were more likely to report binge drinking themselves. However, the link between perceived typical student drinking norms and participant's own drinking was weaker for college students from ethnic minority groups than for White students. The interaction was statistically significant for Hispanic/Latino and Black/African American students but was not statistically significant for Asian or Pacific Islander, Native American or Alaska Native, and biracial students.

These results are partially consistent with ideas from social comparison theory, social identity theory, and self-categorization theory (Festinger 1954; Tajfel 1982; Turner et al. 1987), which imply that norms from reference groups that are perceived to be less similar will have less influence than reference groups perceived as more similar. Although the current study did not directly ask about students' views of "typical" college students, it is plausible that the phrase "typical student" may suggest White students to many students, which would explain why typical norms were more strongly related to drinking for White students than for students from other ethnic groups. It is not clear why there was a significant interaction for only two ethnic minority groups. One possibility is that some racial/ethnic groups may regard themselves as more similar to Whites than others. For example, Asian Americans have been regarded as the "model minority," perceived as excelling in areas considered typical success markers by the predominantly White populace of the USA (Sue et al. 2009). Thus, it could be that Asian Americans do not view themselves as different from the "typical" college students as members of other ethnic groups. Further, Black/African American and Hispanic/Latino college students share common collegial experiences that are distinct from White and other ethnic minority students that may cause them to separate themselves from other college students (Strayhorn 2010). The current national dataset was limited by the absence of measures of cultural values or beliefs. Future research should investigate the interplay of race/ethnicity, perceived drinking norms, and the cultural values, beliefs, practices, and context of college students, in both small- and large-scale studies. Results suggest that interventions, such as personalized normative feedback, that are grounded in the social norms approach should consider using ethnic-specific norms, which may be more appropriate for students who identify as Hispanic/Latino or Black/African American because they may be less likely to view a typical student as similar to them.

Binge drinking and estimated %BAC was lower on average for nearly all ethnic minority groups in this study—the only exception to this pattern was estimated %BAC for Hispanic/Latino students. These results suggest that ethnic minority identity may be protective against drinking in some way. Testing protective factors is beyond the scope of this study, but we suggest that additional work is needed to understand the influence of ethnicity and cultural factors on drinking behavior. We suggest that future research examine cultural beliefs, practices, and values that may be linked to drinking behavior.

This study built on the existing knowledge base by using a large, national sample and examining multiple separate ethnic groups. However, there were several limitations to this study that should be noted. First, responses were self-reported by students, which is a potential source of bias. Second, the data were collected from within single cross-sectional assessment, which prevents inferences of causality. Although the sample was large and drawn from across the USA, it was not a probability sample so generalizability to all campuses cannot be established. Although single-item measures are common in large, national surveys, we recommend that future work use multi-item measures of perceived norms.

In conclusion, the current study found that for students from ethnic minority groups, specifically Hispanic/Latino and Black/African American students, typical student drinking norms had a weaker link to binge drinking and estimated %BAC, compared to White students. These results provide partial support to the theoretical idea that greater similarity of the referent

group may result in greater saliency of norms for drinking behavior. However, there was also evidence that typical student norms are not equally weak for members of all ethnic groups. Future studies should consider cultural norms and identification with different reference groups to expand our understanding of these issues.

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Compliance with Ethical Standards

All procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the Helsinki Declaration of 1975, as revised in 2000. Informed consent was obtained from all participants for being included in the study.

Conflict of Interest The authors declare that they have no conflict of interest.

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