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Descriptive Drinking Norms: For Whom Does Reference Group Matter?

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Descriptive Drinking Norms: For Whom Does Reference Group Matter?

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Abstract

Objective. Perceived descriptive drinking norms often differ from actual norms and are positively related to personal consumption. However, it is not clear how normative perceptions vary with specificity of the reference group. Are drinking norms more accurate and more closely related to drinking behavior as reference group specificity increases? Do these relationships vary as a function of participant demographics? The present study examined the relationship between perceived descriptive norms and drinking behavior by ethnicity (Asian or Caucasian), sex, and fraternity/sorority status.

Method. Participants were 2,699 (58% female) Caucasian (75%) or Asian (25%) undergraduates from two universities, who reported their own alcohol use and perceived descriptive norms for eight reference groups: typical student; same sex, ethnicity, or fraternity/sorority status; and all combinations of these three factors.

Results. Participants generally reported the highest perceived norms for the most distal reference group (typical student), with perceptions becoming more accurate as individuals' similarity to the reference group increased. Despite increased accuracy, participants perceived that all reference groups drank more than was actually the case. Across specific subgroups (fraternity/sorority members and males) different patterns emerged. Fraternity/sorority members reliably reported higher estimates of drinking for reference groups that included fraternity/sorority status, and to a lesser extent males reported higher estimates for reference groups that included males. **Conclusions.** Results suggest interventions targeting normative misperceptions may need to provide feedback based on participant demography or group membership. While reference-

group specific feedback may be important for some subgroups, typical student feedback provides the largest normative discrepancy for the majority of students.

Descriptive Drinking Norms: For Whom Does Reference Group Matter?

Considerable research indicates individuals tend to overestimate the drinking quantity and frequency of others, which in turn is related to individuals' own drinking (Baer et al., 1991; Borsari and Carey, 2003; Larimer et al., 2004; Lewis and Neighbors, 2004). Perceptions of peers' drinking behavior are more strongly related to drinking than are parental attitudes, family history of alcohol problems, drinking motives, or alcohol outcome expectancies (Perkins, 2002; Neighbors et al., 2007). A variety of interventions focus on reducing overestimations of drinking norms, and research has generally supported efficacy of interventions utilizing personalized normative feedback (i.e., provision of accurate information contrasting perceived and actual descriptive drinking norms with participant's own drinking behavior) as an efficacious college drinking intervention, alone or in combination with other prevention components (Carey et al., 2007; Larimer and Cronce, 2007; Walters and Neighbors, 2005). Further, reductions in perceived descriptive norms have been shown to mediate efficacy of these interventions (Borsari and Carey, 2000; LaBrie et al., 2008; Neighbors et al., 2004; Wood et al., 2007).

Research suggests degree of overestimation varies by specificity of the normative referent, and perceived drinking norms for more specific referent groups are uniquely associated with alcohol consumption (Larimer et al., 2009; Lewis and Neighbors, 2004; Lewis et al., 2007). Questions remain, however, regarding the extent to which normative perceptions vary based on specificity of the reference group (i.e., a more global reference to the "typical" student vs. a reference to a more specific referent), and the extent to which perceived drinking norms for more specific reference

groups differ from individual drinking behavior. Thus, it would be helpful to know whether students perceive differences in the prevalence of drinking of typical students, versus male/female students, versus male/female fraternity/sorority students, versus Caucasian male/female fraternity/sorority students. Similarly, it would be helpful to know whether students are more accurate in estimating the drinking prevalence of peers who are more similar to themselves, and whether the relationship between their own drinking and normative perceptions based on more specific and similar reference groups is related to participants' own demographic characteristics. These are not minor issues, given the diversity of college student populations, and emerging data suggesting that efficacy of normative feedback interventions is moderated both by student characteristics and identification with normative reference groups (Lewis and Neighbors, 2007; Neighbors et al., 2010). The current research is designed to address these gaps in the literature in order to provide a basis for strengthening normative feedback interventions. Specifically, the purpose of the present study was to evaluate variability and accuracy of perceived norms for reference groups at increasing levels of specificity and similarity to the respondent and to evaluate differences between perceived norms for different reference groups and personal behavior as a function of participants' own gender, Greek status, and ethnicity (Asian or Caucasian).

Specificity of the Normative Referent Group

Although there is now general consensus that perceived norms are important and an appropriate target for interventions, there remains an open question with respect to which normative referents matter most and for whom. Specifically, although several social psychological theories support the importance of proximal reference groups as

more relevant and thus having greater potential to influence an individual's behavior (e.g., Festinger, 1954; Latane, 1981; Tajfel, 1982; Turner et al., 1987), alcohol research has commonly focused on perceived norms for the typical student (i.e., "college students in general" or "a typical student at your school"; Borsari and Carey, 2003). The quality of peer relationships in terms of level of intimacy, stability, and perceived support appears to be important in determining the magnitude and direction of peer influences on drinking (Borsari and Carey, 2006). Recent studies found greater identification with a given group moderates associations between perceived drinking norms for that group and one's own drinking (Neighbors et al., 2010; Reed et al., 2007). Moreover, interventions have targeted group-specific normative misperceptions, including gender-specific norms (Lewis and Neighbors, 2004; 2007; Lewis et al., 2007; Thombs et al., 2005), freshman-specific norms (Lewis et al., 2007) and Greek-specific norms (LaBrie et al., 2008). These efforts demonstrated group-specific perceptions influence individuals' behavior and thus targeting these norms can assist in reducing drinking. For example, among intercollegiate athletes, perceived norms of a school-and gender-specific athletic peer reference group explained 69% of the variance in drinking (Hummer et al., 2009). After receiving group-specific normative feedback, athletes reduced their normative perceptions and drinking to more closely align with actual group norms (LaBrie et al., 2009). Thus, research is emerging to suggest that, at least for certain groups of students, greater specificity of the normative reference group is important in understanding and utilizing the influence of normative perceptions and misperceptions to reduce drinking.

Recently, Larimer et al. (2009) explored questions regarding specificity of the normative reference group with respect to three dimensions of specificity: gender, ethnicity, and residence type (i.e., Greek system housing, residence halls). Results indicated college students did distinguish among the three different reference groups in estimating perceived descriptive norms (i.e., overestimated the drinking among the three levels of specificity compared to both their own behavior and the mean of each specific group). Additionally, perceived norms for more specific groups (i.e., at two or three levels of specificity, such as gender-ethnicity specific) were uniquely related to participants' own drinking. Thus, these three levels of specificity may have particular salience for individuals in assessment of perceived norms and interventions targeting these misperceptions. However, this research did not take the next step in determining whether these findings were similar for everyone or depended on students' own demographic status (i.e., gender, Greek-status, or ethnicity). Thus, the current study extends prior work in this area.

Gender-specificity. Male college students drink more frequently and with heavier drinking episodes relative to female students (Johnston et al., 2008; McCabe, 2002; O'Malley and Johnston, 2002). Research suggests perceptions of normative drinking function differently for men and women (Lewis and Neighbors, 2004, 2006; Suls and Green, 2003) and presentation of gender-specific feedback has been shown to be an effective intervention technique particularly for female students with strong identity with their gender (Lewis and Neighbors, 2007). Gender specificity may be particularly relevant for women given that female norms are lower than male norms or "typical student" norms. In addition, men and women tend to both view the typical

student as male (Lewis and Neighbors, 2006), which suggests that perceptions of typical student drinking may be more similar to perceptions of male drinking than female drinking.

Ethnicity/race specificity. Caucasian and Hispanic college students reporting heavier drinking and more alcohol consequences compared to African-American and Asian students (Office of Applied Studies, 2008; Pascal et al., 2005; Wechsler et al., 2000). Despite lower prevalence rates on average, Asian students are a group of particular interest and may be disproportionately understudied in clinical alcohol-related research among college students. There is wide variability in drinking behavior between Asian and Caucasian students and large individual differences within Asian populations (Office of Applied Studies, 2008; Lum et al., 2009). Further, the stereotype that Asian students are not at risk for heavy episodic drinking and related consequences is inaccurate. Wechsler and colleagues (1998) found nearly a quarter of Asian college students reported heavy episodic drinking at least once in the past 2 weeks, and Asian students experienced the greatest increase in prevalence of heavy episodic drinking from 1993-1997 of any student group (Wechsler et al. 1998; Wechsler et al. 2002). In addition, Asian American young adults have experienced significant increases in rates of alcohol abuse and dependence in recent years (Grant et al. 2004; Substance Abuse and Mental Health Services, 2008). Given that Asian Americans are the fastest-growing ethnic minority group in the United States (Barnes and Bennett, 2002, increased rates of heavy episodic drinking and alcohol use disorders in this population are cause for concern.

Relatively little is known about how ethnicity/race specific normative perceptions of alcohol use are related to actual drinking behavior for ethnic minority populations in general and Asian college students in particular. Caetano and Clark (1999) found that Caucasians, African-Americans, and Hispanics with more “liberal” attitudes and greater perceived approval of drinking behavior were more likely to be heavy drinkers in comparison to those with more “conservative” attitudes and lower perceived approval of drinking behavior. Similarly, Larimer et al. (2009) found perceived norms for same-ethnicity referents were closer to ones’ own drinking than were typical student norms. However, Larimer and colleagues were unable to evaluate the extent to which this finding was moderated by ethnic minority or majority status, nor to evaluate normative perceptions for specific ethnic groups. The present study thus extends prior research in important ways by adding to the literature on the role of drinking norms in Asian American college student populations in particular.

Greek-status specificity. Members of Greek social organizations (fraternities and sororities) drink more heavily and more frequently than other students and report higher levels of alcohol-related consequences than non-Greek affiliated students (Cashin et al., 1998; Larimer et al., 2004; Park et al., 2008; Sher et al., 2001). Research has shown that fraternity membership is a strong predictor of frequency of heavy drinking (Wechsler et al., 1995) for both alcohol-experienced and alcohol-naïve beginning college students (Lo and Globetti, 1995). Overestimations of Greek-specific drinking have been documented and shown to associate with individual drinking rates (Bartholow et al., 2003; Larimer et al., 2004; Larimer et al., 1997) and correction of fraternity and sorority specific perceived norms have mediated reductions in drinking

during intervention (LaBrie et al., 2008). Interestingly, while Greek affiliated students may overestimate the drinking of other fraternity/sorority members, they may correctly estimate their drinking to be heavier than typical students (Larimer et al., 1997). Thus, Greek affiliated students may dismiss the normative information presented on “typical students” in traditional social norms approaches because they identify with other Greek affiliated students and “typical students” may not be a relevant or important reference group from their perspective. Further examinations of the accuracy of normative perceptions among Greek affiliated students and of how Greek-specific perceptions are influential in predicting drinking behavior are needed.

Summary and Hypotheses

Though findings of Larimer et al. (2009) suggest that specificity of normative referents, in particular for gender, ethnicity, and residence type, is uniquely predictive of one’s own drinking, additional research is needed to more fully understand the relationship of normative specificity to drinking behavior of diverse groups of students. Specifically, the Larimer et al. (2009) study was not sufficiently powered to conduct analyses of moderators of these effects. The current study extends these findings by increasing the sample size, focusing specifically on Asian and Caucasian students to better understand the impact of ethnicity on the relationship between perceived norms and drinking, and including sufficient samples of Greek system and non-Greek system members to evaluate differential patterns of relationship between norms and behavior among these different subsets of the population.

In the current study, we assessed self-reported drinking and perceived descriptive drinking norms for students at increasing levels of similarity to the

respondents, based on a generic referent (typical student), similarity at one level (sex, ethnicity, or Greek), two levels (sex and ethnicity, sex and Greek, or ethnicity and Greek), and all three levels (perceptions of students who match the respondent on sex, ethnicity, and Greek affiliation). We hypothesized that students' estimates of drinking behavior would vary by level of specificity of the normative referent group and that estimates would generally decrease as level of specificity increased. Furthermore, we expected that all estimates would be higher than the actual reported drinking behavior of the sample. In relation to relevant demographics (i.e., Greek, sex, and ethnicity), we expected that estimates for normative referent groups in which Greek was included would be higher than estimates for when Greek was not included. We hypothesized that estimates for normative referent groups in which sex was included would be higher for male normative referents than for female normative referents (Lewis and Neighbors, 2004), and estimates for normative referents including ethnicity would be higher for Caucasian referents than for Asian referents. Finally, we aimed to examine the extent to which accuracy of normative perceptions for more general versus more specific reference groups would vary among Greek, sex, and ethnic (Asian versus Caucasian) subgroups.

Method

Participants and Recruitment

Participants were undergraduate students who self-identified as Caucasian or Asian, recruited from two west-coast campuses during Fall of 2007. Campus 1 ($n = 1,607$) is a large, public research university with an undergraduate enrollment of more than 27,000 students. Campus 2 ($n = 1,091$) is a private mid-size university with

approximately 6,000 undergraduate students. A random sample of 7,000 registered students (3,500 from each campus) received letters and emails describing the study and containing a link to participate, along with a unique participant identification number (PIN). Once students clicked on the link and entered their PIN, an IRB-approved informed consent screen appeared. After providing consent, participants were routed to a 25-minute survey for which they received \$20. All measures and procedures were reviewed and approved by the local IRB on both campuses.

Of 3,753 respondents (54% response rate; $n_1=1936$; $n_2=1817$), 2,699 (58% female) self-identified as Asian or Caucasian and were included in the present analyses. Participants' age ranged from 18-25 years ($M = 19.8$, $SD = 1.4$) with 96% of students aged 18-22 years. Seventy-five percent of participants self-identified as Caucasian ($n = 2,012$), whereas 25% self-identified as Asian ($n = 687$). Of the 3,248 students who did not respond (47.8% female), 56.5% were Caucasian ($n = 1,835$) and 19.3% Asian ($n = 627$). Thus, responders somewhat over-represented females and Asian students relative to the campus populations.

Combining both campuses, participants reported consuming an average of 6.4 ($SD = 8.9$) drinks per week (Campus 1 averaged 5.2 ($SD = 8.3$) drinks per week; Campus 2 averaged 8.0 ($SD = 9.6$) drinks per week). A total of 32.5% of students described themselves as non-drinkers (37.4% Campus 1; 27.3% Campus 2). Students who identified themselves as drinkers (67.5%) reported an average of 8.9 ($SD = 9.1$) drinks per week, with a frequency of 2.4 ($SD = 1.3$) drinking occasions per week (Campus 1, 8.2 drinks per week ($SD = 9.0$) on 2.3 ($SD = 1.3$) drinking days per week; Campus 2, 9.7 ($SD = 9.2$) drinks per week on 2.4 ($SD = 1.3$) drinking days per week).

Measures

In addition to demographic information (age, gender, ethnic/racial identification, type of residence, and Greek membership), measures in the survey relevant to the current study include items assessing alcohol use and perceived descriptive norms for alcohol use.

Alcohol consumption. The Daily Drinking Questionnaire (DDQ; Collins et al., 1985; Kivlahan et al., 1990) assessed average drinking on each day of a typical week, estimated over the past month. Participants were provided with information regarding a standard drink, for use in all measures of alcohol consumption and perceived descriptive norms. Specifically, a drink was defined as a beverage that contained approximately one half ounce of ethyl alcohol (with examples provided ranging from 12 ounces of beer to 1 measured shot of hard alcohol).

Perceived descriptive norms. The Drinking Norms Rating Form (DNRF; Baer et al., 1991) parallels the DDQ, and assesses participants' perceptions of their peers' drinking habits. Participants provided an estimated number of drinks consumed by the typical student in each of their 8 reference groups (described below) for each day of the week, resulting in 56 estimations.

Reference Groups. Participants answered DNRF items for eight reference groups. Reference groups were operationalized at four levels of specificity, involving estimations for referent groups of increasing similarity to the respondent based on gender, ethnicity, and Greek social organization membership. Thus, the first level of specificity was the typical student on a given campus. The second level referred to the typical student similar to the respondent on a single level across these dimension (e.g.,

“typical male student”; “typical Asian student”; “typical student in a Greek social organization”). The third level involved all combinations of two types of specificity (e.g., “typical male Asian student”). The final level involved estimation of drinking behavior for the typical student matching the respondent on all 3 levels of specificity (e.g., “typical female Asian, non-Greek student”).

Results

Descriptive Analyses

Participants’ normative estimates of drinking across a variety of referents are shown in Figure 1. Mean normative drinking estimates for the typical student are highest, and as the reference group becomes more similar, estimates are generally decreasing, though this pattern is not as clear when several reference groups are combined (e.g., students with similar ethnicity and Greek status). Moreover, all estimates are far above the mean of student’s actual reported weekly drinking, by approximately a factor of two.

Figure 2 presents means and 95% confidence intervals for normative drinking estimates, with data presented by gender, ethnicity, and Greek status of the respondent. The figure reveals that the overall downward trend in normative drinking estimates by more specific referents does not hold for all subgroups. In particular, the downward trend with increasing specificity is primarily driven by non-Greek students, regardless of ethnicity or gender (solid black lines in all four panels), though somewhat more notable among women (solid black lines in right two panels). There also appear to be interactions (tested below) between demographic characteristics of the participants and specific referent groups. This is most obvious with Greek students (dotted lines in

each panel), who show reliably higher drinking estimates for referent groups with Greek identities. To a lesser degree, a similar pattern appears with gender (i.e., men in left panels reliably show higher estimates and women in right panels lower estimates when gender is part of the referent) and with ethnicity (i.e., white students in upper panels show reliably higher estimates for students of the same ethnicity relative to Asian students in lower panels). The variability in confidence intervals is strongly related to sample sizes for the various subgroups (e.g., there were only 21 Asian men in fraternities and 25 Asian women in sororities).

Multilevel Model of Descriptive Norms

A multilevel model was fit to the descriptive norms data that directly maps on to the data presented in Figure 2. Specifically, log-transformed estimates of drinking were the dependent variable and dummy-coded predictors included: type of referent (seven contrasts compared to typical student), gender, ethnicity, and Greek status. A random intercept term accounted for the correlation due to eight drinking estimates for each student. Given the patterns shown in Figure 2, we included all main effects, two-way interactions, and three-way interactions. The resulting model is quite complex, including 56 separate fixed-effects, though these are estimated from a total of 21,148 data points. Given that the present focus is on broader patterns of drinking across referents and demographics characteristics, omnibus F-tests are used as opposed to presenting all 56 individuals fixed-effects (though tables with these effects are available from the first author). As seen in Table 1, all main effects are significant, as are all two and three-way interactions involving type of referent. These results broadly confirm what is seen in Figure 2, that drinking estimates at different levels of specificity vary by demographic

subgroups. For example, the reference x Greek x gender interaction reflects that Greek men and women make higher drinking estimates when Greek is part of the referent, but that men increase their estimates by a greater amount.

Multilevel Model of Difference between Normative Estimates and Actual Drinking

Figures 1 and 2 demonstrated that college students overestimate true drinking rates. However, it is possible that particular subgroups are more accurate than others in their estimates. To examine this, we created a new dependent variable that was the difference between the students' own reported drinking and their estimates for each of the eight referents. A multilevel model similar to that for descriptive norms was fit, but using the difference score as the outcome (and without the log transformation, which was not needed). Results are found in Table 2, and means and 95% confidence intervals for each subgroup are found in Figure 3.

The results show that every term in the model involving type of referent is significant, whereas most terms not involving type of referent are not (with the notable exception of the main effect of Greek status). This reveals that once a student's own drinking is taken into account (in the difference score), most subgroup differences based on demographic factors go away. This is not surprising as self-reported drinking and normative estimates of drinking are moderately correlated ($r = .45$), and the difference score essentially removes the student's drinking from the variance in their normative estimates. This effect is also seen in Figure 3. Within a subgroup (i.e., the pattern of connected means within each panel of the figure), there is still notable variability, but the differences between subgroups (i.e., average effects by gender or ethnicity) are largely absent, with the exception of Greek status.

With the difference score, a value of zero means that the drinking estimate is the same as the individual's self-reported drinking. Virtually every mean in Figure 3 is positive, meaning that regardless of referent category or demographic subgroup, students generally overestimate other's drinking relative to their own. Greek students reveal several negative and near zero difference scores, and thus might be considered more accurate in their drinking estimates (and this is driven primarily by their higher drinking rates). However, this interpretation would only apply to reference groups not including Greek as part of the identity. In instances where Greek status is part of the referent group, Greek members – as with other demographic subgroups – overestimate normative drinking relative to their actual drinking.

Discussion

The current study was designed to extend the results of Larimer et al. (2009) and contribute to the literature regarding normative perceptions and misperceptions of drinking, by examining the degree of relationship between norms for general versus more specific reference groups and actual drinking behavior, and evaluating the extent to which personal characteristics of participants (i.e., sex, ethnicity, and Greek status) moderated these relationships. Results replicate and extend prior findings (Larimer et al., 2009) indicating perceived norms for reference groups at different levels of specificity vary, and that in general students report the highest perceived norms for the most distal reference group (i.e., typical student), with perceptions becoming more accurate as similarity to the reference group increases. Despite this increasing accuracy, students perceive that all reference groups consume more alcohol than is actually the case.

Extending the existing social norms literature, the present findings show that when considering specific subgroups of students (especially Greek members and males) different patterns emerge. Specifically, members of the Greek system reliably report higher estimates of drinking for reference groups that include Greek status, and to a somewhat lesser extent males report higher normative estimates for reference groups that include males. Further, members of the Greek system are more likely to report that non-Greek reference groups drink less than they themselves drink, whereas they continue to report perceived norms for Greek reference groups that are higher than their own drinking. This was true for both men and women and for both Asian and Caucasian Greek members, though the largest effects of Greek status by reference group are noted among men.

The current research also extends the social norms literature through the inclusion of a large sample of Asian students, and evaluation of the relationship of both Asian-specific and generic (“typical student”) norms to personal drinking in this population. Both types of norms were positively related to personal drinking, and even within this relatively lower-drinking sub-population the norms for both Asian students and typical students are over-estimated. This reduces concerns that provision of normative feedback regarding typical students might increase drinking among lower-drinking subsets of the population, and provides support for the use of normative feedback interventions for Asian students. Given the rapid growth among Asian ethnic groups in the US (Barnes and Bennett, 2002 and recent increases in heavy episodic drinking and alcohol use disorders in this population (SAMSHA, 2008), these findings have implications for college drinking prevention in diverse populations.

The present research provides a unique contribution to the emerging literature related to social norms and drinking among college students. Early work in this area (e.g., Baer et al., 1991; Perkins and Berkowitz, 1986) indicating that perceptions of other's drinking are inaccurate overestimations and that these perceptions are strongly associated with behavior have been consistently confirmed (Borsari and Carey, 2003). More recently, investigations have begun to consider the importance of who the "others" are, how they relate to the perceiver, and how these factors might translate into improved strategies for prevention and treatment. While some research has considered who the others are from a subjective standpoint (i.e., quality of the peer relationships or how closely one identifies with the relevant group; Borsari and Carey, 2006; Neighbors et al., 2010; Reed et al., 2007) other research has evaluated specificity as a function of more objectively defined group membership based on demographic representation (e.g., Lewis and Neighbors, 2006; Larimer et al., 2009), gender (Lewis and Neighbors, 2004; Suls and Green, 2003), and class standing (Pedersen et al., 2010), among other dimensions. The present research represents the most comprehensive evaluation of the influence of group specificity of drinking norms on alcohol consumption to date.

Results from the present research have direct implications for alcohol prevention and intervention on college campuses. Relevant to normative feedback interventions are the apparent changes occurring in who makes up these others described above, in addition to what might be the typical student on college campuses. It has been suggested that there is an increasing similarity between the general population and the college population in terms of demographic representation (CASA, 2003); as the United States reflects greater diversity, so will the nation's college campuses. This could have

direct implications for traditional norms-based interventions describing what the typical student does, and highlights the value of efforts (such as the current study) to understand what type of norm could be most impactful and for whom it could be most effective. Further, increased diversity on college campuses also reflects the need to be aware of potential cultural barriers to access efficacious interventions. For example, Eisenberg and colleagues (2007) examined factors associated with failure to access clinical services among a sample of college students who screened positive for depression and felt they needed help. One factor associated with not seeking help included less service utilization by those who identified as Asian or Pacific Islander. The authors suggest colleges and universities take steps to address issues that could interfere with student access to interventions (Eisenberg et al., 2007). Incorporating prevention elements most related to drinking by Asian students, such as ethnicity-specific normative feedback, may improve prevention efforts through increasing perceived relevance of the intervention, and represents a step toward determining unique needs related to student diversity. Future research efforts designed to better understand the role of drinking norms for different reference groups in diverse populations and contexts is needed.

Despite potential advantages of incorporating more specific reference group norms into feedback-based interventions, prior research has suggested the magnitude of the discrepancy between the perceived and actual norm, as well as discrepancy between the actual norm and ones' own drinking, are important factors influencing the impact of normative feedback on drinking behavior. From this perspective, the current data suggest provision of feedback targeting the largest discrepancy between actual

and perceived norms would focus on typical student drinking behavior for the majority of students. In contrast, theories highlighting the role of reference group salience in impact of normative feedback would suggest that, at least for members of the Greek system, Greek-specific feedback may have greater impact. This may be especially true for men in the Greek system, who are already aware that they drink more than the typical student. Findings from the present research are congruent with recent interventions which interactively provide group-specific norms within intact groups using real-time interactive technology (LaBrie et al., 2008, 2009) and suggest that these approaches may be especially effective for use in fraternities.

Limitations

Although a strength of the study was inclusion of multiple sites (i.e., one large and one mid-sized university) with the current sample representing approximately 5% and 20% of the undergraduate population respectively, both institutions were located in the western United States, which may limit generalizability to universities and colleges in different areas of the United States or in different countries. In addition, assessment at institutions smaller in size, such as small liberal arts colleges with student populations in the low thousands, may have revealed different patterns related to group membership. Further, we selected ethnicity (Asian and Caucasian), sex, and Greek affiliation as possible referents, and it is possible that in other settings (e.g., schools without fraternities or sororities) alternative referents could have revealed different patterns or been viewed as more salient. Related to methodology, questions addressing normative categories were not counterbalanced when presented to participants, so the order in which the reference groups were introduced could have impacted response

sets; this could be examined in subsequent research. Additionally, the study relied on self-reported data collected over the Internet. However, research suggests confidential surveys may enhance reliability and validity of self-report (Babor and Higgins, 2000; Babor et al., 1987; Chermak et al., 1998, Darke, 1998) and response rates are typically higher for web-based than mailed surveys (McCabe et al., 2006). Although the 54% response rate for the current study is typical of internet-based college drinking research and the obtained sample was broadly representative of the campus population, women and Asian students were somewhat over-represented, which could influence generalizability of the results. Finally, the study was cross-sectional by design and both drinking and perceived norms were assessed at the same time point. There is potential for perceived norms (at varying levels of specificity) to impact students at varying points in their college career, particularly if engagement in different groups and friendship circles on campus changes throughout college (e.g., a male drops out of fraternity during his third year; a female student joins a mostly male-dominated athletic club sport and begins spending most of her free time with male friends). While research suggests perceived norms are relatively stable over time, perceived norms at one time point may predict future drinking at another (Neighbors et al., 2006). Additional research evaluating how perceived norms of varying levels of specificity predict later drinking is warranted.

Conclusion

Given these findings, future research may need to be more granular in considering which normative feedback to provide for specific populations, and whether to do so individually or in group format. Continued research is needed to evaluate whether some

student populations respond better to typical student feedback whereas others benefit from feedback specific to their normative reference group. Moreover, studies will need to further integrate the role of identification with the normative reference group as a potential moderator of these treatment effects. For example, someone who more closely identifies with the student body as a whole may respond better to typical student norms whereas someone who closely identifies with their ethnic group, gender, or Greek affiliation may not. In addition, this study did not examine reference groups that may feel more marginalized from the student body, such as sexual minority students. It is possible that more marginalized students may be particularly important to examine as those who may most benefit from tailored normative feedback. Exploration of the influence of norms for majority and minority students in additional ethnic groups, such as Latino and African American students, is also an important future direction.

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Table 1.

HLM Results of Descriptive Norms Predicted from Type of Referent, Gender, Ethnicity, and Greek Status

Variables	<i>df</i>	<i>F</i>	<i>p</i>
Intercept	1	39898.7	< .01
Reference	7	172.4	< .01
Greek	1	221.3	< .01
Gender	1	52.8	< .01
Ethnicity	1	154.7	< .01
Reference x Greek	7	303.3	< .01
Reference x Gender	7	203.4	< .01
Reference x Ethnicity	7	133.1	< .01
Greek x Ethnicity	1	8.0	< .01
Greek x Ethnicity	1	0.2	= .68
Gender x Ethnicity	1	0.3	= .57
Reference x Greek x Gender	7	9.5	< .01
Reference x Greek x Ethnicity	7	3.5	< .01
Reference x Gender x Ethnicity	7	2.4	< .02
Greek x Gender x Ethnicity	1	0.3	= .56

Table 2.

HLM Results of Difference Between Descriptive Norms and Actual Drinking Predicted from Type of Referent, Gender, Ethnicity, and Greek Status

Variable	<i>df</i>	<i>F</i>	<i>p</i>
Intercept	1	1382.5	< .01
Reference	7	53.2	< .01
Greek	1	8.5	< .01
Gender	1	1.8	= .18
Ethnicity	1	0.1	= .75
Reference x Greek	7	392.7	< .01
Reference x Gender	7	249.3	< .01
Reference x Ethnicity	7	72.4	< .01
Greek x Gender	1	4.5	< .03
Greek x Ethnicity	1	0.7	= .41
Gender x Ethnicity	1	2.4	= .12
Reference x Greek x Gender	7	62.9	< .01
Reference x Greek x Ethnicity	7	7.2	< .01
Reference x Gender x Ethnicity	7	2.5	< .01
Greek x Gender x Ethnicity	1	2.3	= .13

Figure Captions

Figure 1. Mean and 95% Confidence Intervals for Normative Drinking Across Eight Reference Groups. M and SD are reported adjacent to plotted data. Acronyms for reference groups: Typ = Typical, Sx = Same gender, Eth = Same ethnicity, Gr = Same greek status, SxEth = Same gender and ethnicity, SxGr = Same gender and greek status, EthGr = Same ethnicity and greek status, SxEthGr = Same gender, ethnicity, and greek status.

Figure 2. Mean and 95% Confidence Intervals for Normative Drinking Across Eight Reference Groups, Separately for Subgroups of Gender, Ethnicity, and Greek Status. M and SD are reported adjacent to plotted data. Acronyms for reference groups: Typ = Typical, Sx = Same gender, Eth = Same ethnicity, Gr = Same greek status, SxEth = Same gender and ethnicity, SxGr = Same gender and greek status, EthGr = Same ethnicity and greek status, SxEthGr = Same gender, ethnicity, and greek status

Figure 3. Mean and 95% Confidence Intervals for Difference Between Normative and Actual Drinking Across Eight Reference Groups, Separately for Subgroups of Gender, Ethnicity, and Greek Status. M and SD are reported adjacent to plotted data.

Acronyms for reference groups: Typ = Typical, Sx = Same gender, Eth = Same ethnicity, Gr = Same greek status, SxEth = Same gender and ethnicity, SxGr = Same gender and greek status, EthGr = Same ethnicity and greek status, SxEthGr = Same gender, ethnicity, and greek status





