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## Estimates and influences of reflective opposite-sex norms on alcohol use among a high-risk sample of college students: Exploring Greek-affiliation and gender effects

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### Abstract

Reflective opposite sex norms are behavior that an individual believes the opposite sex prefers them to do. The current study extends research on this recently introduced construct by examining estimates and influences of reflective norms on drinking in a large high-risk heterosexual sample of male and female college students from two universities. Both gender and Greek-affiliation served as potential statistical moderators of the reflective norms and drinking relationship. All participants ( $N = 1790$ ; 57% female) answered questions regarding the amount of alcohol they believe members of the opposite sex would like their opposite sex friends, dates, and sexual partners to drink. Participants also answered questions regarding their actual preferences for drinking levels in each of these three relationship categories. Overall, women overestimated how much men prefer their female friends and potential sexual partners to drink, whereas men overestimated how much women prefer their sexual partners to drink. Greek-affiliated males demonstrated higher reflective norms than non-Greek males across all relationship categories, and for dating partners, only Greek-affiliated males misperceived women's actual preferences. Among women however, there were no differences between reflective norms estimates or the degree of misperception as a function of Greek status. Most importantly, over and above perceived same-sex social norms, higher perceived reflective norms tended to account for greater variance in alcohol consumption for Greeks (vs. non-Greeks) and males (vs. females), particularly within the friend and sexual partner contexts. The findings highlight that potential benefits might arise if existing normative feedback interventions were augmented with reflective normative feedback designed to target the discrepancy between perceived and actual drinking preferences of the opposite sex.

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### Contributors

Justin Hummer, Joseph LaBrie, Andrew Lac, Ashley Sessoms, and Jessica Cail have each contributed significantly to, and approve of this final manuscript. Specifically, Justin Hummer designed the study, performed all analyses with Dr. LaBrie, and contributed largely to writing all sections of the manuscript. Dr. LaBrie generated the idea for the study, oversaw its production, and edited all sections. Andrew Lac drafted the Results section and created Tables and figures. Ashley Sessoms performed the literature review, drafted the Introduction and created Table 1. Jessica Cail assisted with the development of initial outlines of the manuscript and helped draft the Discussion.

### Conflict of Interest

All authors declare that they have no conflicts of interest.

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## Keywords

reflective norms; college students; alcohol; fraternity and sorority; social norms; normative feedback

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## 1. Introduction

Heavy drinking among college students persists as a serious social, academic, and health concern for both college personnel and the general public, with consequences ranging from missed classes and hangovers to damaged property, fights, sexual assaults, and even death (Hingson, Heeren, Winter, & Wechsler, 2005; Hingson, Zha, & Weitzman, 2009; Wechsler, Lee, Kuo, & Lee, 2000). Yet, despite growing publicity toward this problem and the implementation of substantial prevention and intervention efforts to help reduce problematic drinking, prevalence rates of high-risk drinking and related consequences have remained relatively stable since 1993 (Hingson et al., 2009; Johnston, O'Malley, Bachman, & Schulenberg, 2007; Nelson, Xuan, Lee, Weitzman, & Wechsler, 2009). Understandably then, researchers continually seek to identify and understand critical correlates and predictors of high-risk use.

### 1.1 Normative Influences and College Student Drinking

Individual alcohol use among college students has been shown to be influenced by other students, through direct and indirect social influence processes operating via perceptions of behavior and attitudes among an individual's reference groups (Perkins, Haines, & Rice, 2005; Borsari & Carey, 2003; Perkins, 2002). Both descriptive and injunctive norms, defined as the perceived behaviors and attitudes, respectively, of a reference group, are more strongly related to college student drinking than variables such as race, gender, year in school, fraternity/sorority membership, parental attitudes, family history of alcohol problems, alcohol outcome expectancies, and drinking motives (Neighbors, Lee, Lewis, Fossos, & Larimer, 2007; Perkins, 2002; Perkins et al., 2005). Due to such strong associations, problems arise when perceptions are not congruent with reality. Overestimations of both descriptive (the amount of alcohol consumed) and injunctive (the extent to which peers approve of alcohol use) norms are well documented among college students (Perkins et al., 2005; Perkins, 2002), and these overestimations are strongly related to an individual student's own drinking (for review see Borsari & Carey, 2003). Given this well-documented incongruence between perception and reality and its influence on drinking, it is important to identify and understand different kinds of misperceptions and their connections to risky drinking.

The current study focuses on reflective opposite sex norms, defined as "the behavior that an individual believes the opposite sex prefers them to do" (LaBrie, Cail, Hummer, Lac & Neighbors, 2009, p. 158). These perceived preferences of the opposite sex are an extension of the more typical social norms constructs widely utilized in prevention and intervention efforts to correct alcohol misperceptions on college campuses nationwide (e.g., LaBrie, Hummer, Huchting, & Neighbors, 2009; LaBrie, Hummer, Neighbors, & Pedersen, 2008; Larimer & Cronce, 2007). The concept of opposite sex reflective norms was first identified in focus group research investigating gender issues relevant to college binge drinking (Young, Morales, McCabe, Boyd, & D'Arcy, 2005). In these groups, a common response theme concerned college women's perceptions of what men consider attractive. Female participants repeatedly expressed that college men paid more attention and found it more attractive when a woman could match their level of drinking. In a quantitative analysis seeking to establish whether these perceptions accurately reflected males' perspectives, LaBrie, Cail, et al. (2009) asked a large sample of heterosexual college females three

questions to estimate the number of drinks they believed males want their female friends, dates, and sexual partners to drink (i.e., reflective norms), and compared these estimates to males' actual preferences. Findings revealed that females overestimated the amount of alcohol males want them to drink across the friend, dating, and sexual partner categories. These perceptions explained variance in women's individual drinking over and above perceived same-sex descriptive norms (considered one of the strongest known predictors of college student drinking).

An implication of these findings is the need to extend research to notable high-risk groups in the college environment, such as men and Greek-affiliated students who engage in heavy episodic drinking (4+ drinks in one sitting for women and 5+ drinks in one sitting for men; O'Malley & Johnston, 2002; Wechsler & Nelson, 2008). Heavy episodic drinking has a well-established relationship with negative consequences, impacting both the individual as well as resulting in detrimental secondhand effects on surrounding students and communities (e.g., Wechsler et al., 2002). In the interest of maximizing impact on a subset of drinkers who could most benefit from reductions in use, heavy episodic drinking has been used as an inclusion criterion in many brief alcohol intervention studies among college students (e.g., Marlatt et al, 1998; Neighbors, Larimer, & Lewis, 2004; Neighbors, Lewis, Bergstrom, & Larimer, 2006). Thus, the current study also focuses on students who report meeting the threshold for this indicator of high-risk.

## 1.2 Importance of Gender Directions

One limitation of LaBrie, Cail, et al. (2009) is that the study lacked variables focusing on males' perceptions of opposite sex preferences, and whether these estimates corresponded to females' actual preferences. As men drink at consistently more frequent and higher levels than women (Nelson et al., 2009), it is important to gauge the extent to which they might be drinking to meet perceived female demands. Moreover, for both men and women, drinking prior to sexual encounters may be based on evaluations of what their opposite sex partners want them to drink or what they think makes them more attractive. Such drinking motivated by beliefs concerning the opposite sex may produce heightened risk for deleterious sexual consequences. For example, as consumption increases, judgment and decision making abilities are impaired, potentially leading to increased risky sexual behaviors and even to sexual violence, assault, and acquaintance rape (Cooper, 2002; Abbey, 2002). Therefore, acquiring a more in-depth understanding about how reflective norms are linked to alcohol use, as a function of gender, should be of considerable importance in alcohol research.

Due to the relationship-specific nature of reflective norms and interpersonal differences in relationship goals between males and females, the same patterns of misperceptions for reflective norms may not hold across genders. Internalized gender roles constructed by society typically characterize women as more sensitive to social situations, more self-conscious, and placing greater value on interpersonal relationships than men (Gleason, 1994). Thus, women may be more attuned to and therefore more affected by the preferences of the opposite sex than their male counterparts. A primary aim of the current study involves documenting gender differences regarding reflective norms estimates and how these variables are related. Moreover, the current study will employ the same relationship categories (friend, dating partner, and sexual partner) as in the previous study (LaBrie, Cail et al., 2009). The distinction between dating partner and sexual partner is especially important, as dating may imply some romantic or sexual interest, but does not necessarily guarantee it. 'Dating partner' may mean different things to males and females but it is also typified by gender roles (e.g., Morr Serewicz & Gale, 2008), making it necessary to include a specific category of 'sexual partner' when conducting comparative analyses on reflective norms as a function of gender.

### 1.3 Greek-affiliation and Associated Risk

Among college students, membership in a fraternity or sorority, and even intended membership, has long been established as a risk-factor for heavy drinking and serious alcohol-related consequences (Cashin, Presley, & Meilman, 1998; LaBrie et al., 2007; Park, Sher, & Krull, 2008). Greek-affiliated students as compared to non-Greeks more frequently endorse alcohol as a way to enhance social activity, facilitate bonding, and make women appear sexier (Alva, 1998). Further, perceived norms play a pivotal role in sustaining risky drinking within the Greek system (Barry, 2007; Borsari & Carey, 2003), and both descriptive and injunctive peer norms prospectively mediate the relationship between Greek status and heavy alcohol consumption (Sher, Bartholow, & Nanda, 2001). Greek students tend to perceive that other Greeks' drinking levels are higher than typical student drinking, and are more accurate in estimating the typical drinking of fellow Greek students (Borsari & Carey, 2003). Given the increased risk associated with Greek-affiliation, it is necessary for research to continue isolating important normative determinants of alcohol use by Greeks that can augment existing prevention and intervention efforts. Due to the strong normative influence widespread within the Greek drinking culture, reflective norms may prove to be an important risk factor of drinking.

### 1.4 Current Study & Hypotheses

The current study focused on the reflective drinking norms of a large representative sample of undergraduate students who reported drinking at risky levels. Reflective perceptions of opposite sex normative drinking preferences were assessed by asking students three questions regarding the amount of alcohol they believe a member of the opposite sex would like his/her opposite sex friends, dates, and sexual partners to drink. For example, males provided responses to how much they think women prefer their male friends to drink. Accuracy of these perceptions was assessed by comparing them to the actual opposite sex normative drinking preferences for each of the three relationship contexts (e.g., how much women actually want their male friends to drink). We hypothesized that males and females would overestimate the amount of alcohol that the opposite sex prefers them to drink across relationship type. This trend was also expected to be present for both Greek and non-Greek students.

We were also interested in the extent to which reflective norms were linked to personal levels of drinking. We hypothesized that reflective norms should positively predict individual drinking, over and above descriptive same-sex norms, considered in previous research to be one of the most powerful predictors of college student drinking. We further hypothesized that Greek status would moderate this relationship, such that reflective norms would be more highly connected with drinking in Greek compared to non-Greek students. We additionally examined gender as a potential moderator of the reflective norms and drinking linkage. Based on previous reflective norms research (LaBrie, Cail et al., 2009) and other studies indicating the relatively robust effects of interpersonal influences on women's drinking, we hypothesized that opposite sex reflective norms should be more misperceived by women and also more strongly related to women's, as opposed to men's, alcohol use. Finally, social norms research often simultaneously considers Greek status, gender, and perceived norms in models predicting alcohol-related outcomes (e.g., LaBrie, Hummer, Neighbors, & Larimer, 2010; LaBrie et al., 2008; Neighbors et al., 2010), which has revealed important nuances for how and whom normative feedback should be applied (e.g., Larimer et al., 2011). Thus, three-way interactions between reflective norms, Greek status, and gender were evaluated to predict drinking, and therefore anticipated to provide further insight into how reflective norms operate depending on the moderator.

## 2. Materials and Methods

### 2.1 Procedures and Participants

Recruitment and data collection occurred at two U.S. west-coast campuses, one a large public university and the other a private mid-sized university. Local IRBs at each site approved the current study, which was part of a larger longitudinal intervention study. A random sample of 11,069 undergraduate students stratified across class year and equally portioned from both universities was invited to complete a Web-based screening survey approximately one month into the Fall 2008 term. Of these, 4,984 (45.0%) completed the screening survey, and all students meeting inclusion criteria (five/four or more drinks in one occasion for men/women;  $n = 2,027$ ; 40.7%) were immediately invited to the larger study and later directed to the baseline survey. Of those invited, 1,827 (90.1%) completed the baseline survey. For the purpose of the study and because questions regarding preferences for dating and sexual partners referred to members of the opposite sex, only heterosexual students ( $n = 1790$ ; 98.0%) were included in the final sample. Minor discrepancies in degrees of freedom are due to missing data. Recruitment rates were comparable to other large-scale studies among this population (e.g., Marlatt et al., 1998; McCabe, Boyd, Couper, Crawford, & D'Arcy, 2002; Neighbors et al., 2007). The combined assessments took approximately one hour to complete and participants received \$40 for completing the assessments.

Participants ranged in age from 18 to 24 years ( $M[SD] = 19.92 [1.33]$ ). Ethnic composition of the sample was 76.1% Caucasian & 23.9% Asian. Participants were also asked whether their birth sex was male or female and whether they were currently a member of a fraternity or sorority (i.e., Greek-affiliation). The sample was revealed to be primarily female (57.4%) and of non-Greek affiliation (69.7%). Participants were informed that their responses were confidential and would not be connected to their name or e-mail address.

### 2.2 Measures

Prior to answering questions related to drinking behavior, a standard drink was defined as a drink containing one-half ounce of ethyl alcohol (Ksir, Hart, & Ray, 2006) — one 12 oz. beer, one 4 oz. glass of wine, or one 1.25 oz. shot of 80 Proof liquor. Pictures of standard drinks accompanied these descriptions.

#### 2.2.1 Reflective perceptions of opposite sex normative drinking preferences—

Because the current study sought to extend prior research that focused solely on female's reflective norms, all reflective norms constructs reflected identical constructs and response options as the original study (LaBrie, Cail, et al., 2009). Male and female participants responded to three questions assessing their perceptions of opposite sex drinking preferences. The first question assessed the perceived level of drinking preferred by typical college males or females for their opposite sex friends, while the second and third questions assessed the perceived level of drinking preferred by typical college males or females for more romantic types of relationships (dating partners and sexual partners).

For example, male participants began by answering an open-ended question to assess their perceptions about the amount females prefer their male friends to drink: "How many drinks (on average) do you think a typical college female would like her male friends to consume during a typical drinking occasion?" This question was also asked of females, regarding their perceptions about the amount males prefer their female friends to drink.

Similarly, participants were then asked to answer two questions referring to perceived preferences of the opposite sex regarding drinking behavior of dating partners and sexual partners. Thus, males were asked: "Which of these do you think college women would most



likely want to date?” and “Which of these do you think college women find the most sexually attractive?” Response options for both questions were as follows: 0 (*A man who never drinks any alcohol*), 1 (*A man who drinks 1 or 2 drinks when he drinks*), 2 (*A man who drinks 3 or 4 drinks when he drinks*), 3 (*A man who drinks 5 to 8 drinks when he drinks*), and 4 (*A man who drinks 9 or more drinks when he drinks*). These questions were also asked of females, regarding their perceptions about the amount males prefer their female sexual and dating partners to drink.

**2.2.2 Actual opposite sex normative drinking preferences**—In order to assess participants’ actual preferences, they first answered questions indicating the amount they actually prefer their opposite sex friends to drink. For example, females were asked the open-ended question: “How many drinks (on average) would you like your male friends to consume during a typical drinking occasion?” They were also asked about their preferences for drinking behavior of male dating partners and sexual partners: “Which of these would you most likely want to date?” and “Which of these do you find the most sexually attractive?” Response options for actual preferences were identical to the options for the corresponding reflective perceptions. All questions were repeated to also assess males’ actual preferences.

**2.2.3 Individual alcohol use**—Quantity of alcohol consumption was assessed using the Daily Drinking Questionnaire (DDQ). Participants were asked, “Consider a typical week in the last month. How much alcohol, on average (measured in number of drinks), did you drink on each day of a typical week?” Participants responded by reporting the typical number of drinks consumed on each day of the week. Weekly drinking was calculated by summing participants’ responses for each day of the week. The DDQ has been used in previous studies of college student drinking and has demonstrated good validity (Larimer et al., 2001; Marlatt et al., 1998).

**2.2.4 Perceived same-sex norms**—Perceived same-sex norms for weekly quantity of alcohol consumption was assessed using the Drinking Norms Rating Form (Baer, Stacy, & Larimer, 1991), modeled directly after the DDQ. The perceived quantity norm was assessed by asking participants, “How many drinks, on average, does a typical (male/female) student at your university drink on each day of a typical week?” Participants were given the question that corresponded to their gender. The perceived same-sex norm variable was scored by summing the perceived number of drinks consumed for each day of the week.

### 3. Results

#### 3.1 Data Analysis

The distributional properties of variables indicated that skewness levels were within reasonable limits ( $< 2.0$ ). Initial analyses examined group-based mean differences via independent *t*-tests, particularly the extent that participants’ reflective normative preferences overestimated or underestimated the actual preferences of the opposite sex. Correlations between the variables were then inspected. This was followed by the estimation of three separate hierarchical multiple regression models (for friends, dating partners, and sexual partners) to predict individual drinks consumed per week. The model regarding reflective normative preferences for friends was specified as follows: In Step 1, to rule out the statistical contribution associated with perceived same-sex norms, this variable was entered as a covariate. Step 2 consisted of the main effects of reflective norms for friends, respondent sex (1 = *male* and 0 = *female*), and Greek status (1 = *Greek*, 0 = *Non-Greek*); All possible two-way interactions involving the three main effects were estimated in Step 3. The overall three-way interaction was computed in Step 4. A similar four-step specification of

the regression analysis was used to estimate the model regarding reflective normative preferences for dating partners and also the model regarding reflective normative preferences for sexual partners.

Regression models were estimated, interpreted, and graphed according to established procedures (Aiken & West, 1991). None of the models produced problems associated with multicollinearity, as the variance inflation factor (VIF) for all predictors were below 2.0. In each regression model, only the highest-order interaction term determined to be significant was elaborated upon, as interpretation of two-way interaction effects are qualified by their overarching three-way interaction. Accordingly, the highest-order interaction effect attaining statistical significance was graphed, controlling for all other predictors. In interactions found to be significant, their standardized simple slopes were evaluated to determine if these slopes were significantly different from a horizontal slope of zero (Dawson & Richter 2006).

### 3.2 Mean Differences

Mean scores for drinks per week, perceived same-sex norms, and the three measures assessing reflective normative preferences and actual preference are presented in Table 1 for males and females. Both overestimation and underestimation of actual drinking preferences of the opposite sex was evidenced on several variables. Males' reflective norms for female friends was significantly lower than females' actual preference,  $t(1756) = 5.58, p < .001$ , but males' reflective norms for sexual partners was significantly higher than females' actual preference,  $t(1758) = 5.88, p < .001$ . In contrast, females' reflective norms were significantly higher than the males' actual preferences for friends,  $t(1757) = 10.78, p < .001$ , and sexual partners,  $t(1758) = 6.28, p < .001$ . The mean score of reflective norms for dating partners was not significantly different from the actual preference reported by the opposite sex, for either males,  $t(1758) = 1.66, p = .10$ , or females,  $t(1758) = 1.21, p = .23$ .

Additional analyses assessed reflective norms for males and females separately as a function of Greek status (Table 1). In both the male and female samples, after separation into Greek and non-Greek participants, mean differences between self-reported reflective normative preferences and actual opposite sex preferences also emerged (see Table 1). Furthermore, Greek males (vs. non-Greek males) reported significantly higher drinks per week,  $t(761) = 10.67, p < .001$ , and higher scores on reflective norms for friends,  $t(751) = 2.70, p = .007$ , dating partners,  $t(752) = 2.52, p = .012$ , and sexual partners,  $t(752) = 2.69, p = .007$ . Greek females (vs. non-Greek females), however, reported significantly higher scores on drinks per week,  $t(1023) = 8.33, p < .001$ , and perceived same-sex norms,  $t(1005) = 2.10, p = .04$ , but none of the reflective norms for friends,  $t(1004) = .17, p = .86$ , dating partners,  $t(1004) = .31, p = .76$ , or sexual partners,  $t(1004) = .24, p = .81$ , were discovered to be significantly different.

### 3.3 Correlations

Each of the three types of reflective norms significantly correlated with drinks per week (Table 2). Reflective norms for dating partners and reflective norms for sexual partners were more strongly correlated with each other than with reflective norms for friends, as the first two variables conceptually represented more intimate interpersonal relations.

### 3.4 Reflective Normative Preference for Friends Model

In the model assessing reflective normative preference for friends, all predictors were found to significantly account for variance in drinks per week (Table 3): perceived same-sex norms, reflective norms for friends, sex, Greek-affiliation, reflective norms for friends  $\times$  sex, reflective norms for friends  $\times$  Greek, sex  $\times$  Greek, and reflective norms for friends  $\times$  sex  $\times$  Greek. The three-way interaction is depicted in Figure 1. Specifically, among Greek-



affiliated students, the positive connection between reflective norms for friends and drinks per week was stronger for males (simple slope  $\beta = .47, p < .001$ ) than females (simple slope  $\beta = .16, p < .001$ ),  $t = 4.87, p < .001$ . Among non-Greek students, although the slopes were significant, the predictive relationship of reflective norms on elevating drinks per week was not as pronounced for males (simple slope  $\beta = .14, p < .001$ ) and females (simple slope  $\beta = .07, p = .04$ ), and both slopes were not systematically different,  $t = 0.56, p = .58$ .

### 3.5 Reflective Normative Preference for Dating Partners Model

In the regression model for reflective norms for dating partners, the following predictors accounted for a significant proportion of the variance in drinks per week (Table 4): perceived same-sex norms, reflective norms for dating partners, sex, Greek status, reflective norms for dating partners  $\times$  Greek, and sex  $\times$  Greek. As the three-way interaction was not significant, the significant two-way interactions were interpreted instead. The reflective norms for dating partners  $\times$  Greek interaction (see Figure 2) shows that the positive link between reflective norms for dating partners and drinks per week was more robust for Greeks (simple slope  $\beta = .21, p < .001$ ) than non-Greeks (simple slope  $\beta = .08, p = .002$ ), and that these two slopes systematically differed in magnitude because the two-way interaction was significant. A sex  $\times$  Greek interaction also was significant (not graphed due to space limitations), which showed that for males, Greeks were more likely to drink than non-Greeks (simple slope  $\beta = .39, p < .001$ ); and that for females, Greeks were significantly more likely to consume alcohol than non-Greeks (simple slope  $\beta = .17, p < .001$ ). The significance of this two-way interaction provided evidence indicating that both these slopes systematically differed as a function of gender.

### 3.5 Reflective Normative Preference for Sexual Partners Model

In the reflective norms for sexual partners model predicting drinks per week, the following predictors achieved statistical significance (Table 5): perceived same-sex norms, reflective norms for sexual partners, sex, Greek-affiliation, reflective norms for sexual partners  $\times$  Greek, sex  $\times$  Greek, and reflective norms for sexual partners  $\times$  sex  $\times$  Greek. The significant three-way interaction is illustrated in Figure 3. Among the Greek sample, the positive association between reflective norms for sexual partners and drinks per week was stronger for males (simple slope  $\beta = .37, p < .001$ ) than females ( $\beta = .16, p < .001$ ),  $t = 2.55$ , which were significantly different  $p = .011$ . In contrast, for the non-Greek sample, the positive association between reflective norms for sexual partners and drinks per week was not only relatively weak for both males ( $\beta = .08, p = .06$ ) and females ( $\beta = .07, p = .02$ ), but also not significantly different as a function of gender,  $t = .52, p = .60$ .

## 4. Discussion

The current study sought to confirm and extend previous work on opposite sex reflective norms that focused solely on women (LaBrie, Cail et al., 2009), by examining estimates and influences of reflective norms within a heavier drinking sample, and as a function of sex and Greek-affiliated status. Overall and consistent with the previous research, males drank more than females, and Greeks drank more than non-Greeks. Both genders perceived that the typical same-sex student drinks more than they themselves do. A pattern of overestimation and underestimation of actual drinking preferences of the opposite sex was evidenced and varied as a function of Greek status and gender. All three types of reflective norms were significantly correlated with drinks per week for both men and women and most importantly, perceptions of these preferences predicted individual drinking over and above sex, Greek status, and perceived same-sex norms. As these variables are three of the strongest known predictors of alcohol consumption within the college environment, our

results provide further support for the influence of reflective norms in a high-risk drinking sample.

Tests of mean differences showed that Greek and non-Greek affiliated women overestimated the number of drinks they thought men would prefer them to drink, with no significant differences in magnitude of misperception as a function of Greek status. Overestimations were present within the context of opposite sex friendships and sexual partnerships; however this was not the case within the dating context. With respect to men's actual preferences for dating partners, women accurately perceived how much alcohol men prefer their dating partners to drink. This finding stands in contrast to our previous research with a lighter-drinking sample of women (LaBrie, Cail et al., 2009) who significantly overestimated the number of drinks that men actually preferred their dating partners to consume. It is possible that heavier-drinking females such as those found in our current study tend to date heavier-drinking males, thus selecting a partner who engages in drinking more often than typical males, and shows a greater preference for women who themselves drink more. This additional focus on alcohol consumption as part of the dating partner selection process might account for the accuracy in women's perceptions of men's preferences for dating partners.

Males (both Greek and non-Greek) also misperceived the amount of alcohol the opposite sex prefers them to drink. Similar to women, men overestimated the amount that women found sexually attractive for men to drink. Although there was no overall difference between perceptions and actual preference for dating partners, there was a systematic difference as a function of Greek status. For dating partners, only Greek-affiliated males misperceived women's actual preferences. That is, fraternity members overestimated the amount of alcohol they thought women would most likely want a dating partner to consume. Men significantly *underestimated* how much women prefer their male friends to drink on average. In this comparison though, Greek males had the smaller misperception, compared to non-Greek males. One possible explanation for these underestimations may concern the level of familiarity and the dynamic found in male and female friendships. Female friends may feel more comfortable in offering their critical opinions about their male friends' drinking behaviors, particularly if they have been friends for an extended period of time. For example, females may be more apt to comment on how they feel their male friends may have drunk "too much one night" or "aren't as much fun" when they drink heavily, whereas females in dating or sexual relationships might not be as comfortable offering up their opinions or preferences on the matter.

Further, the three regression models provided important insights into the extent that estimates of opposite-sex preferences influence individual drinking behavior. Reflective norms of friends, dating partners, and potential sexual partners all predicted drinking over and above sex, Greek status, and perceived same-sex norms. Moreover, three-way interactions for the friend and sexual partner categories revealed that the level of reflective normative influence varied as a function of sex and Greek status. That is, the reflective norms influence was stronger in men than women, and considerably more so in Greek-affiliated students than non-Greeks. It is important to note that, regardless of the accuracy of their normative perceptions, reflective norms are uniquely positively associated with drinking in high-risk college students, a point which provides future researchers with a useful indicator of risk.

#### 4.1 Implications

Men *underestimated* the preferences of women in the friend category. As this was the first study on reflective norms to be collected from a male sample, it is unclear whether a lighter-drinking sample of men would also underestimate preferences of women in the friendship category. Alternatively, and perhaps concomitantly, heavier-drinking females may actually

prefer more drinking in men. Thus, these results suggest that interventions seeking to correct heavier-drinking males' reflective normative misperceptions of women's preferences may be counterproductive at this time. As the friend context is nonetheless important due to men likely having more female friends than romantic interests, it may be more beneficial to focus interventions on reducing the importance of women's preferences as a motivator for men's drinking. Secondly, the largest documented overestimation for men was regarding how many drinks college women actually find the most sexually attractive for men to drink. A strong prognostic effect of reflective norms for potential sexual partners was also found in males, particularly those who belonged to a fraternity. Taken together, these findings highlight the potential benefits associated with implementing reflective normative reeducation campaigns among male Greek students, particularly focused on delivering reflective normative feedback highlighting the discrepancy between perceived and actual drinking preferences of potential sexual partners. Normative feedback could be delivered independently or conjointly with same-sex normative feedback, which is one of the most widely used harm-reduction techniques currently employed at institutes of higher education in the U.S. (Wechsler et al., 2000).

For women, the current findings suggests that interventions that seek to correct women's misperceptions of male preferences could potentially prove fruitful within heavier drinking groups. However, while women did overestimate the preferences of their male friends and potential sexual partners, it is important for future experimental research to determine whether these variables causally impact personal levels of drinking. Especially given that a woman would likely have more male friends than dating partners, focusing on this area of social influence would seem an efficient target for intervention.

Educating college-aged men and women about normative misperceptions regarding preferences for drinking in sexual contexts may offer considerable risk-reduction benefits. The current findings revealed that reflective norms for sexual partners were strongly related to individual drinking. This is problematic, as women may be drinking to risky intoxication levels and placing themselves in situations that increase the likelihood for regretted sexual incidents and sexual consequences based on (inaccurate) perceived demands of their male counterparts. Males may also be drinking at higher levels within this sexual relationship category due to misperceived normative preferences. This is similar to how sexual-based alcohol expectancies (i.e., sexual disinhibition, sexual opportunities, sexual pleasure, interpersonal closeness) may predispose sexually active students to heavier drinking and more frequent intoxication (Carey, 1995; Thombs, Wolcott, & Farkash, 1997). Attitudes and perceptions about sexual activity have become increasingly more liberal and decreasingly less fearful through college (i.e., fear of pregnancy, STIs, negative societal labels; Gilmartin, 2006). Yet, as indicated earlier, misperceptions of sexual cues could lead to sexual violence, assault, or acquaintance rape (Cooper, 2002; Abbey, 2002). Research also consistently shows that heavy drinking plays a facilitative role in sexual behavior and assaults (see Abbey, Saenz, & Buck, 2005; Cooper, 2002), yet alcohol is rarely targeted or mentioned in college sexual assault prevention programs (Bachar & Koss, 2001), which have shown limited efficacy in reducing sexual victimization (for reviews see Anderson & Whitson, 2005; Breitenbecher, 2000). A normative reeducation program aimed at correcting misperceptions regarding drinking preferences in sexual contexts has theoretical potential to decrease one's overall alcohol consumption and thereby reduce risky sexual situations and negative sexual consequences. While research has yet to demonstrate whether providing accurate reflective norms feedback to college students would curtail risky drinking, the idea is worthy of future exploration. On a similar note, using normative reeducation to correct inaccurate reflective norms may also benefit other health behavior interventions for women. For example, a large body of evidence has documented conceptually and functionally

similar misperceptions regarding body image (Bergstrom & Neighbors, 2006; Bergstrom, Neighbors, & Lewis, 2004). This is a potentially fruitful avenue for future research.

#### 4.2 Limitations and Future Directions

This study has several limitations. First, reflective norms items were generated by the researchers. While previous research has demonstrated a relationship between these items and drinking behavior (LaBrie, Cail, et al., 2009) future research should work toward establishing a standardized assessment with psychometric evaluation regarding construct validity. Moreover, the questions assumed that participants have a stated preference for how much members of the opposite sex drink and that other students are aware of this preference. Future studies utilizing these items would benefit from including response options that are more sensitive toward whether a preference exists. On a related note, the wording of the items to assess the reflective norms for friends is different to that used to assess the reflective norms of dating and sexual partners. The latter have a decidedly stronger focus on the perceived sexual attractiveness of different levels of drinking. While the attractiveness of a certain level of drinking can be viewed as a proxy to a stated preference, these items could be assessed in the same format as reflective norms for friends, using open-ended response options and explicitly asking the number of drinks that members of the opposite sex would prefer their dating and sexual partners to consume during a drinking occasion.

Second, the current study was designed to focus on heavier drinking students' perceptions, but the actual normative preferences were also collected from this sample. Thus, mean preferences may be inflated compared to the general student population, possibly resulting in less sensitivity with regards to the degree of misperception. Future research may wish to compare reflective norms of various subpopulations to actual preferences of the whole population of interest. Despite the important findings revealed in the current study, the use of population norms for comparative purposes could result in more meaningful conclusions.

Third, the current study expanded on previous research regarding reflective norms estimates and subsequent influence of those estimates, by documenting differences as a function of Greek status for each gender. However, Greek organizations are not a feature in other country's university systems, so the results regarding the moderating role of Greek status are unlikely to generalize beyond U.S. universities. Moreover, the normative reference group for Greeks was still at the level of typical student. Given the strong prognostic influence of this more distal reference group, future studies should begin to investigate reflective norms of more proximal and salient reference groups such as Greek-affiliated organizations (i.e., typical fraternity or sorority member), Greek residence-type (i.e., fraternity/sorority house or in own apartment), student-athletes (i.e., typical same-sex athlete at one's school), and/or residence hall students (i.e., typical same-sex resident on one's floor). Moreover, expanding the opposite-sex referent to include a same-sex reference group could provide a better understanding of how reflective norms operate, both for members of the same gender as well as for homosexual relationships (i.e., dating and sexual partners). Research suggests that misperceptions of proximal (and potentially more salient) reference groups are more likely to influence drinking behavior than misperceptions of more distal reference groups (e.g., Borsari & Carey, 2003; Larimer et al., 2009). On a similar note, a critical determinant of the influence of a particular group is the extent to which one identifies with the group (Ellemers, Spears, & Doosje, 2002). While identification with a group is likely to increase along with proximity, future research should specifically measure social or group identity as a potential moderator of the reflective norms/behavior link.

Finally, this study employed a cross-sectional design. Thus, although conceptually tenable, the temporal ordering of reflective norms preceding drinking cannot be fully determined in the current study. Future research would benefit by longitudinally assessing reflective norms

constructs and their relationship to alcohol consumption throughout a student's college tenure.

### 4.3 Conclusion

The current study advances our understanding of the recently identified construct known as reflective opposite-sex norms; defined as “the behavior that an individual believes the opposite sex prefers them to do” (LaBrie, Cail, et al., 2009, p. 158). Overall, women overestimated how much men prefer their female friends and potential sexual partners to drink, while men overestimated how much women prefer their sexual partners to drink. Furthermore, the perceptual increase from low to high reflective norms was associated with increased alcohol consumption, especially for Greeks and males. The fact that reflective norms are related to alcohol use in both male and female college students, and that this relationship is present even when controlling for same-sex norms suggests that it may be imperative to incorporate these normative perceptions into social norms interventions. Further, as the path from reflective norms to drinking risk was stronger in certain groups of students suggests that incorporating this concept into education, prevention, and intervention efforts needs to be tailored to the group of interest.

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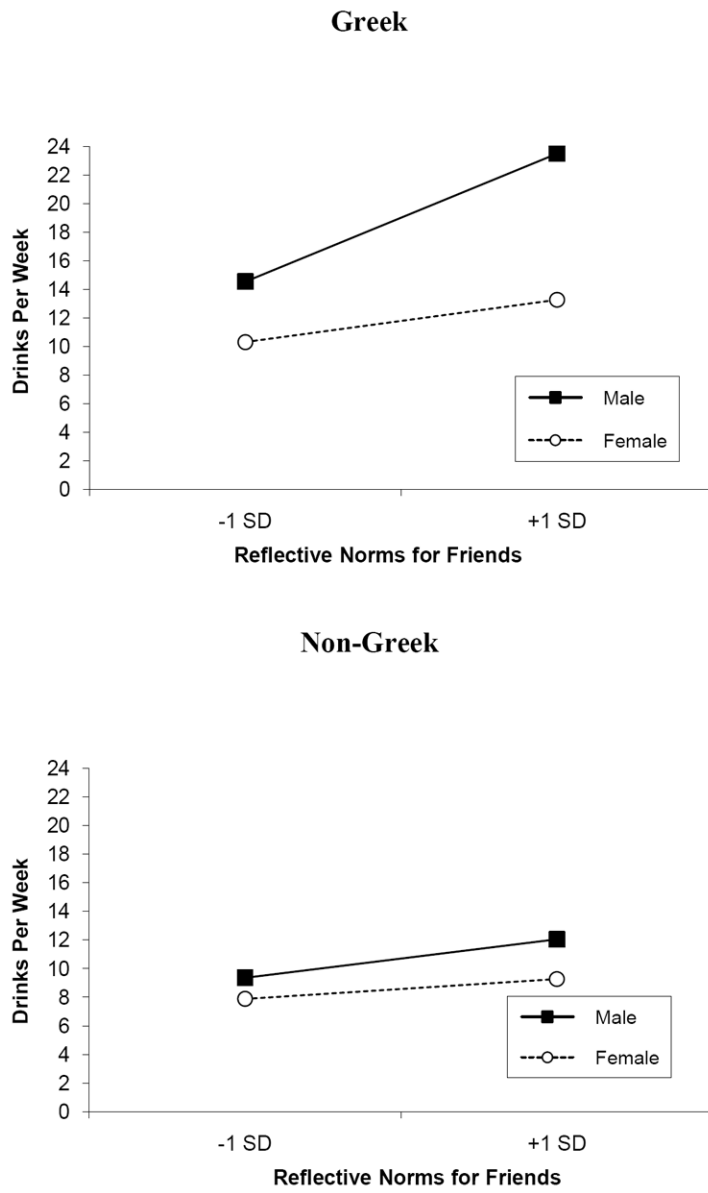


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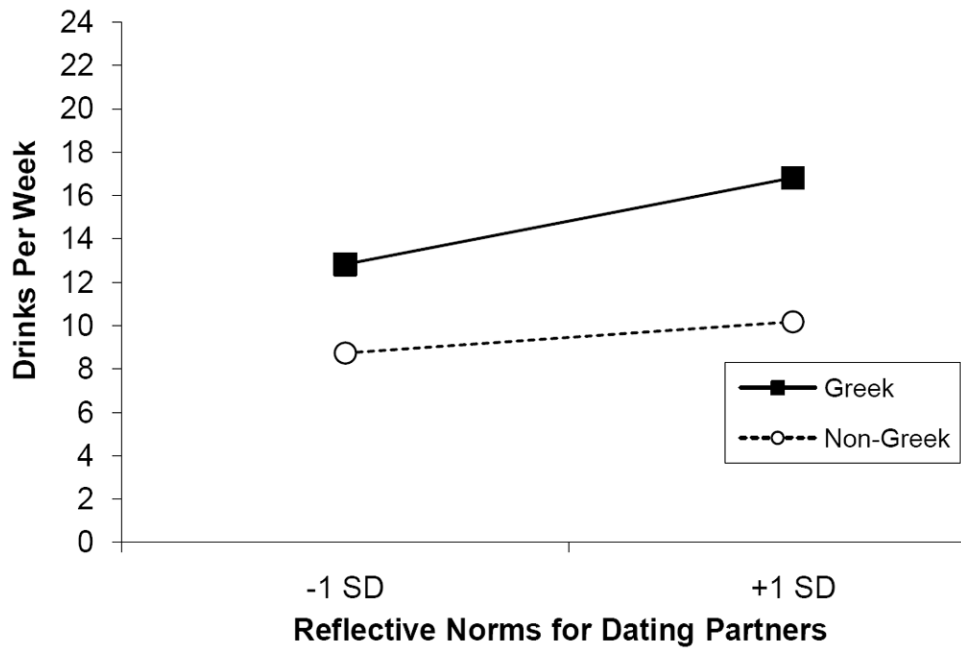
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### Research Highlights

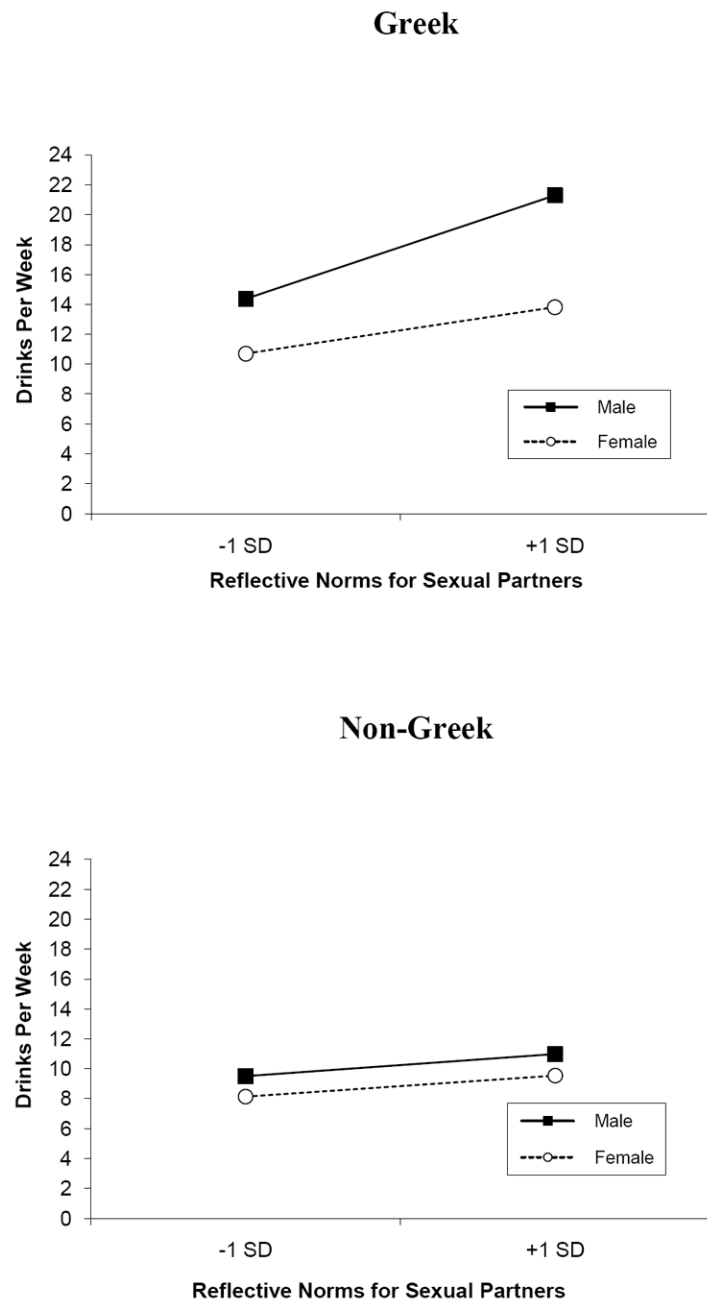
1. Examines reflective norms as predictors of alcohol use among college students.
2. Perceived drinking preferences of opposite sex friends, dates, or sexual partners.
3. Estimate accuracy varied as a function of gender and Greek-affiliation status.
4. Reflective norms associated with alcohol use over perceived same-sex norms.
5. Benefits of using reflective normative feedback as intervention strategy.



**Figure 1.** Reflective normative preference for friends  $\times$  gender  $\times$  Greek predicting drinks per week.



**Figure 2.** Reflective normative preference for dating partners × Greek predicting drinks per week



**Figure 3.** Reflective normative preference for sexual partners  $\times$  gender  $\times$  Greek predicting drinks per week.



Table 1

Descriptives and Tests of Means Differences (N = 1790)

Males	Overall Males (N = 763)		Greek Males (n = 220)		Non-Greek Males (n = 543)		Actual Preference of Females (N = 1027)	
	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)	
Drinks Per Week	14.39 (11.54)	20.92 (14.18)	11.74 (9.03)***					
Perceived Same Sex Norms	18.43 (10.88)	19.20 (11.21)	18.12 (10.74)					
Reflective Normative Preference								
Reflective Norms for Friends	5.26 (2.34) <sup>a</sup>	5.62 (2.19) <sup>b</sup>	5.11 (2.38) <sup>a**</sup>	5.91 (2.14)				
Reflective Norms for Dating Partners	1.99 (0.90)	2.12 (0.88) <sup>a</sup>	1.93 (0.90) *	1.92 (0.81)				
Reflective Norms for Sexual Partners	2.34 (0.85) <sup>a</sup>	2.47 (0.79) <sup>a</sup>	2.29 (0.86) <sup>a**</sup>	2.11 (0.81)				
Actual Preference of Males (N = 763)								
Females	Overall Females (N = 1027)		Greek Females (n = 322)		Non-Greek Females (n = 705)		Actual Preference of Males (N = 763)	
	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)	
Drinks Per Week	8.65 (6.61)	11.11 (7.29)	7.53 (5.95)***					
Perceived Same Sex Norms	11.60 (6.04)	12.19 (5.85)	11.33 (6.11) *					
Reflective Normative Preference								
Reflective Norms for Friends	5.74 (2.37) <sup>a</sup>	5.75 (2.07) <sup>a</sup>	5.73 (2.50) <sup>a</sup>	4.52 (2.28)				
Reflective Norms for Dating Partners	1.65 (0.67)	1.65 (0.64)	1.64 (0.68)	1.69 (0.79)				
Reflective Norms for Sexual Partners	2.07 (0.75) <sup>a</sup>	2.06 (0.70) <sup>a</sup>	2.07 (0.77) <sup>a</sup>	1.84 (0.75)				

Note. Drinks per week, perceived same sex norms, and reflective norms for friends are on open-ended scales. Reflective norms for dating partners and reflective norms for sexual partners are on a Likert-type scale: 0 = *never drinks*, 1 = *1 or 2 drinks*, 2 = *3 or 4 drinks*, 3 = *5-8 drinks*, 4 = *9 or more drinks*.

<sup>a</sup> = significant difference between reflective normative preference and actual preference of opposite sex at  $p < .001$ .

<sup>b</sup> = significant difference between reflective normative preference and actual preference of opposite sex at  $p < .05$ .

\*  $p < .05$ ,

\*\*  $p < .01$ ,

\*\*\*  $p < .001$ , significant difference between Greek and Non-Greek within each gender.

**Table 2**

Correlation Matrix for Male and Female Samples

Variable	1	2	3	4	5	6
1. Drinks Per Week	--	.44***	.24***	.22***	.21***	.25***
2. Perceived Same Sex Norms	.39***	--	.34***	.23***	.24***	.07*
3. Reflective Norms for Friends	.33***	.37***	--	.26***	.33***	.00
4. Reflective Norms for Dating Partners	.21***	.19***	.39***	--	.54***	.01
5. Reflective Norms for Sexual Partners	.25***	.25***	.39***	.70***	--	-.01
6. Greek	.36***	.05	.10**	.09*	.09*	--

Note. Values below diagonal are from male sample; values above diagonal are from female sample. Greek (1 = Greek, 0 = Non-Greek).

\*  $p < .05$ .

\*\*  $p < .01$ .

\*\*\*  $p < .001$ .

Table 3

Hierarchical Multiple Regression of Reflective Normative Preference for Friends  $\times$  Gender  $\times$  Greek Status Predicting Drinks Per Week (Controlling for Perceived Same Sex Norms)

Predictor	At Step		Final Model	
	R <sup>2</sup> change	R <sup>2</sup> total	B	SE $\beta$
Step 1: Covariate	.22 <sup>***</sup>	.22 <sup>***</sup>		
Perceived Same Sex Norms			3.14	0.21 .33 <sup>***</sup>
Step 2: Main Effects	.11 <sup>***</sup>	.33 <sup>***</sup>		
Reflective Norms for Friends			1.51	0.20 .16 <sup>***</sup>
Sex			1.82	0.20 .19 <sup>***</sup>
Greek			2.47	0.19 .26 <sup>***</sup>
Step 3: Two-Way Interactions	.02 <sup>***</sup>	.35 <sup>***</sup>		
Reflective Norms for Friends $\times$ Sex			0.67	0.19 .07 <sup>***</sup>
Reflective Norms for Friends $\times$ Greek			0.82	0.20 .08 <sup>***</sup>
Sex $\times$ Greek			1.16	0.19 .12 <sup>***</sup>
Step 4: Three-Way Interaction	.01 <sup>**</sup>	.36 <sup>***</sup>		
Reflective Norms for Friends $\times$ Sex $\times$ Greek			0.53	0.20 .05 <sup>**</sup>

Note. Sex (1 = *Male*, 0 = *Female*); Greek (1 = *Greek*, 0 = *Non-Greek*).

\*  $p < .05$ .

\*\*  $p < .01$ .

\*\*\*  $p < .001$ .

**Table 4**  
 Hierarchical Multiple Regression of Reflective Normative Preference for Dating Partners  $\times$  Gender  $\times$  Greek Status Predicting Drinks Per Week,  
 (Controlling for Perceived Same Sex Norms)

Predictor	At Step		Final Model	
	R <sup>2</sup> change	R <sup>2</sup> total	B	SE $\beta$
Model: Dating Partners				
Step 1: Covariate	.22***	.22***		
Perceived Same Sex Norms			3.53	0.20 .37***
Step 2: Main Effects	.10***	.32***		
Reflective Norms for Dating Partners			1.10	0.20 .12***
Sex			1.30	0.20 .14***
Greek			2.46	0.19 .26***
Step 3: Two-Way Interactions	.02***	.34***		
Reflective Norms for Dating Partners $\times$ Sex			0.07	0.19 .01
Reflective Norms for Dating Partners $\times$ Greek			0.59	0.20 .06**
Sex $\times$ Greek			1.02	0.19 .11***
Step 4: Three-Way Interaction	.00	.34***		
Reflective Norms for Dating Partners $\times$ Sex $\times$ Greek			0.07	0.19 .01

Note. Sex (1 = Male, 0 = Female); Greek (1 = Greek, 0 = Non-Greek).

\*  $p < .05$ .

\*\*  $p < .01$ .

\*\*\*  $p < .001$ .

Table 5

Hierarchical Multiple Regression of Reflective Normative Preference for Sexual Partners  $\times$  Gender  $\times$  Greek Status Predicting Drinks Per Week, (Controlling for Perceived Same Sex Norms)

Predictor	At Step		Final Model	
	R <sup>2</sup> change	R <sup>2</sup> total	B	SE $\beta$
Model: Sexual Partners				
Step 1: Covariate	.22***	.22***		
Perceived Same Sex Norms			3.43	0.21 .36***
Step 2: Main Effects	.10***	.32***		
Reflective Norms for Sexual Partners			1.22	0.20 .13***
Sex			1.32	0.20 .14***
Greek			2.38	0.19 .25***
Step 3: Two-Way Interactions	.02***	.34***		
Reflective Norms for Sexual Partners $\times$ Sex			0.30	0.19 .03
Reflective Norms for Sexual Partners $\times$ Greek			0.76	0.20 .08***
Sex $\times$ Greek			0.95	0.19 .10***
Step 4: Three-Way Interaction	.01*	.35***		
Reflective Norms for Sexual Partners $\times$ Sex $\times$ Greek			0.43	0.19 .05*

Note. Sex (1 = Male, 0 = Female); Greek (1 = Greek, 0 = Non-Greek).

\*  $p < .05$ .

\*\*  $p < .01$ .

\*\*\*  $p < .001$ .