

The relationship between social identity, normative information, and college student drinking

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The role of peer influence has long been recognized as important in the drinking decisions and behaviors of young people. Specifying the mechanisms behind these relationships, however, remains relatively underdeveloped. In this study we examine the moderating influence of group identity on the relationship between injunctive norms and drinking behavior. A total of 620 male and female undergraduate students completed an Internet questionnaire comprised of social identity, injunctive norms (perceptions of others' approval of their heavy drinking), and alcohol consumption measures (drinks per occasion). Three separate hierarchical regression models were run examining the relationship between social identity, injunctive norms, and alcohol consumption for three reference groups: friends, peers, and fraternity/sorority members, controlling for participant gender and race/ethnicity. Stronger identification with a reference group was associated with heavier drinking for all three models. Participants' perceptions of their friends' acceptability of their heavy drinking was positively associated with alcohol consumption; however, the injunctive norms term was not significant for the models examining peers or fraternity/sorority member reference groups. In each model, significant two-way interaction terms representing the cross-product of the social identity and injunctive norms indices indicated that among respondents who identified strongly with a reference group, perceptions of heavy drinking acceptability were positively associated with greater alcohol consumption. These results have implications for norms-focused interventions that fail to account for varying identification with different social groups.

Keywords: Alcohol consumption; College students; Social identity; Social norms

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Alcohol use by college students and its associated risks are well documented (Hanson, 1974, 1977; Johnston, O'Malley, & Bachman, 1999; O'Malley & Johnston, 2002; Perkins, 2002a; Schulenberg & Maggs, 2000; Strauss & Bacon, 1953; Weschler, Davenport, Dowdall, Moeykens, & Castillo, 1994). Models of environmental (Clapp et al., 2003a; Clapp & Shillington, 2001; Lee, Jones-Webb, Short, & Wagenaar, 1997; Presley, Meilman, & Leichter, 2002) and psychosocial (for a review see Baer, 2002; Griffin, Botvin, Epstein, Doyle, & Diaz, 2000; Windle & Windle, 1996) predictors of alcohol consumption and excessive alcohol use among college students have yielded important findings that have contributed to the design and implementation of campus prevention programs in the U.S. During the past decade, considerable attention has been paid to normative influence on college alcohol consumption (DeJong & Linkenbach, 1999; Keeling, 2000; Perkins, 2002b) and several studies have tested whether altering the perception of norms can result in reductions in drinking behaviors (Borsari & Carey, 2000; Clapp, Lange, Russell, Shillington, & Voas, 2003b; Haines & Spear, 1996; Steffian, 1999; Werch et al., 2000).

SOCIAL NORMS AND ALCOHOL CONSUMPTION

Two types of norms are differentiated in prevention approaches that focus on normative influence: descriptive norms and injunctive norms (Borsari & Carey, 2003; Larimer, Turner, Mallett, & Geisner, 2004). Conceptually, descriptive norms describe the social environment whereby the behavior of others provides a basis of personal behavior through the demonstration of what is socially acceptable (Cialdini & Trost, 1995; Festinger, 1954). Injunctive norms characterize approval or disapproval of a behavior—i.e., your friends' approval of your drinking (Cialdini, Kallgren, & Reno, 1991). Studies examining the misperception of normative behavior consistently find that college students overestimate the quantity and frequency of alcohol consumption (descriptive norms) as well as the approval of drinking (injunctive norms) among their college peers (Baer, Stacy, & Larimer, 1991; for reviews see, Borsari & Carey, 2003; Perkins, 2002b, 2003).

Theoretically, the perception of exaggerated drinking norms may influence drinking behavior among college students as students may feel pressured to conform and drink more than they normally would to gain approval or avoid punishment from their peers (for a review see Perkins, 2002b). The misperception of drinking norms may also influence the maintenance of heavy or excessive drinking if students perceive that most college peers drink considerably more than themselves (Borsari & Carey, 2003). The link between the misperception of college drinking norms and

alcohol consumption has been demonstrated both cross-sectionally (Borsari & Carey, 2003; Larimer et al., 2004; Rimal & Real, 2003, 2005) and prospectively (Larimer et al., 2004; Sher, Bartholow, & Nanda, 2001). In contrast, some studies have shown that attitudes about drinking are better predictors of drinking behavior than drinking-related norms (Trafimow, 1996; Trafimow & Finlay, 1996).

Recently, several studies have attempted to disentangle the independent effects of descriptive and injunctive norms on alcohol consumption with the goal of determining which type of norm is a better predictor of drinking behavior (Larimer, Irvine, Kilmer, & Marlett, 1997; Larimer et al., 2004; Rimal & Real, 2005; Trockel, Williams, & Reis, 2003). For instance, Larimer and colleagues (2004) found evidence for the independent effect of descriptive and injunctive norms on drinking behavior. Using a series of hierarchical multiple regression analyses, the authors found baseline descriptive norm perceptions (i.e., estimates of other's drinking behavior) predicted baseline drinking; however, baseline measures of injunctive norm perceptions (i.e., estimates of other's approval of drinking) were not significantly associated with baseline drinking. In contrast, injunctive norm perceptions at baseline predicted alcohol consumption 1 year later, while perceptions of descriptive norms were not associated with drinking at the 1-year follow-up. The authors suggest the broader and more enduring impact of injunctive norms on drinking behavior may stem from the possibility that the influence of injunctive norms on behavior persists much longer than the influence of descriptive norms (Larimer et al., 2004). Because injunctive norms define what is "socially approved of" by others, the endurance and influence of these norms on drinking behavior may be particularly strong for individuals, like fraternity and sorority members, who identify with the reference group from which the norm is based (Larimer et al., 2004; Terry & Hogg, 1996; Trafimow & Finley, 1996).

EMPIRICAL STUDIES OF NORMS SOCIAL MARKETING INTERVENTIONS

Interest in correcting normative beliefs as a method of reducing heavy alcohol consumption among college students has swelled during the past decade at colleges and universities across the nation because of the low cost, ease of implementation, and intuitive appeal of this approach (Campo et al., 2003; Keeling, 1999; Perkins, 2002b). The basis of the norms social marketing approach is predicated on the notion that exposure to large-scale mass media campaigns designed to correct norm misperceptions about student drinking will cause students who drink heavily to reduce their consumption to actual normative levels.

The results of several uncontrolled campus-wide evaluations of norms social marketing interventions have shown reductions in student alcohol consumption following exposure to normative campaign messages relative to baseline measures of drinking (Glider, Midyett, Mills-Novoa, Johannessen, & Collins, 2001; Gomberg, Schneider, & DeJong, 2001; Haines & Spear, 1996; Mattern & Neighbors, 2004; Perkins & Craig, 2006; cf. Granfield, 2004). However, lacking adequate comparison groups, it is difficult to rule out several threats to the internal validity of these studies.

Using a quasi-experimental, cross-sectional, pre/post design to test the effect of a 6-week norms social marketing campaign in a college residence hall, Clapp and colleagues (2003b) found no difference in drinking behaviors when comparing students' self-reported alcohol consumption in the intervention dormitory to the control dormitory. Wechsler and colleagues (2003) compared several measures of self-reported drinking among college students enrolled at universities employing norms social marketing campaigns to students enrolled at universities without such programs using data obtained from the College Alcohol Survey. Results indicated no significant decrease in alcohol consumption at schools with norms programs even after adjusting for variables such as student's level of exposure to the program and the length of time the program had been in existence at a given university. In contrast, the results of a recent study analyzing data from the National College Assessment survey showed that students at universities with alcohol programs that did not reduce (or in some cases increased) misperceptions of drinking norms consumed more alcohol and experienced more alcohol-related problems relative to students at universities with alcohol programs linked to reduced normative drinking misperceptions (Perkins, Haines, & Rice, 2005).

To date, the most rigorous evaluation of a norm social marketing campaign utilized a multi-site, randomized trial to examine whether self-reported drinking decreased over a 3-year period among college students (DeJong et al., 2006). In this study, 18 universities were randomly assigned to a norms social marketing or control condition and measures of self-reported alcohol consumption were collected from randomly sampled participants at baseline in the year 2000 and again from randomly sampled participants 3 years later. Results of the study indicated no difference in consumption on a composite drinking scale for participants in the intervention condition; however, a significant increase in drinking was observed on this same measure for participants in the control condition. DeJong and colleagues (2006) discuss these results in terms of the norms social marketing campaign having a protective effect on participants at the intervention schools. To bolster their argument the authors provide results from the Core Institute Survey of college student alcohol use, which shows increases in alcohol consumption among a national non-random

sample of college students between 2000 and 2003. However, a similar increase in alcohol consumption was not observed during the same time period in a national random sample of college students obtained from the Monitoring the Future study (Johnston, O'Malley, Bachman, & Schulenberg, 2006). Thus, the results of this study, as well as the results of other norms social marketing intervention studies described earlier are equivocal.

The use of individualized normative feedback, however, has yielded consistently strong results linking changes in normative perceptions to decreases in alcohol consumption (Agostinelli et al., 1995; Cunningham, Wild, Bondy, & Lin, 2001; Lewis & Neighbors, 2004; Neighbors, Larimer, & Lewis, 2004). Because these are individually based normative feedback interventions rather than large-scale norms social marketing campaigns, the ecological validity of comparing the efficacy of these approaches is questionable.

Under circumstances when normative information is focal or salient, the likelihood of using this information increases (Cialdini et al., 1991; Cialdini, Reno & Kallgren, 1990). Thus, if individuals are less aware of the drinking behaviors and attitudes of individuals within a less salient group, it is unlikely normative information will influence behavior (Baer, 1994; Baer et al., 1991; Borsari & Carey, 2003; Carter & Kahnweiler, 2000; Kypri & Langley, 2003; Thombs, Walcott, & Farkash, 1997; Thombs, 2000; Trafimow & Finlay, 1996). Recently, the results of several studies suggest the success of norms social marketing interventions could be improved if the normative information provided to students concerned the drinking behavior of more proximal or personally relevant groups such as friends or best friends as opposed to groups representing the "typical" student (Borsari & Carey, 2003; Campo et al., 2003; Thombs, Ray-Tomasek, Osborn, & Olds, 2005; Yanovitsky, Stewart, & Lederman, 2006).

One assumption of the norms marketing approach is that normative information from disparate sources or reference groups (i.e., undergraduate peers vs groups of friends) is cognitively equivalent. In fact, there is ample evidence suggesting people weight normative information selectively depending on several factors (Brown, Novick, Lord, & Richards, 1992; Cash, Cash, & Butters, 1983). For example, a person will use normative information when the individuals represented by the norm are similar to the self, share a membership category (i.e., race, social group, etc.), and can increase one's feelings of self-worth (Miller & Prentice, 1996). Furthermore, the results of several studies conducted during the past decade indicate an additional factor that may influence the use of normative information: the extent to which an individual identifies with members of a given social category or group (Terry & Hogg, 1996; Terry, Hogg, & White, 1999; Trafimow & Finley, 1996; White, Terry, & Hogg, 1994).

SOCIAL IDENTITY THEORY AND NORMATIVE PERCEPTIONS

The basic tenet of social identity theory posits that one's identity is a cognitive component of the self-concept that is attained through group membership (Terry et al., 1999). The role social identity plays in the use and adoption of normative information has been explored in research examining extensions of the theories of reasoned action and planned behavior (Ajzen, 1985; Fishbein & Ajzen, 1975). In these studies, the perceived norms of a reference group only predicted behavioral intentions for study participants who strongly identified with members of the reference group (Terry & Hogg, 1996; Terry et al., 1999). Thus, if group membership is not salient and one's identification with a reference group is low, normative information will have no effect on behavioral intentions or subsequent behavior (Terry et al., 1999).

To date, there has only been one study examining the effect of social identity on student alcohol consumption. Rimal and Real (2005) tested whether group identity (identification with other university peers) moderates the relationship between descriptive norms and drinking intentions. A significant interaction between social identity and descriptive norms was identified; however, group identity was measured by evaluating participant's perceptions of similarity between themselves and other students at the university and by asking participants the degree to which they looked up to these peers. Arguably, these items tapped dimensions of the social identity construct that may not have fully captured one's identity with university peers. For instance, this operational definition failed to include other dimensions such as the importance of identifying with the group or feelings of a social bond with other group members.

PURPOSE OF THE STUDY

The purpose of this study is to examine whether social identity plays a role in determining the salience of normative information concerning college student drinking behavior. The present research is designed to apply the findings of Terry and colleagues (Terry & Hogg, 1996; Terry et al., 1999) by linking social identity to drinking behaviors and to build on the results obtained by Rimal and Real (2005) by examining three different sources of normative information: friends, college peers at the same university, and members of Greek-letter organizations (fraternity/sorority members). Using an Internet-based questionnaire, we examined the relationship between identifying with these reference groups and the perceived acceptance of heavy drinking (injunctive norm) from members of these respective groups on self-reported alcohol consumption. In general, we predicted that perceptions of heavy drinking acceptance would predict self-reported

drinking only among respondents who reported identifying strongly with the groups that comprised the sources of normative information.

METHOD

Procedure

A random sample ($N=2336$) of undergraduate students attending a large public university in the southwestern United States were invited via e-mail in the fall of 2005 to participate in a web-based questionnaire described as a study concerning college student achievement, lifestyles, alcohol, and other drug behavior. The e-mail invitation included a brief description of the questionnaire as well as a direct link to the survey with instructions on how to participate. A sweepstakes lottery was provided as a respondent incentive to participate, with 20 prizes ranging in value from \$25 to \$250.

Respondents accessed the questionnaire using their student ID number. The use of a student ID for each participant ensured that each respondent could only complete the questionnaire once. Two e-mail reminders were sent to non-responders and to participants who partially completed the questionnaire. The first reminder was sent 4 days after the e-mail invitation while the second was sent 10 days after first reminder. The reminders were similar in content to the initial e-mail invitation. Most of our final sample completed the questionnaire after the initial e-mail or the first reminder. In order to comply with laws and regulations regarding non-solicited e-mail contacts, potential respondents who requested not to be contacted for participation were subsequently removed from all future e-mail contacts. Additionally, a random sample of potential participants ($n=677$) received phone calls reminding them to complete the questionnaire. These calls were made the day before the last e-mail reminder. Messages were left for individuals who did not personally answer the phone. All survey participants completed a consent form, a core set of demographic items, alcohol consumption questions, social identity items, and questions concerning injunctive norms. Because the Internet survey required participants to respond to each question, every item in the questionnaire included a "decline to answer" response option.

Survey measures

Participant demographic and drinking measures. The core demographic items included questions about the respondent's gender, age, and race/ethnicity. For this study the number of drinks per occasion reported by students served as the main dependent variable of interest for our analyses. A drink was defined as 12 ounces of beer (5% alcohol), 12 ounces of wine

cooler (5% alcohol), 5 ounces of wine (12% alcohol), or 1.5 ounces of liquor (80 proof).

We calculated drinks per occasion using a set of items concerning a respondent's alcohol consumption during the past 28 days. Participants were asked to think specifically about drinking during the past 4 weeks (28 days) and to indicate: (1) how many days they consumed at least one drink of beer, wine, or liquor during the past 4 weeks; (2) the number of days (when they did drink) they consumed one or more drinks; (3) the number of days (when they drank more than one drink) they consumed three or more drinks; and (4) the number of days (when they drank more than three drinks) they consumed six or more drinks. A modification of the Consumption Models Analysis Program developed by Gruenewald and Nephew (1993) was used to score the 28-day alcohol consumption items and to calculate drinks per occasion (DPO) for each respondent. The DPO measure was calculated using a mean number of drinks reported for each drinking event. The items used with the calculation do not cover all possible drink quantities, so an interpolation was used assuming a linear distribution of quantities of drinks within each category (i.e., one or more drinks, three or more, etc.) measured.

Social identity measures. The social identity items were based on established scales (Brown, Condor, Mathews, Wade, & Williams, 1986; Terry & Hogg, 1996) and measured a respondent's identity with several groups. All participants were asked the extent to which they identify with their friends, college peers at the same university, and members of Greek-letter organizations. Identification with each reference group was measured with four different social identity items ("How much do you feel you identify with the following groups?", 1=do not identify and 7=strongly identify; "How similar do you feel your attitudes and beliefs are to individuals in the following groups?", 1=very dissimilar and 7=very similar; "To what extent do you feel strong bonds to the following groups?", 1=no strong bond and 7=very strong bond; and "How important are the following groups to your sense of who you are—your self identity?", 1=not very important and 7=very important). These items also included a response option of "does not apply" for each reference group; however, we recoded this response to a value of 1 (indicating weak identification with the group) for each of the identity items. The reliability of the social identity items showed that they had very good internal consistency (Cronbach's alphas): identity with friends $\alpha=0.87$; identity with other university peers $\alpha=0.82$; identity with Fraternity/Sorority members $\alpha=0.80$. Thus, the respondent's scores on the identity items were combined and averaged separately for each reference group.

Injunctive norms measures. The injunctive norms items measured acceptance of heavy drinking and were adapted from Baer (1994). For these items, participants were asked to indicate using a Likert-type scale (1=strong disapproval, 7=strong approval) how their friends, other university peers, and campus Fraternity/Sorority members would respond if they knew the participant: (a) drank alcohol every weekend; (b) drank alcohol daily; (c) drove a car after drinking; and (d) drank enough alcohol to pass out. The reliability (Cronbach's alphas) of the injunctive norms items for each reference group was also good: friends ($\alpha=0.78$), university peers ($\alpha=0.80$), and members of Greek-letter organizations ($\alpha=0.85$). Respondent's scores on the items measuring friends, peers and Greek-letter members' approval of drinking were also combined and averaged separately for each reference group.

Survey participants

A convenience sample of 620 undergraduates completed the *entire* questionnaire (overall response rate=26.5%) and another 80 participants *partially* completed the questionnaire (3.4%). More than two-thirds of the sample was female (68.5%) with a mean age of 20.27 years ($SD=2.16$). The racial/ethnic breakdown of the sample was as follows: white (46.3%), Hispanic/Latino (24.2%), Asian/Pacific Islander (15.6%), African American (3.4%), multi-racial/other (4.2%), and declined/no response (6.3%).

Data analysis

We used hierarchical multiple regression analyses to test the relationship between social identity, injunctive norms, and DPO. Three separate regression models were developed to test this relationship. The first model tested the relationship between respondents' identification with friends, perceptions of their friends' approval of their heavy drinking, and DPO. The second model tested the relationship between respondents' identification with their university peers, perceptions of their university peers approval of their heavy drinking, and DPO. The final model examined the relationship between *non-Greek* members' identification with fraternities or sororities, perceptions of fraternity/sorority members' approval of their heavy drinking, and DPO. We excluded self-identified fraternity/sorority members ($n=56$) from this analysis so that we could examine the relationship between identity and injunctive norms separately for Greek and non-Greek members. Unfortunately, the small sample of self-identified Greek-letter members precluded a meaningful analysis of this sub-sample of respondents. Because perceptions of fraternity/sorority members' acceptability of heavy drinking are likely to have little influence on non-Greek members, being able to show a moderating effect of social identity for these individuals

would provide strong evidence underscoring the importance the role social identity may play in situations of normative influence. The results of the hierarchical regression combining both members and non-members of fraternities/sororities were similar to the results we report for the non-Greek members sub-sample.

Typically, gender, age, and race/ethnicity are correlated with alcohol consumption (Griffin, Scheier, Botvin, & Diaz, 2000; McCabe, 2002; O'Hare, 1990); thus we entered these demographic variables in the first step of each hierarchical model to statistically control for the influence of these variables on our dependent measure. The age variable was not significantly correlated with drinking (see Table 1) and was subsequently dropped from each analysis. It is likely the restricted range for the age variable in this sample resulted in the lack of association between respondent age and alcohol consumption. The social identity and injunctive norms variables were entered in the second step of the models. Two-way interaction terms representing the cross-product of scores on the social identity and injunctive norms indices were entered on the last step of these models.

Because the cross-product of the social identity and injunctive norms values results in multicollinearity between the interaction term and the lower order terms (Aiken & West, 1991), we centered the scores on the social identity and injunctive norms measures and used these centered values to create the interaction terms for the regression models. We also examined the tolerance and variance inflation factor (VIF) values for each model to ensure each model met the statistical assumptions required for regression analyses (Meyers, Gamst, & Guarino, 2006). The model diagnostics results indicated the data used in each respective model met the basic assumptions of the regression methods we employed.

The percentage of participants who declined to answer survey questions varied from less than 1% to 25.8%, with this later percentage pertaining to the injunctive norms items concerning fraternity/sorority members' acceptance of non-Greek members' heavy drinking. It is important to note, however, that the 25.8% of respondents who did not answer these injunctive norms items reported minimal identification ($M=1.1$, $SD=0.29$) with members of fraternities and sororities; thus, the fact that these participants declined to answer these items may reflect their lack of identification with members of these groups. The "decline to answer" responses were coded as missing values for purposes of data analysis. Cases with missing values on the identity and injunctive norms variables as well other variables (gender, race/ethnicity, DPO, etc.) were deleted listwise for each regression model, resulting in different sample sizes for each of the regression models we present in our results.

Although testing a full hierarchical model including gender, race/ethnicity, all three identity terms, all three injunctive norms terms, and

TABLE 1
Correlations between participant demographics, social identity, injunctive norms, and drinks per occasion (DPO)

Variable	1	2	3	4	5	6	7	8	9	10	Mean	SD
1. Gender	1.00	-.109**	.045	-.054	-.073	.031	.225**	.024	.101*	.212**	.	.
2. Race (white/non-white)		1.00	.045	-.063	.007	-.074	-.192**	-.098*	-.105*	-.233**	.	.
3. Age			1.00	-.093*	-.127**	-.138**	-.013	-.068	-.040	-.078	20.28	2.16
4. Identification with friends				1.00	.517**	.135**	.016	-.071	-.056	.219**	5.73	1.26
5. Identification with peers					1.00	.313**	.023	-.251**	-.141**	.181**	4.16	1.34
6. Identification with fraternity/sorority						1.00	.060	-.038	-.105**	.152*	1.40	0.81
7. Injunctive norms: Friends							1.00	.243**	.261**	.455**	2.58	1.05
8. Injunctive Norms: Peers								1.00	.669**	-.010	3.70	1.10
9. Injunctive Norms: Fraternity/sorority									1.00	.070	4.55	1.25
10. Drinks per occasion										1.00	3.12	2.87

* $p < .05$, ** $p < .01$.

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three two-way interactions terms between identity and injunctive norms for each reference group would have afforded us the opportunity to examine the independent contribution of each variable on alcohol consumption, there are several reasons we decided to analyze three separate regression models in lieu of testing the omnibus model. First, the strong correlations between the some of the identity measures (i.e., peers and friends, $r=.517$; peers and Greek-letter members, $r=.313$) would have introduced substantial multicollinearity into the model. Second, the substantial number of missing values associated with the Greek-letter member injunctive norms items would have substantially decreased the sample size for the omnibus model by more than 100 cases; thereby greatly reducing statistical power.

RESULTS

Table 1 presents the correlations between model predictors and drinks per occasion (DPO) for each of the regression models tested in our analyses. As observed in Table 1, both participant gender and race/ethnicity were significantly correlated with DPO. As expected, the significant correlation between drinking and gender and drinking and race/ethnicity indicated more drinking by men and white participants. The association between age and DPO was not significant. The three identification measures were positively correlated with DPO; however, only friend's approval of heavy drinking was significantly associated in a positive direction with drinks per occasion. Identifying with university peers and members of fraternities/sororities was negatively correlated with perceptions of heavy drinking acceptance for university peers and Fraternity/Sorority members, respectively. A similar correlation was not observed between identifying with friends and perceptions of friend's acceptance of heavy drinking.

The results of the hierarchical regression model testing the relationship between respondents' identification with friends, perceptions of their friends' approval of their heavy drinking and alcohol consumption are displayed in Table 2. Results show that both respondents' gender and race/ethnicity were significantly associated with DPO and accounted for almost 9% of the model variance, $F(2, 534)=25.96, p<.001$. As expected, females reported less drinking than males, and whites reported more drinking than non-white respondents. The addition of the identification with friends and friends' injunctive norms terms in the second step of the model resulted in a significant increase in the model R^2 , $F_{\text{change}}(2, 532)=63.58, p<.001$ and accounted for nearly 18% of variance in the model. Both identification with friends and perceptions of friends' acceptability of drinking were significantly related to drinks per occasion. More specifically, stronger identification with friends and greater perceptions of friends' acceptability of heavy drinking were significantly associated with greater self-reported drinking.

TABLE 2

Results of a hierarchical regression analysis predicting drinks per occasion (DPO) as a function of identifying with friends and perceptions of friends' approval of heavy drinking

Step	Variable	B	β	R^2 change	R^2 total
1	Gender [^]	0.696	0.112 **		
	Race/Ethnicity	-0.829	-0.144 ***	0.089 ***	0.089 ***
2	Identity with friends	0.424	0.183 ***		
	Perceptions of friends' approval of heavy drinking	1.069	0.387 ***	0.176 ***	0.265 ***
3	Identity X drinking approval	0.205	0.104 **	0.011 **	0.276 ***

$N=537$. [^]Race/Ethnicity. white=1, non-white=2, [^]gender: female=1 and male=2. * $p<.05$, ** $p<.001$, *** $p<.001$

The addition of the two-way interaction term to the third step of the model significantly increased the model R^2 , $F_{\text{change}}(1, 531)=7.71$, $p<.01$ and accounted for 1.1% of model variance. To explore this interaction further, we calculated simple effects regression lines for three levels of the identity with friends and perceptions of friends' acceptance of heavy drinking variables (low=1 standard deviation below the mean, medium=at the mean, and high=1 standard deviation above the mean). For each level of the identification with friends variable, self-reported drinking significantly increased as a function of perceptions of friends' approval of drinking (low, $\beta=.293$, $p<.001$; medium, $\beta=.387$, $p<.001$; and high, $\beta=.482$, $p<.001$); however, the examination of the standardized coefficients associated with these simple effects regression analyses seems to indicate this effect appears to be stronger as identity with friends increases (Figure 1).

The results of the second hierarchical regression model testing the relationship between respondents' identification with their university peers, perceptions of their university peers approval of their heavy drinking, and DPO are shown in Table 3. Similar to the results summarized Table 2, both gender and race/ethnicity were significantly associated with drinking on the first step of the model and account for 9.5% of the variance, $F(2, 517)=21.15$, $p<.001$ (the difference in R^2 total between the first (Table 1) and second model (Table 2) is a result of sample size changes for each model). The addition of the identity and injunctive norms terms into the model significantly increased the model R^2 from 0.095 to 0.129, an increase of slightly more than 3%, $F_{\text{change}}(2, 515)=9.98$, $p<.001$. Results showed that greater identification with other university peers was associated with more alcohol consumption; however, a similar relationship was not obtained for the effect of perceptions of peer drinking acceptance. The two-way interaction between identifying with peers and perceived peer approval of

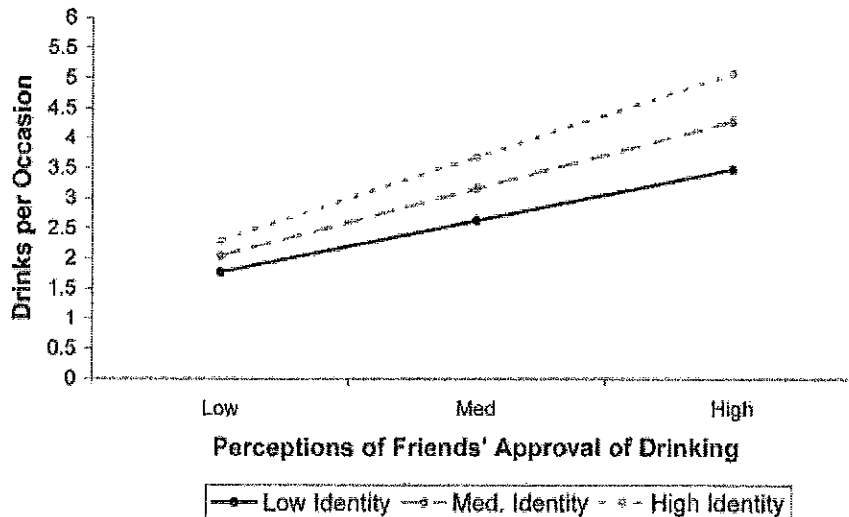


Figure 1. Two-way interaction between identification with friends and perceptions of friends' acceptance of heavy drinking.

drinking was also significant and increased the model R^2 by 1%, $F_{\text{change}}(1, 514)=4.60, p<.05$.

Decomposition of this interaction effect revealed no significant moderating effect of social identity (i.e., non-significant simple slope effects) on the relationship between perceived peer approval of heavy drinking and self-reported alcohol use. However, the significant interaction emerged when examining the relationship between social identity and drinking as a function of perceived peer approval of heavy drinking (Figure 2). Tests of the simple slopes for each level of perceived peer approval indicated that

TABLE 3

Results of a hierarchical regression analysis predicting drinks per occasion (DPO) as a function of identifying with peers and perceptions of peers' approval of heavy drinking

Step	Variable	B	β	R^2 change	R^2 total
1	Gender [^]	1.224	0.200 ***		
	Race/Ethnicity	-1.282	-0.225 ***	0.095 ***	0.095 ***
2	Identity with university peers	0.373	0.177 ***		
	Perceptions of university peers' approval of heavy drinking	0.023	0.009	0.034 ***	0.129 ***
3	Identity X drinking approval	0.157	0.089 *	0.008 *	0.137 ***

$N=520$. [^]Race/Ethnicity. white=1, non-white=2, [^]gender: female=1 and male=2. * $p<.05$, ** $p<.001$, *** $p<.001$

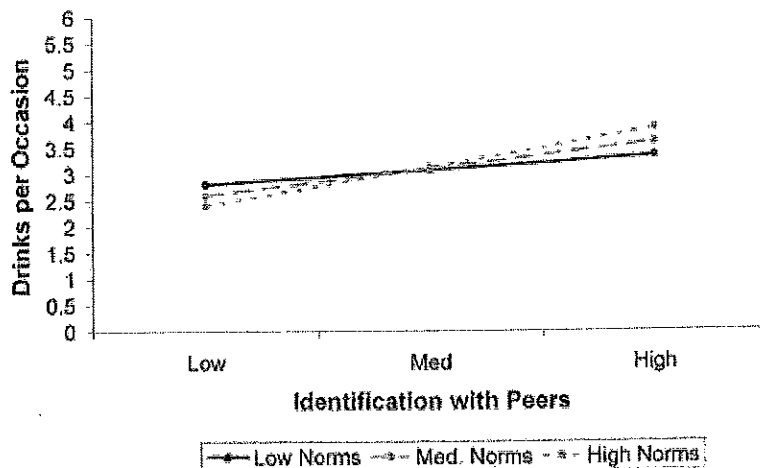


Figure 2. Two-way interaction between identification with peers and perceptions of peers' acceptance of heavy drinking.

self-reported drinking increased significantly for participants with medium and high levels of perceived peer approval as identification with other university peers increased (low, $\beta = .095$, *ns*, medium, $\beta = .175$, $p < .001$; and high, $\beta = .255$, $p < .001$).

Similar to the first two models, the results of the final model—which tested the relationship between *non-Greek* members' identification with members of fraternities or sororities, perceptions of fraternity/sorority members' approval of their heavy drinking, and alcohol consumption—indicated males reported significantly more drinking than females, while non-white respondents reported drinking significantly less than whites (Table 4). The entry of gender and participant race/ethnicity on the first step of the model accounted for 7.5% of model variance, $F(2, 388) = 16.63$, $p < .001$. Again, the difference in R^2 total between the first and third models is a result of changes in the sample size for each model. The entry of the identity with Greek-letter members and perceived approval of heavy drinking terms in the second step of the model significantly increased the model R^2 by 2.3%, $F_{\text{change}}(2, 386) = 4.96$, $p < .01$. Results showed a significant positive association between identifying with Greek-letter members and drinking; however, a similar association was not observed for the effect of perceived approval of heavy drinking by fraternity/sorority members.

The addition of the two-way interaction between identifying with Greek-letter members and perceived approval of heavy drinking also significantly increased the model R^2 by 2.5% (Table 4), $F_{\text{change}}(1, 385) = 11.09$, $p < .01$. As shown in Figure 3, for students who reported low or medium levels of

TABLE 4

Results of a hierarchical regression analysis predicting drinks per occasion (DPO) as a function of identifying with Greek-letter members and perceptions of Greek-letter members' approval of heavy drinking

Step	Variable	B	β	R ² change	R ² total
1	Gender [^]	0.829	0.132 **		
	Race/Ethnicity	-1.113	-0.191 ***	0.075 ***	0.075 ***
2	Identity with Greek-letter members	0.764	0.228 ***		
	Perceptions of Greek-letter members' approval of heavy drinking	0.107	0.046	0.023 ***	0.099 **
3	Identity X drinking approval	0.340	0.178 **	0.025 *	0.124 **

N=391. [†]Race/Ethnicity, white=1, non-white=2, [^]gender: female=1 and male=2. * $p < .05$, ** $p < .001$, *** $p < .001$

identification with Greek members, self-reported drinking did not significantly vary as a function of perceived support for heavy drinking by fraternity/sorority members (low, $\beta = -.082$, *ns*; medium, $\beta = .047$, *ns*). In contrast, respondents with a strong identification with Greek-letter members reported significantly more drinking as a function of the perceived approval of heavy drinking by Greek-letter members increased ($\beta = .172$, $p < .01$).

DISCUSSION

A common finding in the college student drinking literature links perceptions of normative drinking behavior to heavier drinking (Borsari

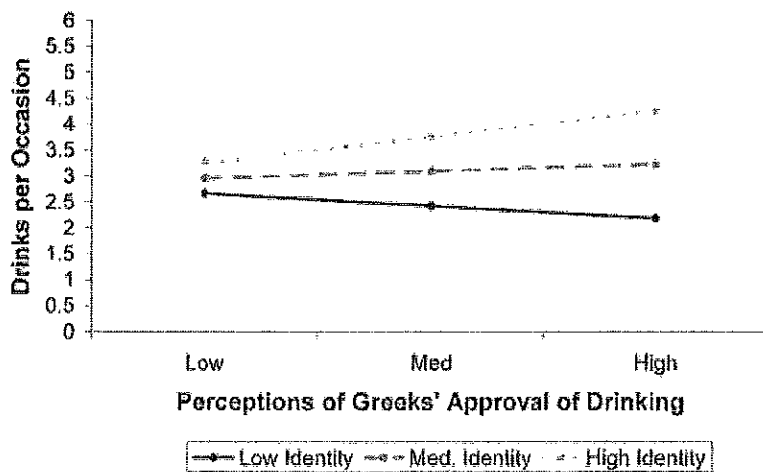


Figure 3. Two-way interaction between identification with Greek-letter members and perceptions of Greek-letter members' acceptance of heavy drinking.

& Carey, 2003; Clapp & McDonnell, 2000; Perkins et al., 2005; Trockel et al., 2003). While this relationship is robust, it does not provide an explanation as to why normative information would be positively associated with alcohol consumption. Although some authors have elucidated possible explanations for why normative information may influence the consumption of alcohol (Borsari & Carey, 2001; Perkins, 2002b), a clear mechanism by which this association operates has not been identified in the literature. Overall, the results of this study suggest the potential moderating influence of social identity on the relationship between normative perceptions and self-reported alcohol consumption at least for reference groups such as friends, peers, and Greek-letter members. More specifically, the extent to which normative information predicts alcohol consumption may depend on the strength in which an individual identifies with the reference group on which the norm is based.

The significant two-way interaction observed between respondents' identification with their friends and perceptions of heavy drinking acceptance suggests that even among groups of people with defined friendships, normative information regarding alcohol consumption may only affect one's own drinking under circumstances where group membership is important. The strongest relationship observed between perceptions of normative information and self-reported drinks per occasion was found for respondents who identified the strongest with their friends; however, a significant relationship between perceptions of friends' acceptability of heavy drinking and alcohol consumption was also observed at low and medium levels of the social identity variable for these respondents. It is important to note, however, most respondents identified very strongly with their friends ($M=5.73$, $SD=1.26$), and even those who reported relatively low identification with friends (scores falling 1 standard deviation below the mean) had a mean identification score near the mid-point of the identification scale ($M=3.10$, $SD=1.07$).

The pattern of results of the two-way interaction obtained for the Greek-letter member referent group regression model (Figure 3) corresponds more closely to the hypothesized moderating effect we expected to find in this study. Specifically, perceptions of heavy drinking acceptance were only associated with heavier self-reported drinking among non-Greek members when these individuals identified strongly with members of campus Greek organizations. For respondents who did not identify with Greek-letter members, perceptions of normative information regarding the acceptance of drinking had no effect on self-reported alcohol consumption. The fact this was observed in a sample of non-Greek members underscores the potential importance the role social identity plays in the perception of normative information because these participants were not members of this social group. Alternatively, it is also possible the respondents who identified the

strongest with Greek-letter members also had social networks comprised of friends and acquaintances who are members of these organizations.

Many norms social marketing campaigns use "typical university peers" as referent groups in the messages used to market the true campus drinking norm (Clapp et al., 2003b; Steffian, 1999), but the results obtained from the regression model examining the peer referent group (Table 3) suggest normative information concerning peers' acceptance of heavy drinking may only exert an influence on drinking behavior under conditions where an individual identifies strongly with his or her campus peers. Specifically, the significant interaction between peer identification and peer norms indicated that alcohol consumption increased significantly as identification with peers increased but only for those participants who perceived greater acceptance of heavy drinking among their university peers. Additionally, for this model (as well the Greek-letter members model), we did not find a significant association between perceptions of heavy drinking acceptability among university peers and drinks per occasion, replicating the results of other studies that have examined the relationship between injunctive or subjective norms on current drinking behavior (Larimer et al., 2004; Perkins & Berkowitz, 1986; Trockel et al., 2003; cf. Rimal & Real, 2005).

The implications of these findings as they relate to norms social marketing campaigns on college campuses are important and are consistent with the results of recent studies that suggest the use of more proximal or personally relevant groups in norms social marketing campaigns (Borsari & Carey, 2003; Thombs et al., 2005; Yanovitzsky et al., 2006). Specifically, on campuses where students do not identify strongly with their university peers as a whole, the use of normative information about the drinking behavior of "the typical college peer" may not be relevant to many students who regard this reference group as unimportant. It is important to note, however, that most norms social marketing campaigns utilize descriptive normative information as opposed to injunctive norms, and as such, it may be premature to extend our results to interventions utilizing descriptive norms campaigns. Furthermore, generalizing our results to other universities with different student populations may be difficult given the possibility that participants in this study may identify less with their peers simply because they attend a large university (>25,000 undergraduate student enrollment) with a relatively small residential population.

The strength of identification with a reference group is an important factor moderating the relationship between subjective (injunctive) norms and behavioral intentions or actual behavior. The results of several studies indicate normative information from a reference group will have no effect on intentions or subsequent behavior of an individual if he or she does not strongly identify with the reference group in question (Terry & Hogg, 1996; Terry et al., 1999). Thus, the salience of normative information to an

individual is an important factor in whether this information will subsequently influence behavior (Cialdini et al., 1990, 1991). To date, most studies in this area of research have examined health-related behaviors such as engaging in regular exercise or protecting oneself from the sun (Terry & Hogg, 1996; Terry et al., 1999), and there has only been one investigation of the moderating influence of social identity on the relationship between injunctive norms and alcohol consumption (Rimal & Real, 2005). However, unlike the present study, strong evidence for a moderating effect of social identity was not obtained (i.e., the significant interaction contributed less than 1% to the variance of the regression model) and the measure of social identity used in their investigation tapped different aspects of group identification (i.e., aspiring to be in referent group and perceived similarity to other group members) than other measures that have been used in the past (see Brown et al., 1986; Terry & Hogg, 1996). Additionally, Rimal and Real (2005) only examined one possible referent group (i.e., campus peers) while the present investigation included three different social groups.

Thus, applying social identity theory (e.g., Terry & Hogg, 1996; Terry et al., 1999) to our results, the content of one's social identity includes membership in social groups, which in turn comprises normative information about the group. The normative information is personally relevant because it describes not only one's beliefs about the expectations of others, but also one's expectations for oneself. For groups in which one does not identify, normative information is essentially irrelevant to one's behavior (except perhaps in cases of coercion).

The significant interactions we found between social identity and injunctive norms provide additional evidence for the idea that people may selectively weigh normative information (Brown et al., 1992; Cash et al., 1983, Miller & Prentice, 1996) and that individuals may not cognitively consider all normative information about peers or other reference groups equivalently. The results of this study support the notion that normative information may be weighted more heavily if it refers to members of important reference groups an individual shares a sense of identity with and not simply groups that have similar attributes to an individual (Miller & Prentice, 1996). The implications of these findings emphasize the importance of considering the audience of norms social marketing campaigns as well as the source of the normative information to ensure the relevancy of this information (Thombs et al., 2005).

Limitations of the study

Although we were able to demonstrate a potential moderating effect of social identity on the relationship between injunctive norms and drinks per

occasion, the causal direction of these relationships remains unclear and the potential for alternative explanations of our results exists. In this study we hypothesized that the strength of one's identity with a group is a factor influencing the weight and use of normative information. While the findings we report support this hypothesis, it remains equally plausible that a different relationship could account for these results. For instance, the motivation to drink, coupled with the injunctive norms of a reference group may affect how strongly an individual identifies with the group. Thus, an individual who is intent on drinking heavily may seek out and join a social group that is tolerant of such behavior. Another plausible explanation for the results observed in this study is a reverse causation model based on the false consensus effect (Ross, Greene, & House, 1977). For example, it may be that the heavy-drinking participants in our sample also believe that other people with whom they strongly identify drink heavily as well.

A second limitation concerns the fact we only examined the effect of social identity on the relationship between *injunctive* norms and alcohol consumption; thus, we should not necessarily assume social identity would have the same moderating effect on the relationship between *descriptive* norms and drinking behavior. Although there is some evidence showing that injunctive and descriptive norms are conceptually different constructs with independent effects on drinking behavior (Larimer et al., 2004; Trockel et al., 2003), gambling behavior (Larimer & Neighbors, 2003), and recycling behavior (Cialdini, 2003) future research will be necessary to test whether the extent to which an individual identifies with a group affects the interpretation and use of descriptive normative information concerning social groups.

As observed in Table 1, participants' identification with their peers and Greek-letter members was negatively correlated with perceptions of peers and Greek-letter members' acceptance of heavy drinking, respectively. Thus, it is possible multicollinearity may have been a problem on the second step (i.e., entry of the main effects of social identity and injunctive norms) of the regression models presented in Tables 3 and 4. Multicollinearity between these variables could explain the non-significant main effects we obtained for the injunctive norm terms in these models if the social identity terms for both models accounted for most of the variance in the second step of these analyses. This is not likely, given the tolerance and VIF values for these terms in both models were close to 1 (i.e., tolerance values were slightly less than 1 and the VIF values were slightly greater than 1) and within the acceptable range required to meet the statistical assumptions of multiple regression analysis. Typically, multicollinearity exists when tolerance values near 0 and VIF values become large (Meyers et al., 2006). We also ran additional hierarchical regression models and entered the subjective norms

and social identity terms for the peer and Greek-letter membership referent group models on separate steps and obtained the same results; namely, significant main effects for the social identity terms but not the injunctive norms terms.

Because most participants likely completed the alcohol consumption and injunctive norms items during the same Internet session, it is possible that recalling past drinking behaviors may have influenced participants' responses to the injunctive norms items; and thus may reflect attitudes towards drinking and not perceptions of how others view heavy drinking. However, because only the measure of friends' acceptance of heavy drinking was significantly correlated with drinks per occasion, it is unlikely participants' general attitudes concerning drinking entirely influenced their responses to the injunctive norms items.

Lastly, our low response rate must also be considered as another potential limitation of this study. Although a response rate of 26.5% has dubious external validity when estimating population parameters, the primary intent of this study was to test the conceptual relationship between social identity, normative information, and drinking behavior. It is possible that responders differed from non-responders on variables measuring social identity, peer and friends' influence, and alcohol consumption; however, our significant interaction findings between social identity and injunctive norms suggests that such a bias may not have occurred. Future studies, both conceptual and with the goal of estimating population parameters, are needed to validate our findings.

CONCLUSIONS

Through the inclusion of social identity measures, the relationship between normative information and drinking behavior is better understood. While previous studies have demonstrated that measuring perceived norms for students within referent groups provides better norm/behavior correspondence, within the college-drinking literature, group membership has always been a proxy measure of identity. This study demonstrates that with a relatively few, highly reliable items, a measure of identity can be employed yielding both main-effect and potentially moderating relationships with alcohol consumption. The results of this study also suggest mass-marketing approaches to norms social marketing may provide irrelevant information for students who identify little with the marketed referent group. For example, students may identify minimally with other peers at their university, and thus norms marketing campaigns using peers as a reference group may fail simply because the target audience does not identify with this group. Future research should examine whether tailoring norms social marketing messages to specific social groups such as fraternities or sororities

improves the effectiveness of campus-level norms interventions as well as individually based normative feedback interventions.

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