



Digital Commons@

Loyola Marymount University
LMU Loyola Law School

Heads UP

Psychology

4-2010

Whose Opinion Matters? The Relationship Between Injunctive Norms and Alcohol Consequences in College Students

Joseph W. LaBrie

Loyola Marymount University, jlabrie@lmu.edu

Justin F. Hummer

Loyola Marymount University, jhummer@usc.edu

Clayton Neighbors

University of Washington

Mary E. Larimer

University of Washington

Follow this and additional works at: <https://digitalcommons.lmu.edu/headsup>



Part of the [Psychology Commons](#)

Recommended Citation

LaBrie, J. W., Hummer, J. F., Neighbors, C., & Larimer, M. E. (2010). Whose Opinion Matters? The Relationship Between Injunctive Norms and Alcohol Consequences in College Students. *Addictive Behaviors*, 35(4), 343–349. <http://doi.org/10.1016/j.addbeh.2009.12.003>

This Article - pre-print is brought to you for free and open access by the Psychology at Digital Commons @ Loyola Marymount University and Loyola Law School. It has been accepted for inclusion in Heads UP by an authorized administrator of Digital Commons@Loyola Marymount University and Loyola Law School. For more information, please contact digitalcommons@lmu.edu.



Published in final edited form as:

Addict Behav. 2010 April ; 35(4): 343–349. doi:10.1016/j.addbeh.2009.12.003.

Whose Opinion Matters? The Relationship Between Injunctive Norms and Alcohol Consequences in College Students

Joseph W. LaBrie¹, Justin F. Hummer¹, Clayton Neighbors², and Mary E. Larimer²

¹Department of Psychology, Loyola Marymount University, 1 LMU Drive, Suite 4700, Los Angeles, CA 90045

²Department of Psychiatry and Behavioral Sciences, 1100 NE 45th St, Suite 300, Seattle, WA, 98105-4944

Abstract

Harm reduction approaches may benefit from research extending the exploration of predictors of alcohol use per se to those components most directly related to alcohol-related harm. This investigation evaluated the relationship between perceived injunctive norms of alcohol use (level of approval of drinking behaviors in specific situations) and the experience of alcohol-related consequences as a function of typical student reference groups at increasing levels of similarity to the respondent: based on race, gender, Greek status, and combinations of these dimensions, as well as parents, close friends, and the students' own attitudes. Participants were 3753 students (61% female) from two campuses who completed an online survey. Preliminary analyses determined that there were no differences in the relationship between perceived injunctive norms and consequences across the eight student groups of varying specificity, thus all eight levels were combined into one variable of perceived student injunctive norms. However, the relationship between this variable and consequences was weaker than the perceived attitudes of more proximal referents (parents, close friends, as well as their own personal attitudes). Subsequent analyses predicting consequences while controlling for demographic variables and drinking level, revealed that perceived injunctive norms for students, parents, and close friends as well as personal attitudes each significantly predicted consequences. Results suggest an important role for perceived injunctive norms in the experiencing of consequences over and above the amount of consumption and point to types of injunctive norms feedback that might form effective interventions (i.e., incorporating close friend and parent feedback as well as general student feedback).

1. Introduction

An increasing amount of research is being generated on alcohol use among adolescents and college students. A primary reason for the influx of resources aimed at understanding this dynamic is the alcohol-related negative consequences that are experienced by drinkers and non-drinkers alike. In 2001, an estimated 500,000+ unintentional injuries and more than 1,700 U.S. college student deaths were alcohol-related, an increase of nearly 6% from 1998 (Hingson, Heeren, Winter, & Wechsler, 2005). The proportion of college students who reported driving while under the influence of alcohol also increased from 26.5% to 31.4% during the same three

Please direct all correspondence regarding this manuscript to Joseph LaBrie, Department of Psychology, Loyola Marymount University, 1 LMU Drive, Los Angeles, CA 90045. Phone: (310) 338-5238, Fax (310) 338-2776, jlabrie@lmu.edu.

Publisher's Disclaimer: This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

years. Excessive drinking, in particular, increases the risks of fatal and non-fatal injuries, academic failure, violence and other crime and unsafe sexual behavior (Goldman, 2002; Presley, Meilman, & Cashin, 1997; Wechsler, Lee, Kuo, & Lee, 2000; Wechsler, Lee, Nelson, & Lee, 2001; White & Jackson, 2004-2005) and is associated with long term repercussions (White & Jackson, 2004-2005). Finally, acute alcohol intoxication is associated with increased accidental and self-inflicted injuries (Rehm et al., 2003). While these statistics are cause for concern, the effects of alcohol use among college students extend farther than the drinking individual. Second-hand consequences are experienced by other students, as well as neighbors in the surrounding communities of college campuses (e.g. physical, verbal and sexual assaults, vandalism, aggressive confrontation, sleep disturbances, etc.) (Wechsler et al., 2002). For example, an estimated 600,000+ students are hit/assaulted by another drinking student each year (Hingson et al., 2005). The negative impact that can result from alcohol use and misuse among college students warrants research that can be incorporated into the formation of prevention and intervention programs.

Most current alcohol treatment programs for college students include moderate drinking and harm reduction as their primary goals (Barnett et al., 2004). Harm reduction approaches have nearly replaced abstinence only approaches and are designed to “meet people where they're at” in an effort to reduce identifiable harms associated with alcohol use (Marlatt et al., 1998). The sought after reduction in harm however, is nearly always viewed as a function of reductions in alcohol use as the primary outcome variable. As a result, a large body of research and application has been devoted to identifying significant predictors of alcohol use that can be targeted to achieve reductions in drinking and thus, decrease harm associated with use. However, as of 2002 and despite the massive proliferation of college prevention programs, there has not been an overall reduction in problems related to alcohol use among college students (Wechsler et al., 2002).

More recently, White (2006) conducted a rigorous review of the promising technique known as personalized feedback interventions (PFIs) for reducing the harms associated with alcohol use. PFIs provide students with feedback about their own drinking patterns relative to college norms, as well as information about other aspects of their drinking behaviors, related problems and/or perceived risks. White concluded that students receiving PFIs reduced drinking and related problems more than those not receiving a PFI, thus supporting the efficacy of this method. Due to the inefficiencies associated with general prevention programs to reduce problems associated with use and the apparent potential for the PFI technique, the harm reduction approach may further benefit from research extending the exploration of predictors of alcohol use per se to those components most directly related to alcohol-related harm. Moreover, research has found the correlation between drinking quantity and frequency and alcohol-related negative consequences in this population to rarely exceed the moderate range of .6 (Larimer et al., 2001; Turner, Larimer, & Sarason, 2000). This suggests that substantial variance in the experience of alcohol problems on college campuses cannot be explained by drinking behavior alone. The current study sought to investigate this theoretical extension by elucidating direct pathways to alcohol-related negative consequences via an established construct associated with alcohol use; social norms. By identifying the association between perceived norms and alcohol problems, prevention science can be more fully tailored to meet the goal of reduced alcohol-related risk among college students.

Social norms theory posits that perceptions of what constitutes typical actions or beliefs of one's peer group, also known as perceived norms, influence behavior (Berkowitz, 2004). In the context of collegiate alcohol use, perceived norms are typically categorized into two types: *Descriptive norms* refer to the perception of others' quantity and frequency of drinking (Borsari & Carey, 2001; 2003), whereas *injunctive norms* relate to the perceived level of approval of specific alcohol-related behaviors in specific situations (Cialdini, Reno, & Kallgren, 1990).

Research indicates that these perceived norms are among the strongest predictors of alcohol use for this population (for review see Borsari & Carey, 2003; Neighbors, Lee, Lewis, Fossos, & Larimer, 2007; Perkins, 2002). Of particular interest in this relationship however, is that to date, more than 25 studies have revealed misperceptions in peer drinking norms, with students consistently overestimating both descriptive and injunctive norms (Berkowitz, 2004; Perkins, 2002). For example, a nationwide study of college students found that 71% overestimate the amount of alcohol used by peers (Perkins, Haines, & Rice, 2005), and a meta-analysis of 23 college drinking studies revealed misperceptions in 91% of the measures investigated (Borsari & Carey, 2003). Moreover, these overestimations of descriptive norms have consistently been associated with heavy drinking (e.g. Borsari & Carey, 2001; Borsari & Carey, 2003; Lewis & Neighbors, 2004; Neighbors et al., 2007) and in a similar manner, overestimations of injunctive norms have been found to be correlated with personal drinking quantity, frequency, heavy drinking, and drinking to intoxication (Nagoshi, 1999; Perkins & Wechsler, 1996; Wood, Nagoshi, & Dennis, 1992). A more recent study by Reed and colleagues (2007) found that injunctive norms were indeed predictive of alcohol consumption, yet this was found to be the case primarily when an individual strongly identified with the reference group. While extant research has identified several moderators of the norms-behavior link, the underlying mechanism by which normative influence is understood to function is via indirect peer influence in which the individual acts in a manner that's characteristic of the perceived group norm rather than their personal view or attitude (Berkowitz, 2004; Borsari & Carey, 2001).

Because of the consistency and magnitude with which perceived norms are overestimated, these constructs are frequently manipulated in PFIs. Typically such techniques seek to amend inaccurate normative misperceptions by exposing and augmenting existing healthy norms among one's referent group that individuals have falsely believed to be atypical (Berkowitz, 2004; Lewis & Neighbors, 2006). By revealing the actual, more modest norm, it is thought that students will then act or adjust one's beliefs to be more in line with the new, accurate, normative perception. Correcting overestimations mediates reductions in drinking.

While much research has been conducted with descriptive norms, decidedly less is known about how injunctive norms function in the college student drinking sphere. Given the similarities in the scope and functionality of descriptive and injunctive norms, the relative lack of research with injunctive norms, and the potential for its use in harm-reducing interventions, the current study focuses on the direct relationship between perceived injunctive norms and alcohol problems. More specifically, this research seeks to evaluate how perceptions regarding others' attitudes towards risky drinking behaviors are directly related to the amount of negative alcohol-related consequences an individual experiences, over and above what is accounted for by alcohol use.

To date, very few studies have examined how injunctive norms and alcohol problems are related or explored the potential utility of such a relationship. Early research evaluating the direct effect of an injunctive norm on alcohol problems found no independent influence on problems, but did find that it was predictive of alcohol use (Wood et al., 1992). Wood and colleagues (2001) found that injunctive norms were related to alcohol problems however the injunctive norms measure was technically a social modeling construct that also incorporated a descriptive norms item (friend's alcohol use). This makes it difficult to be certain about the observed result. A more recent study attempted to disentangle the independent effects of group-specific descriptive and injunctive norms on drinking behavior and consequences among Fraternity and Sorority students (Larimer, Turner, Mallett, & Geisner, 2004). The authors found that participants' baseline perceptions of injunctive norms of other group members significantly predicted concurrent drinking and alcohol-related consequences as well as drinking and consequences assessed at one-year follow up. In contrast, baseline perceived descriptive norms did not exhibit a relationship with consequences at either time point or with

drinking at the follow up. Note, in this study injunctive norms were defined for a more proximal reference group (members of one's own fraternity/sorority) than were descriptive norms (members of one's pledge class which could include pledges from other fraternities/sororities). However, it is possible that the influence of injunctive norms on behavior and subsequent consequences persists longer than the influence of descriptive norms. Thus, the current study builds on findings with promising avenues as noted in Wood et al. (2001) and Larimer et al. (2004), by evaluating the direct effect of injunctive norms on alcohol-related consequences among a large representative sample of college students.

Because injunctive norms define the social approval by important others, the endurance and influence of these norms on drinking behavior and the ability to reduce negative consequences may rely on the individual's level of similarity to the reference group on which the norm is based (Larimer et al., 2004; Terry & Hogg, 1996; Trafimow & Finlay, 1996). In general, level of similarity appears to operate as a function of proximity. Recent work has revealed the critical importance of considering the specificity of the reference group in the relationship between injunctive norms and drinking (Neighbors et al., 2008). The authors found that the relationship varies considerably by the proximity of the reference group, and studies that have assessed injunctive norms more generally (Alva, 1998; Armitage & Conner, 2001; Larimer et al., 2004; Sheppard, Hartwick, & Warsaw, 1988) may be masking the impact of specific reference groups. However, to date no research has evaluated this issue with respect to alcohol-related problems. It is important to understand the direct link between perceived injunctive norms for various reference groups and alcohol-related consequences in order to determine what types of normative education may be appropriate and effective (Mattern & Neighbors, 2004).

The relatively small amount of research looking at the relationship between injunctive norms and alcohol-related problems, in contrast to a host of research in the last decade using alcohol use as the dependent variable in examining the effects of perceived norms, is surprising given the large role that norms play in the design of current preventative programs at colleges. The present research evaluates the influence of varying levels of specificity of the reference group on the relationship between injunctive norms and alcohol-related problems, while controlling for overall alcohol use, within a large representative sample from two campuses. This research extends prior work in this area by broadening the focus beyond Greek-affiliated students and incorporating specificity of reference group via several combinations of student-affiliated referents, parents, and close friends, to help identify what types of future normative interventions may be most effective at reducing alcohol problems. We expected stronger positive associations between perceived injunctive norms and alcohol-related negative consequences as a function of level of specificity of reference group such that more proximal rather than more distal groups would exhibit stronger associations between perceived approval of drinking and consequences.

2. Method

2.1 Participants

Participants were 3753 students who completed an online survey during fall 2007. The sample was recruited from two west-coast campuses, one a large public university and the other a private mid-sized university. Recruitment rates by school were nearly even at 52% and 55%. The two campuses were selected due to the potential increase in generalizability resulting from the combined diversity of the demographic characteristics within the schools. Participants were primarily female (61%) and had a mean age of 19.88 years ($SD = 1.36$). The distribution by class year status was approximately even, with 18.9% first-year, 24.5% sophomore, 27.4% junior, and 29.2% senior. Over half (57.4%) of participants identified themselves as Caucasian, 18.7% Asian, 10.7% Multiracial, 7.8% "Other", 3.2% African American, 1.7% Hawaiian/Pacific Islander, and 0.5% American Indian/Alaskan. Further, 12.7% of the sample reported

Hispanic/Latino ethnicity. These ratios of ethnic identification are representative of the institutions where the research was conducted, with the exceptions being a slight under-sampling of African American students and a slight over-sampling of Asian students. Among all participants, there was a mean was 6.04 ($SD = 8.58$) drinks over 1.59 ($SD = 1.53$) drinking days per week. A substantial minority (32.5%) described themselves as non-drinkers. Those identifying as drinkers (67.5%) reported an average of 8.94 ($SD = 9.11$) drinks over 2.36 ($SD = 1.30$) drinking days per week. All participants were included in analyses.

2.2 Design and Procedure

During the first two weeks of the fall semester, 7000 students (random samples of 3500 from each campus' registrar list) received letters containing a unique personal identification number (PIN) and informing them of an opportunity to participate in a study about alcohol use and perceptions of drinking in college. Following the letters, students received an email with a link to the online survey. Although the majority of students completed the survey following this initial email, attempts were made to continuously recruit non-responders via up to 4 email reminders throughout a two week period. Upon clicking on the link and entering their PIN, they were routed to an IRB-approved informed consent form with additional information about confidentiality, voluntary participation, and human subjects protections. Students were only transferred to the online survey if they electronically gave consent. Participants were compensated \$20 for completing the 20-minute survey.

2.3 Measures

The survey included a variety of measures. Constructs relevant to the current study include demographics, alcohol-related negative consequences, and measures of drinking norms.

2.3.1 Injunctive norms and reference groups—The Injunctive Norms Questionnaire (Baer, 1994) was used to assess attitudes toward drinking behaviors. Four injunctive norms items were asked for each of 10 reference groups and for personal attitudes. Participants reported the extent to which they believed each reference group approved of “drinking alcohol every weekend”; “drinking alcohol daily”; “driving a car after drinking”; and “drinking enough to pass out.” Response options ranged from 1 (*strongly disapprove*) to 7 (*strongly approve*). The 10 reference groups, most distal to most proximal were as follows: 1) typical student on campus ($\alpha = .68$); 2) typical same sex student on campus ($\alpha = .68$); 3) typical same race student on campus ($\alpha = .66$); 4) typical same Greek status student on campus ($\alpha = .65$); 5) typical same sex and same race student on campus ($\alpha = .66$); 6) typical same sex and same Greek status student on campus ($\alpha = .68$); 7) typical same race and same Greek status student on campus ($\alpha = .69$); 8) typical same sex, same race, and same Greek status student on campus ($\alpha = .70$); 9) parents ($\alpha = .58$); 10) close friends ($\alpha = .73$); and finally, personal attitudes of self ($\alpha = .66$). The reference group ‘parents’ did not specify between mothers or fathers but was left to the respondent to operationalize. An injunctive norm composite variable was calculated as the mean of the four items for each reference group, reflecting the overall injunctive norm for that level of specificity, as seen in Table 2. Note given the high intercorrelations among the eight norms variables referring to typical students at varying levels of specificity ($\alpha = .97$) we also created a composite variable, henceforth referred to as typical student composite.

2.3.2 Alcohol consequences were assessed using the Rutgers Alcohol Problem Index (RAPI; White & Labouvie, 1989)—The RAPI assessed the occurrence of 25 negative consequences resulting from one's drinking over the three months (i.e. “Not able to do your homework or study for a test” and “Had withdrawal symptoms, that is, felt sick because you stopped or cut down on drinking”). Two items assessing driving after 2 or more and 4 or more drinks were added to the standard 23-item measure. Each item is rated on a scale from 1-4 with 1 indicating “never” and 4 indicating “more than 10 times”. Inter-item reliability was

very good for the RAPI ($\alpha = .92$). A summed composite variable of the RAPI was calculated for use in all analyses.

2.3.3 Alcohol use behavior—Alcohol use was assessed using the Daily Drinking Questionnaire (DDQ; Collins, Parks, & Marlatt, 1985; Dimeff, Baer, Kivlahan, & Marlatt, 1999). Instructions asked participants to consider a typical week in the past month. Then, successive questions asked “How many drinks did you typically consume on a Monday? Tuesday? Etc.” Students' responses were summed to form a ‘total drinks per week’ variable that was used in the analyses.

3. Results

First, zero-order correlations assessed associations between alcohol-related problems, alcohol use, and each of the injunctive norms constructs, as presented in Table 1. Inter-correlations between the study's main variables were all significant ($p < .001$), with the exception of the correlation between injunctive norm for typical student and alcohol use ($p > .05$).

Means and standard deviations for injunctive norms variables and alcohol problems as well as zero-order correlations between injunctive norms and alcohol problems are presented in Table 2. The pattern of correlations appeared consistent with the central hypothesis that the association between injunctive norms and problems would increase as a function of level of specificity of the reference group. To evaluate this more formally we conducted tests of differences between overlapping dependent correlations using the procedure described by Meng, Rosenthal, & Rubin (1992). The results of these tests are represented by subscripts in Table 2, where correlations that do not share subscripts are significantly different from each other. Despite the apparent pattern, with respect to differences among perceived norms for students at varying levels of specificity, none of the correlations among them were significantly different from each other. In contrast the association between perceived norms for parents and alcohol-related problems was significantly stronger than the relationship between alcohol-related problems and perceived norms for typical students; students of same race; and students of same sex but not students of same Greek status or any of the combined student reference groups or the typical student composite. The association between perceived norms for close friends and alcohol-related problems was significantly stronger than the association between alcohol-related problems and any of the perceived norms variables for students. It was not significantly stronger than the association between perceived norms for parents and alcohol-related problems. Similarly, the association between perceived norms for self, which is functionally the same construct as attitude toward drinking, and alcohol-related problems was significantly stronger than the association between alcohol-related problems and all other perceived norms variables with the exception of close friends. Moreover, while the pattern of correlations was in the direction of hypotheses, significant distinctions among them were limited to difference between student reference groups and more proximal references (i.e., parents, friends, and self).

We continued to test the hypothesis by using hierarchical multiple regression with alcohol-related problems specified as the criterion. Order of entry was based on proximity. Demographic variables (campus, sex, and race) were included as covariates at step 1. Sex was dummy coded (men = 1). Race was specified as two dummy coded variables: Asian = 1 and other non-white races = 1. Thus, coefficients for the two race variables represent effects relative to white students. Typical number of drinks consumed per week was entered as a covariate at step two. At step three, the student composite variable was entered. Note we used this variable rather than the eight separate variables because the tests of differences among correlations with problems and their high intercorrelations indicated that they were not significantly different from each other. Moreover, initial analyses including all eight variables in the regression

analyses resulted in considerable variance inflation (several variance inflation factor scores > 10). Cohen, Cohen, West, and Aiken (2003) suggest that VIF scores above 10 provide evidence of serious problems with multicollinearity and that 10 is a relatively liberal cutoff. At step four, injunctive norm for parents and close friends were entered. Finally, at step five the individual's personal attitude (i.e., level of approval for one's own behavior) was entered.

Collinearity diagnostics revealed that all VIF scores were below 2 with the exception of step five where the VIF score for friends and self were 2.72 and 3.16, respectively.

Regression results are presented in Table 3. Results for demographic covariates at step 1 revealed that students on one campus reported significantly more alcohol-related problems than students on the other campus. Men reported more alcohol-related problems than women. In addition, non-Asian non-white students reported significantly fewer problems relative to white students. Results at step two revealed, not surprisingly that alcohol consumption was positively associated with number of alcohol related problems. Results at step three indicated that perceptions of other students approval, as operationalized by the typical student composite, accounted for unique variance in alcohol-related problems over and above demographic variables and alcohol consumption. Results at step four revealed that that perceptions of approval of drinking by parents and close friends each accounted for unique variance over and above demographics, drinking, and perception of approval of other students. Finally, results at step six revealed that one's own approval of risky drinking behaviors accounted for unique variance over and above perceptions of demographics, drinking, and others' approval (students, parents, or friends).

4. Discussion

The negative effects of alcohol use on college students constitute a major area of inquiry with a large amount of resources devoted to ameliorating these consequences. The harm reduction approach relies heavily on the ability to reduce consequences both for the individual drinker and for society (including risks to others posed by the individual drinker's behavior). The present investigation builds on prior research (Larimer et al., 2004) to evaluate the relationship between perceived injunctive norms (approval of alcohol use) and the experience of alcohol-related consequences while controlling for drinking and examining injunctive norms at increasing levels of proximity to the participant. Norms assessed include norms for typical students at increasing levels of similarity to the respondent (based on race, gender, Greek status, and combinations of these dimensions) as well as more proximal reference groups including parents, close friends, and the students' own attitudes about appropriate behavior.

Tests of differences between overlapping correlations provided the first examination of how differing levels of specificity in the norms constructs were related to alcohol problems. Of interest here is that the distinctions in the associations between the 10 specificity levels and problems could also be minimized into three categories: a student reference group composite based on varying characteristics (i.e. race, sex, Greek status), more proximal referents (parents and close friends), and one's own attitudes. Particularly stronger than others, was the magnitude of the association between injunctive norms for close friends or self, and alcohol-related problems. Thus, these initial tests provided general support for the hypothesis, yet also provided important information towards revised conclusions. Specificity does indeed matter, however, variations of injunctive norms for the more abstract combinations of 'typical student' did not seem to be as important in relating to consequences as did the variations of proximity found between an overall student reference group, parents, and close friends. Therefore, while there was not a direct linear increase in the magnitude of association as a function of each original level of proximity, clear trends were evident, which informed subsequent analyses, thus providing further insight via hierarchical regression analyses.

In the final model with the revised levels of perceived injunctive norms as well as personal attitudes entered, personal attitudes towards drinking and the perceived approval of close friends still emerged as two strong predictors of consequences. Albeit, both had relatively small effect sizes after controlling for demographics (race, sex, campus), alcohol use, perceived injunctive norms for a typical student (collapsed across all combinations), and perceived parental approval. Further, parental approval was also uniquely associated with consequences after controlling for all the other variables. Finally, the injunctive norm variable of the student composite was also significantly associated with consequences in the regression. Overall however, close friends appear to be among the most impactful reference groups in predicting alcohol-related problems.

The results suggest that when incorporating injunctive norms into intervention and prevention efforts, it may be important to use information about student groups the recipients of the intervention care about. Theoretical perspectives suggest that the power of social norms is determined largely by their salience - operationalized partially as identification with the group in question (Rimal & Real, 2003; 2005). Previous research has found that misperceptions of proximal reference groups, especially for injunctive norms, are more likely to influence drinking behavior than misperceptions of distal reference groups (Borsari & Carey, 2003; Korcuska & Thombs, 2003; Lewis & Neighbors, 2006; Neighbors et al., 2008). And in their meta-analytic review of social norms discrepancies, Borsari and Carey (2003) suggest that closeness to a peer reference group may influence social norms intervention efficacy. However to date, relatively little work has been done to support this idea (for an exception see Reed et al., 2007) and no previous research has been conducted with this model including consequences as the dependent variable.

The current study had alcohol consequences as the outcome variable and examined its relationship to reference groups with varying levels of proximity to the individual student. It yields insight into which reference groups would be worthwhile to target to reduce alcohol harm. First, the noteworthy and unanticipated effect of little distinction between student reference groups holds important implications, particularly in light of recent research with descriptive norms. In a study by Larimer and colleagues (2009), participants did distinguish among different student reference group combinations (based on gender, ethnicity, and residence) when estimating descriptive norms. Findings also demonstrated that perceived norms for more specific combinations of student reference groups were uniquely related to participants' own drinking. As similar findings have been demonstrated with injunctive norms and alcohol use (Neighbors et al., 2008), future research would benefit by replicating the current study with the inclusion of descriptive norms, to assess whether a differential impact on alcohol-related problems would occur as a function of reference group specificity, after controlling for drinking. In the current study, results indicate that utilizing more specific injunctive norms based on characteristics of the "typical student" may not be necessary when providing normative feedback in attempts to reduce negative alcohol-related problems. Instead, results point to the conclusion that given the nature of the relationship between close friends' perceived approval of drinking and consequences, this may prove to be the most promising level to use in interventions targeting injunctive norms and consequences.

Students are likely to consider their close friends to be in-group members: individuals with whom they interact frequently, turn to for advice and emotional support, and trust the most compared to other peers (Donohew, Clayton, Skinner, & Colon, 1999; Kandel & Davies, 1991). Previous research has also noted the superior strength of perceived descriptive (Yanovitzky, Stewart, & Lederman, 2006) and injunctive norms (Neighbors et al., 2008) of friends relative to other, more distal reference groups (i.e. typical student, typical same sex student, Greek member) in the association with drinking behavior. Our findings suggest this is the case for the relationship between injunctive norms and consequences. And while

interventions targeting close friends' injunctive norms appear promising, caution is necessary. First, although misperceptions of typical student and same Greek status injunctive norms are well-documented, students may be less likely to misperceive the attitudes of their close friends. If there are small misperceptions relative to other reference groups, presenting norms for close friends may in some cases simply reinforce heavy drinking. Further, students may believe more strongly in their perceptions about their close friends than they do about their perceptions of other referent groups and so be more resistant to changing their close friend perceptions. Both the documentation of misperceptions of close friend injunctive norms and the strength of which perceptions of close friends are held are avenues for future research.

While the current study highlights the potential importance of general student groups and close friends in experiencing alcohol consequences, it is interesting to note that parental approval also emerged as significantly related to consequences, and that this relationship remained even after controlling for demographics, drinking, and the other levels of peer referents and personal attitudes. These findings support a growing body of research suggesting that parent attitudes towards drinking may continue to influence behavioral choices and the experience of negative consequences, even in college. For example, students whose parents have spoken to them about alcohol before college showed significantly less drinking and tendencies toward drunkenness in college (Turrisi, Jaccard, Taki, Dunnam, & Grimes, 2001). Although it is yet unclear exactly which aspects of parental involvement impact drinking, several studies have suggested that it does so, in part, by reducing the influence of the child's closest friends. D'Amico, et al. (2005), found that closest friend drinking was associated with individual drinking among first-year college students in a control group, but not among those that had received a parental drinking intervention. Wood, Read, Mitchell, & Brand (2004) found that greater parental involvement during the summer before the first year of college was associated with weaker relationships between the child's peers and individual alcohol use and consequences. Similarly, Turrisi, Mastroleo, Mallett, Larimer, & Kilmer (2007) found that the frequency of alcohol-related parental communications was negatively correlated with the number of their child's friends that drink, or drink to get drunk. This evidence of the important role of parents in the lives of college students, especially as it interacts with the well-established influence of peers, suggests a fruitful new direction for future interventions seeking to reduce drinking and consequences.

A strength of the current study is its focus on alcohol-related consequences as the outcome variable as the goal of prevention and intervention efforts is the reduction of consequences both to the individual and the surrounding community. While most studies focus on alcohol consumption and draw a link from consumption to consequences, research suggests that these constructs are distinct (Bonin, McCreary, & Sadava, 2000). In fact, a review found that the correlation between consumption and consequences was only in the small to medium range (Sadava, 1985) suggesting not only that consequences are a unique construct but that explanations for the experiencing of consequences beyond consumption ought to be pursued. The current study not only focuses on the important outcome of consequences, it broadens our understanding of consequences by exploring how the perceived approval of alcohol use/misuse of referent others relates to consequences.

Further, the results are bolstered by the inclusion of two sites with a large sample of participants, assured confidentiality of survey data, and validated measures of norms and consequences. Despite these study strengths, self-report data remains a limitation as students may not accurately report on negative events that transpired as a result of alcohol consumption. However, considerable research indicates that under conditions of confidentiality and when well-validated measures are used, self-report is a reliable and valid method for obtaining information about drinking-related attitudes and behaviors (LaForge, Borsari, & Baer, 2005). Further, cross-sectional data were used in the analyses, which preclude any strong inferences

of causation. Also the study did not incorporate any measure of how close participants identified with each of the reference groups. Future research with consequences as an outcome variable using prospective designs and incorporating group identification measures will be helpful to better understand this relationship.

In conclusion, the present research provides an important evaluation of the influence of injunctive norms specified at varying levels of proximity on alcohol-related consequences. Results suggest that interventions providing injunctive norms feedback for intact groups of known associates/friends (LaBrie, Hummer, Neighbors, & Pedersen, 2008) may in future research be found to outperform those utilizing “typical students” regardless of how precisely defined.

Acknowledgments

This research was supported by National Institute on Alcohol Abuse and Alcoholism Grant R01AA12547.

References

- Alva SA. Self-reported alcohol use of college fraternity and sorority members. *Journal of College Student Development* 1998;39:3–10.
- Armitage CJ, Conner M. Efficacy of the theory of planned behaviour: A meta-analytic review. *British Journal of Social Psychology* 2001;40:471–499. [PubMed: 11795063]
- Baer J. Effects of college residence on perceived norms for alcohol consumption: An examination of the first year in college. *Psychology of Addictive Behaviors* 1994;8:43–50.
- Barnett NP, O’Leary-Tevyaw T, Fromme K, Borsari B, Carey KB, Corbin WR, et al. Brief alcohol interventions with mandated or adjudicated college students. *Alcoholism: Clinical and Experimental Research* 2004;28:966–975.
- Baron R, Kenny D. The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology* 1986;51:1173–1182. [PubMed: 3806354]
- Berkowitz, AD. The social norms approach: Theory, research, and annotated bibliography. [Electronic Version]. 2004. Retrieved March 1, 2009 from http://www.alanberkowitz.com/articles/social_norms.pdf.
- Bonin MF, McCreary DR, Sadava SW. Problem drinking behavior in two community-based samples of adults: Influence of gender, coping, loneliness, and depression. *Psychology of Addictive Behaviors* 2000;14:151–161. [PubMed: 10860114]
- Borsari B, Carey KB. Peer influences on college drinking: A review of the research. *Journal of Substance Abuse* 2001;13:391–424. [PubMed: 11775073]
- Borsari B, Carey KB. Descriptive and injunctive norms in college drinking: A meta-analytic integration. *Journal of Studies on Alcohol* 2003;64:331–341. [PubMed: 12817821]
- Cialdini RB, Reno RR, Kallgren CA. A focus theory of normative conduct: Recycling the concept of norms to reduce littering in public places. *Journal of Personality and Social Psychology* 1990;58:1015–1026.
- Cohen, J.; Cohen, P.; West, SG.; Aiken, LS. *Applied multiple regression/correlation analysis for the behavioral sciences*. 3. Mahwah, NJ: Lawrence Erlbaum Associates; 2003.
- Collins R, Parks G, Marlatt G. Social determinants of alcohol consumption: The effects of social interaction and model status on the self-administration of alcohol. *Journal of Consulting and Clinical Psychology* 1985;53:189–200. [PubMed: 3998247]
- D’Amico EJ, Ellickson PL, Wagner EF, Turrisi R, Fromme K, Ghosh-Dastidar B, et al. Developmental considerations for substance use interventions from middle school through college. *Alcoholism: Clinical and Experimental Research* 2005;29:474–483.
- Dimeff, L.; Baer, J.; Kivlahan, D.; Marlatt, G. *Brief Alcohol Screening and Intervention for College Students (BASICS): A harm reduction approach*. New York, NY US: Guilford Press; 1999.

- Donohew L, Clayton RR, Skinner WF, Colon S. Peer networks and sensation seeking: Some implications for primary socialization theory. *Substance Use & Misuse* 1999;34:1013–1023. [PubMed: 10359219]
- Goldman MS. Expectancy and risk for alcoholism: The unfortunate exploitation of a fundamental characteristic of neurobehavioral adaptation. *Alcoholism: Clinical and Experimental Research* 2002;26:737–746.
- Hingson RW, Heeren T, Winter M, Wechsler H. Magnitude of alcohol-related mortality and morbidity among US college students ages 18-24: Changes from 1998 to 2001. *Annual Review of Public Health* 2005;26:259–279.
- Kandel DB, Davies M. Decline in the use of illicit drugs by high school students in New York State: A comparison with national data. *American Journal of Public Health* 1991;81:1064–1067. [PubMed: 1854004]
- Korcuska JS, Thombs DL. Gender role conflict and sex-specific drinking norms: Relationships to alcohol use in undergraduate women and men. *Journal of College Student Development* 2003;44:204–216.
- LaBrie JW, Hummer JF, Neighbors C, Pedersen ER. Live interactive group-specific normative feedback reduces misperceptions and drinking in college students: A randomized cluster trial. *Psychology of Addictive Behaviors* 2008;22:141–148. [PubMed: 18298241]
- LaForge RG, Borsari B, Baer JS. The utility of collateral informant assessment in college alcohol research: Results from a longitudinal prevention trial. *Journal of Studies on Alcohol* 2005;66:479–487. [PubMed: 16240555]
- Larimer ME, Turner AP, Anderson BK, Fader JS, Kilmer JR, Palmer RS, et al. Evaluating a brief alcohol intervention with fraternities. *Journal of Studies on Alcohol* 2001;62:370–380. [PubMed: 11414347]
- Larimer ME, Turner AP, Mallett KA, Geisner IM. Predicting drinking behavior and alcohol-related problems among fraternity and sorority members: Examining the role of descriptive and injunctive norms. *Psychology of Addictive Behaviors* 2004;18:203–212. [PubMed: 15482075]
- Lewis MA, Neighbors C. Gender-specific misperceptions of college student drinking norms. *Psychology of Addictive Behaviors* 2004;18:334–339. [PubMed: 15631605]
- Lewis MA, Neighbors C. Social norms approaches using descriptive drinking norms education: A review of the research on personalized normative feedback. *Journal of American College Health* 2006;54:213–218. [PubMed: 16450845]
- Marlatt GA, Baer JS, Kivlahan DR, Dimeff LA, Larimer ME, Quigley LA, et al. Screening and brief intervention for high-risk college student drinkers: Results from a 2-year follow-up assessment. *Journal of Consulting and Clinical Psychology* 1998;66:604–615. [PubMed: 9735576]
- Mattern JL, Neighbors C. Social norms campaigns: Examining the relationship between changes in perceived norms and changes in drinking levels. *Journal of Studies on Alcohol* 2004;65:489–493. [PubMed: 15376823]
- Meng X, Rosenthal R, Rubin D. Comparing correlated correlation coefficients. *Psychological Bulletin* 1992;111:172–175.
- Nagoshi CT. Perceived control of drinking and other predictors of alcohol use and problems in a college student sample. *Addiction Research & Theory* 1999;7:291–306.
- Neighbors C, Dillard AJ, Lewis MA, Bergstrom RL, Neil TA. Normative misperceptions and temporal precedence of perceived norms and drinking. *Journal of Studies on Alcohol* 2006;67:290–299. [PubMed: 16562412]
- Neighbors C, Lee CM, Lewis MA, Fossos N, Larimer ME. Are social norms the best predictor of outcomes among heavy-drinking college students? *Journal of Studies on Alcohol and Drugs* 2007;68:556–565. [PubMed: 17568961]
- Neighbors C, O'Connor RM, Lewis MA, Chawla N, Lee CM, Fossos N. The relative impact of injunctive norms on college student drinking: The role of reference group. *Psychology of Addictive Behaviors* 2008;22:576–581. [PubMed: 19071984]
- Perkins HW. Social norms and the prevention of alcohol misuse in collegiate contexts. *Journal of Studies on Alcohol* 2002:164–172.
- Perkins HW, Haines MP, Rice R. Misperceiving the college drinking norm and related problems: A nationwide study of exposure to prevention information, perceived norms and student alcohol misuse. *Journal of Studies on Alcohol* 2005;66:470–478. [PubMed: 16240554]

- Perkins HW, Meilman PW, Leichter JS, Cashin JR, Presley CA. Misperceptions of the norms for the frequency of alcohol and other drug use on college campuses. *Journal of American College Health* 1999;47:253–258. [PubMed: 10368559]
- Perkins HW, Wechsler H. Variation in perceived college drinking norms and its impact on alcohol abuse: A nationwide study. *Journal of Drug Issues* 1996;26:961–974.
- Presley CA, Meilman PW, Cashin JR. Weapon carrying and substance abuse among college students. *Journal of American College Health* 1997;46:3–8. [PubMed: 9248236]
- Reed MB, Lange JE, Ketchie JM, Clapp JD. The relationship between social identity, normative information, and college student drinking. *Social Influence* 2007;2:269–294.
- Rehm J, Room R, Graham K, Monteiro M, Gmel G, Sempos CT. The relationship of average volume of alcohol consumption and patterns of drinking to burden of disease: An overview. *Addiction* 2003;98:1209–1228. [PubMed: 12930209]
- Rimal RN, Real K. Understanding the influence of perceived norms on behaviors. *Communication Theory* 2003;13:184–203.
- Rimal RN, Real K. How behaviors are influenced by perceived norms: A test of the theory of normative social behavior. *Communication Research* 2005;32:389–414.
- Sadava SW. Problem behavior theory and consumption and consequences of alcohol use. *Journal of Studies on Alcohol* 1985;46:392–397. [PubMed: 4068718]
- Sheppard BH, Hartwick J, Warsaw PR. The theory of reasoned action: A meta-analysis of past research with recommendations for modifications and future research. *Journal of Consumer Research* 1988;15:325–343.
- Terry DJ, Hogg MA. Group norms and the attitude-behavior relationship: A role for group identification. *Personality and Social Psychology Bulletin* 1996;22:776–793.
- Trafimow D. The importance of attitudes in the prediction of college students' intentions to drink. *Journal of Applied Social Psychology* 1996;26:2167–2188.
- Trafimow D, Finlay KA. The importance of subjective norms for a minority of people: Between-subjects and within-subjects analyses. *Personality and Social Psychology Bulletin* 1996;22:820–828.
- Turner AP, Larimer ME, Sarason IG. Family risk factors for alcohol-related consequences and poor adjustment in fraternity and sorority members: Exploring the role of parent-child conflict. *Journal of Studies on Alcohol* 2000;61:818–826. [PubMed: 11188487]
- Turrisi R, Jaccard J, Taki R, Dunnam H, Grimes J. Examination of the short-term efficacy of a parent intervention to reduce college student drinking tendencies. *Psychology of Addictive Behaviors* 2001;15:366–372. [PubMed: 11767270]
- Turrisi R, Mastroleo NR, Mallett KA, Larimer ME, Kilmer JR. Examination of the mediational influences of peer norms, environmental influences, and parent communications on heavy drinking in athletes and nonathletes. *Psychology of Addictive Behaviors* 2007;21:453–461. [PubMed: 18072827]
- Wechsler H, Lee JE, Kuo M, Lee H. College binge drinking in the 1990s: A continuing problem: Results of the Harvard School of Public Health 1999 College Alcohol Study. *Journal of American College Health* 2000;48:199–210. [PubMed: 10778020]
- Wechsler H, Lee JE, Kuo M, Seibring M, Nelson TF, Lee H. Trends in college binge drinking during a period of increased prevention efforts: Erratum. *Journal of American College Health* 2002;51:37–37.
- Wechsler H, Lee JE, Nelson TF, Lee H. Drinking levels, alcohol problems and secondhand effects in substance-free college residences: Results of a national study. *Journal of Studies on Alcohol* 2001;62:23–31. [PubMed: 11271961]
- White HR. Reduction of alcohol-related harm on United States college campuses. The use of personal feedback interventions. *International Journal of Drug Policy* 2006;17:310–319.
- White HR, Jackson K. Social and psychological influences on emerging adult drinking behavior. *Alcohol Research & Health* 2004;28:182–190.
- White HR, Labouvie EW. Towards the assessment of adolescent problem drinking. *Journal of Studies on Alcohol* 1989;50:30–37. [PubMed: 2927120]
- Wood MD, Nagoshi CT, Dennis DA. Alcohol norms and expectations as predictors of alcohol use and problems in a college student sample. *American Journal of Drug and Alcohol Abuse* 1992;18:461–476. [PubMed: 1449125]

- Wood MD, Read JP, Mitchell RE, Brand NH. Do parents still matter? Parent and peer influences on alcohol involvement among recent high school graduates. *Psychology of Addictive Behaviors* 2004;18:19–30. [PubMed: 15008682]
- Wood MD, Read JP, Palfai TP, Stevenson JF. Social influence processes and college student drinking: The meditational role of alcohol outcome expectations. *Journal of Studies on Alcohol* 2001;62:32–43. [PubMed: 11271962]
- Yanovitzky I, Stewart LP, Lederman LC. Social distance, perceived drinking by peers, and alcohol use by college students. *Health Communication* 2006;19:1–10. [PubMed: 16519587]

Table 1
Zero-order correlations between alcohol problems, alcohol use, and injunctive norm constructs

Construct	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Alcohol problems	--													
2. Alcohol use (drinks per week)	.51*	--												
3. Typical student	.05*	.01	--											
4. Typical same sex student	.07*	.08*	.86*	--										
5. Typical same race student	.08*	.09*	.85*	.88*	--									
6. Typical same Greek status student	.14*	.17*	.81*	.80*	.84*	--								
7. Typical same sex and same race student	.10*	.13*	.81*	.90*	.93*	.86*	--							
8. Typical same sex and same Greek status student	.13*	.18*	.75*	.83*	.81*	.91*	.89*	--						
9. Typical same race and same Greek status student	.14*	.18*	.76*	.77*	.86*	.92*	.89*	.91*	--					
10. Typical same sex, same race, and same Greek status student	.14*	.21*	.70*	.80*	.83*	.87*	.90*	.94*	.93*	--				
11. Typical student composite	.12*	.14*	.88*	.92*	.94*	.94*	.96*	.94*	.94*	.93*	--			
12. Parents	.19*	.22*	.31*	.33*	.35*	.33*	.36*	.34*	.34*	.35*	.36*	--		
13. Close friends	.30*	.41*	.49*	.52*	.51*	.53*	.54*	.54*	.54*	.54*	.56*	.49*	--	
14. Self	.41*	.57*	.36*	.39*	.40*	.44*	.44*	.45*	.45*	.47*	.45*	.55*	.76*	--

Note.

* $p < .001$

Table 2
Means and Zero-order correlations between injunctive norms and alcohol-related problems

Variables	Mean	SD	Correlation with alcohol problems
Alcohol problems	4.33	7.56	--
Injunctive norms: reference groups			
Typical student	3.06	0.92	0.05 _a **
Typical same sex student	3.03	0.93	0.07 _a ***
Typical same race student	3.01	0.90	0.08 _a ***
Typical same Greek status student	3.09	0.92	0.14 _{ab} ***
Typical same sex and same race student	3.00	0.91	0.10 _{ab} ***
Typical same sex and same Greek status student	3.03	0.95	0.13 _{ab} ***
Typical same race and same Greek status student	3.03	0.95	0.14 _{ab} ***
Typical same sex, same race, and same Greek status student	2.98	0.97	0.14 _{ab} ***
Typical student composite	3.03	0.87	0.12 _{ab} ***
Parents	1.70	0.72	0.19 _{bc} ***
Close friends	2.68	1.04	0.30 _{cd} ***
Self	2.18	0.93	0.41 _{cd} ***

Note. Correlations which do not share a subscript are significantly different from each other.

*
 $p < .05$;

**
 $p < .01$;

 $p < .001$

Table 3
Regression results evaluating alcohol-related problems as a function of injunctive norms defined at increasing levels of specificity

Predictor (Injunctive norms reference group)	B	SE	B	B	d
Step 1 R ² = .019***; R ² Δ = .019***					
Sex	-1.51	0.26	-0.10***	-0.20	
Campus	1.23	0.25	0.08***	0.16	
Asian	-0.01	0.40	0.00	0.00	
Race other than white	-0.66	0.30	-0.04*	-0.07	
Step 2 R ² = .270***; R ² Δ = .251***					
Alcohol use (drinks per week)	0.46	0.013	0.53***	1.17	
Step 3 R ² = .272***; R ² Δ = .002***					
Typical student	0.42	0.12	0.05***	0.12	
Step 4 R ² = .282***; R ² Δ = .010***					
Parents	0.46	0.17	0.04**	0.09	
Close friends	0.75	0.14	0.10***	0.18	
Step 5 R ² = .292***; R ² Δ = .010***					
Self	1.46	0.20	0.18***	0.24	

Note. All reference groups referred to other students on one's own campus. *d* = Cohen's *d*, calculated using the formula $d = 2t/\sqrt{df}$.

* $p < .05$;

** $p < .01$;

*** $p < .001$