Examining the Associations among Severity of Injunctive Drinking Norms, Alcohol Consumption, and Alcohol-Related Negative Consequences: The Moderating Roles of Alcohol Consumption and Identity

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Abstract

The present study examined a range of injunctive norms for alcohol use and related consequences from less severe behaviors (e.g., drinking with friends) to more severe behaviors (e.g., drinking enough alcohol to pass out), and their relationship with alcohol consumption and alcohol-related negative consequences among college students. In addition, this research aimed to determine if these relationships between injunctive norms and consequences were moderated by alcohol consumption and level of identification with the typical same-sex college student. A random sample ($N = 1,002$) of undergraduates (56.9% female) completed a Web–based survey that was comprised of measures of drinking behavior, perceived approval of drinking behaviors that ranged in severity (i.e., injunctive norms), and level of identification with the typical same-sex college student. Results suggest that the association between negative consequences and injunctive drinking norms depend on one's own drinking behavior, identification with other students, and the severity of the alcohol use and related consequences for which injunctive norms are assessed. Findings are discussed in terms of false consensus and false uniqueness effects, and deviance regulation perspectives. Implications for preventative interventions are discussed.

Keywords

social norms; injunctive norms; alcohol-related negative consequences; college student drinking; identity

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Previous research examining perceived injunctive drinking norms (i.e., perceived approval or acceptance of drinking behavior) has primarily focused on extremely negative behaviors, such as driving a car after drinking and drinking alcohol daily. The present study extends social norms literature by examining a range of perceived injunctive norms for alcohol use and related consequences from less severe behaviors (e.g., playing drinking games, drinking with friends) to more severe behaviors (e.g., drinking enough alcohol to pass out, drinking alone), and their relationship with alcohol consumption and alcohol-related negative consequences. In addition,

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this research aimed to determine if the associations between less and more severe injunctive drinking norms and alcohol-related negative consequences were moderated by alcohol consumption and level of identification with the typical same-sex college student.

Social Norms

Perceived descriptive drinking norms refer to the perceived prevalence of drinking behavior (e.g., the perceived number of drinks per week consumed and the frequency of use by the typical same-sex college student). Prior research on descriptive drinking behavior has primarily focused on normative perceptions for frequency and quantity of alcohol use, rather than alcohol-related negative consequences, and has consistently demonstrated that students who report higher perceived descriptive drinking norms also report consuming heavier amounts of alcohol and more frequently experiencing alcohol-related negative consequences (Borsari & Carey, 2001; 2003; Lewis & Neighbors, 2004; Neighbors, Dillard, Lewis, Bergstrom, & Neil, 2006).

Perceived injunctive drinking norms are perceptions of how much others approve of or accept drinking behavior (e.g., the perceived approval or acceptance of drinking and driving by the typical same-sex college student). Most often, research has examined perceived injunctive drinking norms for more severe drinking behaviors and alcohol-related negative consequences, such as drinking alcohol daily or drinking enough alcohol to pass out (Baer, 1994; Chawla, Neighbors, Lewis, Lee, & Larimer, 2007; Larimer, Turner, Mallett, & Geisner, 2004; Neighbors, Lee, Lewis, Fossos, & Larimer, 2007; Neighbors et al., 2008). A limitation of having a concentrated focus on severe alcohol use and related consequences is that the majority of students indicate low approval or low acceptance for these severe drinking behaviors. Examining a range of alcohol use and negative consequences from less severe to more severe would allow for greater variance of perceived approval for these behaviors. One of the aims of the present paper is to extend this literature by examining a range of alcohol use and negative consequences from less severe (e.g., drinking to have fun) to more severe (e.g., driving a car after drinking) drinking behavior.

Additional research for injunctive drinking norms is needed, as prior research in this area has been found to be less consistent than the research relating to descriptive drinking norms. For example, consistent with descriptive norms literature, research examining injunctive drinking norms for important, more proximal others (i.e., close friends and parents) indicates that greater perceived approval of injunctive drinking norms are positively related to heavy drinking and alcohol-related negative consequences among college students (Chawla et al., 2007; Kuther & Higgins-D'Alessandro, 2003; Neighbors et al., 2007). However, contrary to descriptive norms literature, when examining the relationship between drinking behavior and perceived injunctive norms for less important, more distal others (i.e., typical college student) findings indicate that greater perceived approval of injunctive norms are negatively associated with alcohol consumption and alcohol-related negative consequences (Chawla et al., 2007; Neighbors et al., 2008). While these studies suggest that the relationship between perceived injunctive drinking norms and drinking behavior may depend on the reference group being examined (i.e., important vs. less important normative referents; proximal vs. distal normative referents), it also suggests that identification with the normative referent group may play an important role.

Deviance Regulation Theory, False Consensus, and False Uniqueness

According to deviance regulation theory (Blanton & Christie, 2003), behavioral decisions are made within a social frame of reference that varies depending on the situation or context, impression management goals, and social identity. Within these social frames, certain behaviors, such as drinking, are perceived as normative or counter-normative. When a behavior

is typically engaged in by an individual, and the behavior is the typical choice that similar, important others would make in that situation, the behavior is perceived as normative by the individual. A behavior is counter-normative when it is not typically engaged in by an individual and is not the typical choice that similar, important others would make in that situation. This can impact norm perception since, as Blanton and Christie (2003) note, one who engages in counter-normative actions stands out and draws attention from others, while one who engages in normative actions "blends into the perceptual ground (p. 117)." Blanton and Christie (2003) suggest that individuals are motivated to maintain positive identities that aid in securing positive approval from important others. Individuals attempt to maintain a positive self image by deviating from social norms in desirable ways (i.e., uniqueness striving) and by not deviating from social norms in undesirable ways (i.e., conformity striving). Thus, related to the present study, social frames may help mange one's positive image as related to drinking behavior to the extent that perceived approval of drinking behaviors are positively associated with one's own drinking behavior. However, according to deviance regulation theory, this should primarily be true for drinking behaviors that are not indicative of negative deviation from social norms (i.e., less severe drinking behaviors). Conversely, perceived approval of severe drinking behaviors that are indicative of negative deviation from the norm may be *negatively* associated with one's own drinking behaviors (i.e., more severe drinking behaviors).

Deviance regulation theory offers a framework for when false consensus and false uniqueness may occur. False consensus (Marks & Miller, 1987; Neighbors et al., 2006; Ross, Greene, & House, 1977) and false uniqueness (Suls, Wan, & Sanders, 1988) effects provide a perspective from which to consider the potential influences of social norms related to drinking behavior. According to false consensus, individuals who engage in behaviors tend to assume that their own behaviors and attitudes are more similar to others than is actually the case. For example, students who engage in drinking behavior are likely to overestimate the drinking behavior of their peers. Consistent with deviance regulation theory, false consensus should be most evident for normative behaviors that are viewed positively (i.e., associations between perceived approval and drinking should be strongest for less severe consequences). The false uniqueness effect occurs when individuals who engage in behaviors are motivated to distinguish themselves by standing out from others on positive dimensions. For example, students who abstain from alcohol or who do not engage in drinking behavior are likely to underestimate abstinence or low-risk drinking behavior of their peers, falsely perceiving that their own behavior is more unique than it actually is. Consistent with deviance regulation theory, when deviance is desirable, false uniqueness should occur if the degree to which the behavior is actually unique is misperceived. Based on these perspectives, the relationship between both less severe and more severe injunctive normative information with alcohol-related negative consequences may depend on one's alcohol consumption. As with the literature reviewed above, these perspectives indicate that level of identification with the normative referent may play an important role when examining the relationship between injunctive norms in relation to alcohol use and related negative consequences.

Identity

Research conducted by Neighbors and colleagues (2009) found that the relationship between perceived descriptive drinking norms and alcohol consumption was moderated by level of identification with the normative referent (i.e., typical same-sex student, typical same-race student, and typical same-Greek status student). Results were similar when examining these relationships for all three normative referent groups, such that descriptive normative perceptions for the normative referent were more strongly associated with drinking when participants reported feeling closer (i.e., stronger identification) to the normative referent.

Reed and colleagues (2007) conducted a similar study examining the relationships among identity and perceived severe injunctive drinking norms (e.g., drank alcohol daily, drove a car after drinking) for friends, other university peers, and Greek members with alcohol consumption. When examining these relationships among friends, perceived injunctive drinking norms were positively associated with consuming more drinks per occasion, which was especially true as identification with friends increased. For other university peers, identification was associated with drinking only for those who perceived other university students as more approving of drinking behavior (medium and high levels of approval). For Greek normative referents, identification was associated with drinking only for those who perceived Greek members as highly approving of drinking behavior.

Together, findings from Neighbors and colleagues (2009) and Reed and colleagues (2007) indicate that the relationship between both perceived descriptive and injunctive normative information with alcohol consumption may depend on how strongly students identify with the normative referent. However, research has yet to examine the relationship among perceived injunctive drinking norms, identity, and alcohol-related negative consequences. In addition, research has yet to examine if these relationships vary by level of perceived injunctive drinking norms (i.e., less severe vs. more severe) and level of alcohol consumption.

Moderators of Social Norms and Own Behavior

Factors that should theoretically affect the association between perceived approval of drinking behaviors and one's own level of problematic drinking include one's typical drinking behavior and identification with the normative referent group. Prior research has shown that non-drinkers are a minority group on college campuses (Substance Abuse and Mental Health Services Administration [SAMHSA], 2008; Wechsler, Lee, Kuo, & Lee, 2000). For non-drinkers, drinking behaviors may be more distinctive or noticeable; thus, non-drinkers may be more strongly influenced by perceived approval of drinking behaviors, both severe and less severe. Whereas for moderate and heavy drinkers, drinking may be less distinctive and less noticeable; therefore, they may be less influenced by perceived approval of drinking behaviors, regardless of severity. Empirical support indicating that drinking is more distinctive among lighter drinkers can be derived from work conducted by Carey and colleagues (Carey, Borsari, Carey, & Maisto, 2006), in which the number of drinks consumed per week was found to be negatively associated with self-other discrepancies for both descriptive and injunctive drinking norms, such that lower levels of drinking were associated with larger discrepancies between personal alcohol use and perceived alcohol use of others, as well as between personal approval of drinking behavior and the perceived approval of drinking behavior of others. This may translate to a stronger relationship between perceived norms and drinking among lighter drinkers who are likely to be more sensitive to discrepancies between their own behavior and there perceptions of other students' approval. Thus, it is hypothesized that both less and more severe injunctive drinking norms may have a stronger association with alcohol-related negative consequences among lighter drinkers. Whereas for heavier drinkers, the association between both less and more severe injunctive drinking norms with alcohol-related negative consequences may be weaker.

Moreover, identification with one's peers may moderate the perceived approval of less severe drinking behaviors with one's own drinking behavior and alcohol-related negative consequences. For individuals who find it desirable to fit in with their peers regarding drinking behaviors and attitudes (i.e., high identification), one would not be expected to socially deviate. For example, if an individual perceives that his/her peers drink heavily and strongly approve of drinking behavior, according to deviance regulation theory, one would not deviate as it would be socially undesirable to stand out by engaging in counter-normative behaviors or attitudes – i.e., not drinking and having low approval of drinking behavior. However, if one

finds it desirable to stand out from others regarding drinking behavior (i.e., low identification), they may be inclined to deviate from the normative actions of that group. For instance, if an individual who does not identify with other students perceives that those students consume heavy amounts of alcohol and strongly approve of heavy drinking behaviors, then she/he should be more likely to choose to deviate by not drinking and/or endorsing lower approval of drinking behavior. By standing out from other students in general, this action may increase their social identity with important others with whom they do identify. Thus, when deciding to engage in drinking behavior, one's attitudes and behaviors may be based on the severity of the drinking behavior (i.e., less severe vs. more severe) and on one's own typical drinking behavior.

The Present Study

Based on the above considerations, the present study aimed to (1) examine the relationships between less and more severe injunctive drinking norms with alcohol consumption and alcohol-related negative consequences and to (2) determine if these relationships were moderated by alcohol consumption and level of identification with the typical same-sex student. We expected less severe injunctive drinking norms to be positively associated with alcohol consumption and alcohol-related negative consequences, and more severe injunctive drinking norms to be negatively associated with alcohol consumption and alcohol-related negative consequences. Finally, we expected the relationships between less and more severe injunctive drinking norms and alcohol-related consequences to be moderated by alcohol consumption and level of identification, such that these relationships would be stronger for those who typically consume less alcohol and who identified less closely with the typical same-sex student.

Method

Participants and Procedures

Names and contact information for a random sample ($N = 2,000$) of undergraduates aged 18 to 30 were obtained from the university registrar's office. Students were mailed and emailed invitations to participate in a larger study examining the association between alcohol and sexual behavior, which consisted of a 40-minute Web-based survey assessing alcohol consumption, alcohol-related negative consequences, perceived descriptive drinking norms, perceived injunctive drinking norms, identification with the typical same-sex student, and other psychosocial constructs. Interested students read an online information statement that provided all components necessary for informed consent, and those who chose to participate were directed to the main study survey. A total of 1,002 students (56.9% female) agreed to participate, and of those 958 (95.6%) completed the survey. The mean age of the sample was 20.61 ($SD = 2.07$). Ethnic composition of the participants was 60.0% Caucasian, 26.1% Asian, 8.7% multi-racial and 5.2% other. A small proportion of the sample identified as Hispanic (4.9%). There was no significant difference in ethnic composition (Caucasian, Asian, and other) based on whether students decided to participate or not, $\chi^2 (2, n = 1901) = 3.20$, $p = ns$. In regards to gender, our sample included 56.9% women and 43.1% men, whereas the invited sample was 50.3% women and 49.7% men. Thus, women were more likely to participate than men, $\chi^2 (1, n = 2000) = 37.53$, $p < .001$. Compared to the demographics of the undergraduate population at the University, participants were more likely to be women, $\chi^2 (1, n = 28570) = 10.50$, $p < .01$, and Caucasian, $\chi^2 (1, n = 28570) = 31.20$, $p < .001$. Participants did not differ from the larger University population with respect to their likelihood of being Asian, $\chi^2 (1, n = 28570) = 0.64$, $p = ns$, and were less likely to be of ethnicity other than Caucasian or Asian, $\chi^2 (1, n = 28570) = 49.17$, $p < .001$. Participants received $20 for survey completion. All procedures were reviewed and approved by the University's institutional review board. In addition, a Federal Certificate of Confidentiality was obtained for this research.

Measures

Alcohol consumption—Typical number of drinks consumed per week was assessed with a modified version of the Daily Drinking Questionnaire (DDQ; Collins, Parks, & Marlatt, 1985). Participants were asked: "Consider a typical week during the last three months. How much alcohol, on average (measured in number of drinks), do you drink on each day of a typical week?" A response table with each day of the week was presented and the participants filled in how much they typically drink on each day of the week. Scores were computed by summing the number of drinks the participants reported drinking on each day of the typical week.

Alcohol-related negative consequences were assessed with a modified version of the Young Adult Alcohol Problems Screening Test (YAAPST; Hurlbut & Sher, 1992), which measures personal and social problems related to drinking. The YAAPST has good internal consistency and test-retest reliability (Hurlbut & Sher, 1992). Internal reliability for the YAAPST in this sample was .89. Example items include "Have you ever been pressured or forced to have sex with someone because you were too drunk to prevent it?" Item responses for this scale were modified from the past year to the past three months to be consistent with drinking behavior. In addition, six items related to sexual consequences were added (Wood, Read, Palfai, & Stenvenson, 2001; Larimer, Lydum, Anderson & Turner, 1999). Participants rated ten responses on a scale from 0 *(No, never)* to 9 *(Yes, 40 or more times in the past three months),* thirteen responses on a scale from *0 (No, never)* to 4 *(Yes, 3 or more times in the past three months),* and four responses on a scale from *0 (No, never)* to 2 *(Yes, in the past three months).* Responses to the 27 items were summed to create a final score representing alcohol-related negative consequences.

Descriptive normative perceptions for drinking were measured by a modified version of the Drinking Norms Rating Form (DNRF; Baer, Stacy, & Larimer, 1991; Lewis & Neighbors, 2004). The gender-specific version (Lewis & Neighbors, 2004) assesses perceived typical weekly drinking in which participants fill in the average number of standard drinks they think the typical (male/female) student on campus consumes for each day of the week over the past three months. Responses were coded to represent descriptive normative perceptions for the typical same-sex student. Scores represent perceptions of the average number of drinks consumed each week over the previous three months for the typical same-sex student.

Injunctive normative perceptions for less and more severe drinking behaviors were assessed with a modified version of Baer's (1994) measure. This measure was modified by adding additional drinking behavior items that assessed less and more severe injunctive drinking norms for alcohol use and alcohol-related negative consequences. These items were selected to represent similar items from the Young Adult Alcohol Problems Screening Test (Hurlbut & Sher, 1992; playing drinking games) and to represent reasons for drinking (Cooper, 1994; drinking to blow off steam, drinking to meet people, drinking with friends, drinking to have fun, drinking to get drunk). Additional items were generated by the authors (never drinking, drinking alcohol, drinking under the age of 21, drinking shots, drinking alone). Students completed 15 items (Table 1) that assessed perceived typical male/female student acceptance of specific drinking behaviors. Students were asked "How acceptable (or unacceptable) do you think the typical male/female student finds each of the following behaviors? Responses ranged from 1 = *unacceptable* to 7 = *acceptable*. Responses were coded to represent perceived injunctive drinking normative perceptions for the typical same-sex student.

To assess structure of the 15 injunctive drinking behavior items, an exploratory factor analysis (EFA) was conducted extracting principal components followed by promax rotation. Promax rotation, an oblique rotation method, was chosen because we anticipated that emerged factors would be correlated. A two-factor solution emerged that appeared to distinguish less severe and more severe drinking behaviors. Specifically, two eigenvalues were greater than 1 (6.94

for less severe drinking behavior items and 2.42 for more severe drinking behavior items), with the next highest eigenvalue equaling .97. The two-factor solution accounted for 62.40% of the total variance of the items. Factor loadings and item means are presented in Table 1. Findings from the EFA indicated that all 15 items had strong factor loadings, ranging from .49 to .86. Results indicated that the less severe drinking behavior scale (α = .93) and the more severe drinking behavior scale had good internal consistency (α = .75).

Identification with typical male/female reference group—The Inclusion of Other in the Self (IOS) scale (Aron, Aron, & Smollan, 1992; Tropp & Wright, 2001) measures identification of interrelatedness or closeness with the typical male/female student. Participants were presented a series of seven Venn diagrams ranging from non-overlapping circles to completely overlapping circles and asked to select which diagram best represented their level of identification with the typical male/female student. Reponses were coded to represent identification with the typical same-sex student. The IOS has demonstrated good test-retest reliability, and good concurrent, discriminant, and construct validity (Tropp & Wright, 2001).

Results

Data Analysis

Preliminary analyses revealed non-normal distributions for both alcohol consumption ($S = 2.20$, $K = 9.44$) and alcohol-related negative consequences ($S = 1.70$, $K = .21$). For both variables the distribution was positively skewed approximating a negative binomial distribution with the exception of a disproportionately large number of zero values for alcohol consumption (33.0%) and alcohol-related negative consequences (22.5%). Thus, zero-inflated binomial regression (ZINB) was selected as the primary analysis strategy (Atkins & Gallop, 2007; Heilbron, 1994; Hilbe, 2007; Simons, Neal, & Gaher, 2006).

Zero-inflated count models are accompanied by simultaneous tests for two dimensions of a distribution. The logistic portion of the model examines the likelihood of the observation being a zero-value, such that it predicts the excess zeros (i.e., zero-scores that exceed what would be expected in a negative binomial distribution). The second set of tests focuses on the count portion of the model, in this case the negative binomial distribution. In these data, this corresponds to evaluating predictors of the number of drinks or negative consequences and includes positive integers and zero. Predictors can be the same or different for the logistic and counts portions of the model. In the present analyses, we included the same predictors for both dimensions when examining alcohol consumption. Drinks per week was included in the counts portion of the model when examining alcohol-related negative consequences but was excluded from the logistic portion of the model. Most participants who reported no drinking also reported no consequences (though not strictly so as drinking was assessed as typical drinks per week whereas consequences were over the last three months). Trying to include drinks per week as a covariate of the zero-inflation portion of consequences led to problems with separation (i.e., when a single or combination of covariates perfectly predict the outcome in logistic regression, coefficients and standard errors become unstable; for a description of the problem and Bayesian methods to address it, see Heinze & Schemper, 2002). Hence, drinks per week was only included as a covariate for the counts portion of the negative consequences outcome.

Two ZINB regression analyses were performed. The first analysis evaluated typical drinks per week as the dependent variable and the second analysis evaluated alcohol-related negative consequences as the dependent variable. Both analyses were hierarchical with main effects entered at Step 1 and product terms in subsequent steps to evaluate interactions. In the first analysis, we examined interactions between identity and injunctive drinking norms for drinks per week. In the second analysis, we examined interactions among identity, injunctive drinking norms, and drinks per week for alcohol-related negative consequences. Gender and perceived

descriptive drinking norms were included in both analyses as covariates based on their previous associations with alcohol consumption, alcohol-related negative consequences, and injunctive drinking norms (Lewis & Neighbors, 2004; Neighbors et al., 2007; O'Malley & Johnston, 2002; Read, Wood, Davidoff, McLacken, & Campbell, 2002). However, as these variables were not a primary focus of this paper, we did not test interactions with these variables. In the first analysis, at Step 1, we examined drinks per week (Drinking) as a function of gender, level of identification with the same-sex typical student (Identity), perceived descriptive drinking norms (DNorms), perceived injunctive drinking norms for less severe drinking behaviors (INorms Low Severity), and perceived injunctive drinking norms for more severe drinking behaviors (INorms High Severity). At Step 2, we examined interactions (i.e. two-way product terms) between Identity and both INorms Low Severity and INorms High Severity. The second ZINB regression analysis evaluated alcohol-related negative consequences as the dependent variable. In the counts portion of the model, at Step 1, alcohol-related negative consequences were evaluated as a function of Drinking, gender, Identity, DNorms, INorms Low Severity, and INorms High Severity. At Step 2, we evaluated two-way product terms between Drinking and both INorms Low Severity and INorms High Severity and between Identity and both INorms Low Severity and INorms High Severity. At Step 3, we added the two three-way product terms among Drinking, Identity, and both INorms Low Severity and INorms High Severity. The logistic portion of the model included the same terms at Steps 1 and 2 as the counts portion of the model with the exception of Drinking and all relevant interaction terms. All predictors were mean centered to facilitate interpretation of parameter estimates (Aiken & West, 1991; Cohen, Cohen, West, & Aiken, 2003).

Descriptive Information

Means, standard deviations, and zero-order correlations are presented in Table 2. Correlations indicated that perceived less severe injunctive drinking norms were positively associated with identifying with the typical same-sex student, consuming more alcohol, and experiencing more negative consequences whereas perceived more severe injunctive drinking norms were negatively related to these three variables. Identifying with the typical same-sex student was also positively related to alcohol consumption and negative consequences.

ZINB Regression Results Evaluating Drinks per Week

Results of the ZINB regression evaluating drinks per week as the dependent variable are presented in Table 3. Results for the logistic portion of the model represent unique associations between each predictor and expected zero-scores, and are presented at the top of Table 3. Results for the counts portion of the model represent unique associations between each predictor and the number of drinks (count) consumed in a typical week and are presented at the bottom of Table 3.

The likelihood ratio for the full ZINB model was $X^2 (10) = 298.94$, $p < .001$; maximum likelihood $R^2 = .27$, which indicated that the overall model was significant. Findings indicated strong support for the ZINB model over other possible count models. The Vuong test for non-nested models supported the use of a zero-inflated model over a standard negative binomial model, $z = 5.88$, $p < .001$. The LR test of overdispersion was also significant (LR, $X^2 (1) = 1779.84$, $p < .001$, which indicates that a zero-inflated Poisson model would not be appropriate.

Logistic results—Results of the logistic portion of the model indicated that gender was not significantly associated with zero-inflation (i.e., zeroes in excess of what is predicted by the negative binomial regression). DNorms, Identity, and INorms Low Severity were each negatively associated with zero-inflation indicating that those reporting not drinking in the last three months were more likely to perceive other students as consuming less alcohol, identify less closely with the typical same-sex student, and perceive the typical same-sex student as

less approving of less severe drinking behavior. In contrast, there was a significant positive association between INorms High Severity and zero-inflation, indicating that those reporting not drinking in the last three months perceived the typical same-sex student as more approving of the more severe drinking behaviors. Results at Step 2 indicated that Identity did not interact with either low or high severity injunctive drinking norms variables in predicting zero-inflation.

Count results—Results from the counts portion of the model were complimentary to results from the logistic portion of the model. DNorms, Identity, and INorms Low Severity ($p = .054$) were each positively associated with number of drinks consumed in a typical week whereas INorms High Severity was negatively associated with drinks per week. In contrast to the logistic results revealing no differences between men and women in zero-scores, men reported consuming more drinks per week than women. At Step 2, neither low nor high severity injunctive drinking norms variables interacted with Identity.

ZINB Regression Results Evaluating Alcohol-Related Negative Consequences

ZINB regression results for alcohol-related negative consequences are presented in Table 4. The likelihood ratio for the full ZINB model was $X^2 (11) = 556.37$, $p < .001$. The maximum likelihood $R^2 = .45$, which indicated that the overall model was significant. Findings indicated support for the ZINB model over other possible count models. The Vuong test for non-nested models supported the use of a zero-inflated model over a standard negative binomial model, $z = 7.56$, $p < .001$. The LR test of overdispersion was also significant (LR, $X^2 (1) = 2115.95$, $p < .001$, indicating support for NINB over a zero-inflated Poisson model.

Logistic results—Logistic results are presented at the top of Table 4 and represent unique associations between each predictor and zero-scores (always zero) for negative consequences. Results at Step 1 revealed that Identity, DNorms, and INorms Low Severity were each uniquely and negatively associated with zero-scores. Students who reported no alcohol-related negative consequences reported less identification with the typical same-sex student, and perceived the typical same-sex student as consuming less alcohol and as less approving of less severe drinking behavior. Consistent with the above results for drinks per week, expected zero-values was positively associated with viewing the typical same-sex student as *more approving* of relatively severe drinking behavior (i.e., INorms High Severity). Gender did not uniquely predicted zero-scores.

Results at Step 2 revealed significant two-way interactions between Identity and INorms Low Severity and INorms High Severity. Interactions were plotted following procedures described by Aiken and West (1991) and others (Cohen et al., 2002; Jaccard & Turrisi, 2003). Figure 1 (left) presents the two-way interaction between Identity and INorms Low Severity, where low and high values of Identity were specified as one standard deviation below and above the mean, and the medium value was specified as the mean. INorms Low Severity was presented as a continuous variable. Similarly, Figure 1 (right) presents the interaction between Identity and INorms High Severity, where low and high values of Identity are represented by one standard deviation below and above the mean, and the medium value was specified as the mean. INorms High Severity is presented as a continuous variable. The likelihood of zero-scores was relatively low for all participants, in other words, reporting at least one alcohol-related consequence was relatively likely. Both interactions indicate stronger associations between perceived approval of drinking behaviors and zero-scores among participants who identified less closely with the typical same-sex student, but in opposite directions. Among students who identified as less close with the typical same-sex student, perceiving the typical same-sex student as more approving of the less severe drinking behaviors (e.g., having fun with friends, drinking shots, drinking to meet people) was negatively associated with zero-scores. Whereas for more severe injunctive drinking norms, those who identified as less close with the typical

same-sex student, perceiving the typical same-sex student as more approving of more severe drinking behaviors (e.g., drinking daily, driving a car after drinking, drinking alone) was positively associated with zero-scores.

Count results—Results from the counts portion of the model are predicted counts conditional on inclusion in the count portion of the model. Findings at Step 1 revealed a strong positive relationship between Drinking and the number of alcohol-related negative consequences experienced over the previous three months among expected drinkers. Perceiving the typical same-sex student as more approving of less severe drinking behaviors was positively associated with the number of reported alcohol-related negative consequences, whereas perceiving the typical same-sex student as more approving of more severe drinking behaviors was negatively associated with consequences.

Results at Step 2 indicated that Drinking interacted with both INorms Low Severity and INorms High Severity, but no two-way interactions were evident involving Identity. Regression lines between INorms Low Severity and INorms High Severity with alcohol-related negative consequences were plotted for low, medium, and high levels of drinking. The fifteenth percentile was chosen as the low value (0), the median was used as the medium value (3), and the eighty-fifth percentile was chosen to represent the high value (14) for typical drinking. INorms Low Severity and INorms High Severity are presented as continuous variables. Figure 2 (left) presents the interaction between Drinking and INorms Low Severity. Results indicated that the positive association between perceiving the typical same-sex student as more approving of less severe drinking behaviors and the number of alcohol-related negative consequences experienced increased at lower levels of typical drinking. Similarly, but in the opposite direction, the interaction between Drinking and INorms High Severity (Figure 2 right) revealed the negative association between perceiving the typical same-sex student as approving of more severe drinking behaviors and the number of alcohol-related negative consequences was stronger at lower levels of drinking.

Results from Step 3 indicated that the latter pattern of findings was somewhat more evident among participants who identify less closely with the typical same-sex student, as evident by the three-way interaction among Drinking, INorms High Severity, and Identity (Figure 3).

Discussion

Prior research examining the relationship between injunctive drinking norms and college student drinking has primarily focused on perceived injunctive norms for more severe drinking behaviors, such as drinking enough alcohol to pass out, drinking daily, and driving a car after drinking. The present study extends social norms literature by examining the relationships among alcohol consumption, negative consequences, and perceived injunctive drinking norms for the typical same-sex student for a range of drinking behaviors related to alcohol consumption and alcohol-related negative consequences, including behaviors that are less severe. Previous research has shown that the relationship between perceived injunctive drinking norms and alcohol consumption is dependent on the normative referent group, such that perceived injunctive drinking norms for more severe drinking behaviors are negatively associated with alcohol consumption when the normative referent is more distal (e.g., typical student) and positively associated with alcohol consumption when the normative referent is more proximal (i.e., close friends, family; Chawla, et al., 2007; Neighbors et al., 2008). The present study demonstrates that the relationships among perceived injunctive drinking norms for more distal normative referents, alcohol consumption, and negative consequences are also dependent upon the degree of severity of the drinking behaviors and level of identification with the normative referent.

Additionally, the present findings demonstrate that less severe injunctive drinking norms are positively associated with stronger identification with the typical same-sex student, heavier alcohol consumption, and experiencing more negative consequences. The association between perceived approval of more severe injunctive drinking norms and negative consequences was less straight forward as it was dependent on alcohol consumption and level of identification with the typical same-sex student. These findings may further explain why associations between injunctive norms and college drinking have been less consistent than associations between descriptive norms and college drinking (Neighbors et al., 2008). Results suggest that the association between negative consequences and injunctive drinking norms are more complex when considering the perceived approval of less severe and more severe drinking behaviors.

The present findings indicated that the relationship among drinking, approval of more severe drinking behaviors, and alcohol-related negative consequences was moderated by identity. In particular, among lighter drinkers and those who do not identify closely with the typical same-sex student, perceiving the typical same-sex student as approving of more extreme drinking behavior may be protective of experiencing alcohol-related negative consequences. However, it may also be the case that drinking behavior and identification drive perceptions of the typical same-sex student. Thus, future research needs to evaluate these relationships longitudinally.

While little variance in alcohol-related negative consequences among students who do not typically drink during an average week might be expected, it is important to note that these students may still consume heavy amounts of alcohol. For example, some typically light drinkers may consume heavy amounts of alcohol on a few occasions, thus putting them at risk for alcohol-related negative consequences. Greenbaum and colleagues (2005) suggested that lower tolerance in light drinkers may place students at increased risk for negative consequences on the occasions when they drink heavily. Their findings suggest that both light and heavy drinkers might be at risk for experiencing negative consequences associated with heavy-episodic drinking. However, recent research suggests that this may be especially true for lighter drinkers. Neal and colleagues (2007a, 2007b) found that average intoxication moderated the association between alcohol consumption and negative consequences such that lighter drinkers were at greater risk for negative consequences than heavier drinkers. In addition, Lewis and colleagues (2009) found that college students most likely to experience greater amounts of negative consequences associated with 21st birthday drinking were those who consumed heavy amounts of alcohol the week of their birthday, but who did not typically drink heavily. A similar relationship has been found with Spring Break drinking, such that lighter drinkers who drink heavily during Spring Break are at an increased risk for negative consequences (Lee, Lewis, & Neighbors, in press).

While deviance regulation theory, false consensus, and false uniqueness have underlying similarities, in the present study, deviance regulation theory offers a framework for when false consensus and false uniqueness may occur. The *positive* association between less severe injunctive drinking norms with drinking and alcohol-related negative consequences is consistent with deviance regulation theory. From this perspective, people try to maintain positive self-images by choosing desirable ways of deviating from social norms (i.e., uniqueness striving) and by avoiding undesirable ways of deviating from social norms (i.e., conformity striving). Less severe drinking behaviors are normative among college students and thus it may be considered undesirable to deviate. As such, the association between perceived approval of less severe drinking behaviors and one's own behavior (drinking and alcohol-related negative consequences) is consistent with the traditional assumptions that social norms are positively associated with behavior. *Not wanting to deviate* from normative behavior is likely to promote the false consensus effect, which posits that individuals tend to assume that their own drinking behaviors and attitudes are more similar to others' drinking

behavior and attitudes. Thus, in terms of less severe drinking behaviors, students tend to perceive that their peers behave and think similarly to themselves, consistent with the current finding that less severe injunctive drinking norms are positively associated with alcohol consumption and related negative consequences.

In contrast, more severe drinking behaviors are viewed as socially less desirable and distancing oneself from others on these behaviors provides an opportunity for positive distinction. Thus, the *negative* association between more severe injunctive drinking norms with drinking and alcohol-related negative consequences is also consistent with deviance regulation theory. *Deviation* from socially undesirable behavior is functionally equivalent to the false uniqueness effect where individuals distance themselves from the potential for negative distinction. For lighter or typical non-drinkers, students may perceive that other students are approving of more severe drinking behaviors, thus making them unique from their peers in a positive light.

Implications for Social Norms Interventions

Prior research has demonstrated a consistent relationship between descriptive drinking norms and drinking behavior with overestimated descriptive drinking norms for distal and proximal normative referents being positively associated with heavier drinking and experiencing negative consequences (Borsari & Carey, 2001; 2003; Larimer et al., 2004; Lewis & Neighbors, 2004; Neighbors, et al., 2006). This consistent relationship across various normative referents may be one reason why the majority of social norms interventions utilize descriptive drinking norms more so than normative information related to injunctive drinking norms (Larimer & Cronce, 2007; Lewis & Neighbors, 2006, 2007; Lewis, Neighbors, Oster-Aaland, Kirkeby, & Larimer, 2007; Neighbors, Larimer, & Lewis, 2004; Neighbors, Lewis, Bergstrom, & Larimer, 2006; Walters & Neighbors, 2005).

In addition, the majority of research on descriptive drinking behavior has focused on normative perceptions for the frequency and quantity of alcohol use (Borsari & Carey, 2001; 2003; Lewis & Neighbors, 2004; Neighbors et al., 2006), whereas previous research on injunctive drinking norms has focused on perceptions regarding the severity of alcohol use (i.e., drinking enough alcohol to pass out, drinking alcohol daily) and alcohol-related negative consequences (i.e., driving a car after drinking; Baer, 1994; Carey et al., 2006; Chawla et al., 2007; Larimer et al., 2004). Because injunctive norms research focuses on approval and severity of alcohol use and related negative consequences, it is more subjective in comparison to descriptive normative information. For example, descriptive normative information generally provides information such as the following: The typical student drinks 1.3 times a week, and has about 3.3 drinks per occasion. Injunctive normative information might include information such as the following: On a scale of one (unacceptable) to seven (acceptable), the typical student rates driving a car after drinking a 1.4 or unacceptable. The subjective nature of injunctive normative information may be another reason as to why social norms interventions use descriptive normative information rather than injunctive normative information.

Moreover, many brief alcohol prevention interventions follow a style consistent with motivational interviewing (Carey, Scott-Sheldon, Carey, DeMartini, 2007 ; Larimer & Cronce, 2007). Motivational interviewing is a non-judgmental, non-confrontational clinical approach that can be used to elicit personally relevant reasons to change and to explore and resolve ambivalence (Miller & Rollnick, 2002). One of the basic principles of motivational interviewing is the development of discrepancies, which typically involves considering an individual's values or goals for the future (e.g., "getting into graduate school is important to me") as a contrast to the status quo ("I haven't been to our last three morning classes and am behind because of partying"). Many brief interventions with college students include the delivery of personalized feedback, including descriptive normative information, consequences experienced by the individual, and other measures of the impact of one's alcohol use (Larimer

& Cronce, 2007). As personalized feedback is reviewed, information previously provided by the individual can be used to generate discrepancies. In doing so, it is often the case that a domain within the feedback emerges as a "hook" of particular interest, relevance, or importance to the individual. The value associated with how an individual sees him- or herself (or is seen by his or her peers) could be such a hook.

Descriptive normative information is commonly included in graphic feedback, and can be a realm in which discrepancies emerge. For example, a student for whom it is important to avoid drinking more than "everyone else" could think the typical student consumes eight drinks per occasion, finds that the typical student actually drinks two drinks per occasion, and contemplates changing his or her own behavior to be more in line with the person's value or self-image. Additional research is needed to examine the impact of incorporating injunctive normative information in motivation enhancement interventions and to explore for whom this information could be most effective. For example, presenting actual norms regarding the "approval" or "acceptance" of drinking behaviors to students who engage in these behaviors might be considered inconsistent with a motivational interviewing approach if seen as confrontational or judgmental by the individual. However, for individuals for whom goals and values surrounding attitudes and approval are important and relevant, it is possible that accurate, personalized information about injunctive norms could serve to prompt contemplation of change. Regardless of the reasons why, interventions more often include descriptive normative information in comparison to injunctive normative information. Based on the inconsistent findings surrounding injunctive normative information (Chawla et al., 2007; Kuther & Higgins-D'Alessandro, 2003; Neighbors et al., 2007; Neighbors et al., 2008), additional research is needed prior to implementation in preventative interventions.

The present findings have several implications for social norms interventions, as they indicate that proximity of normative referent is not only important when examining the relationship between perceived injunctive norms and drinking behavior (Chawla et al., 2007; Neighbors et al., 2008) but that level of alcohol consumption and identity are also important factors to consider. The present findings indicate that among lighter drinkers and those who do not identify closely with the typical same-sex student, perceiving the typical same-sex student as approving of more severe drinking behavior may be protective of experiencing alcohol-related negative consequences; thus, it may not be beneficial to try to alter their injunctive normative perceptions. Furthermore, for heavier drinking students, there was no association between the likelihood of experiencing negative consequences and perceptions of the typical same-sex student's approval of more severe drinking behaviors, suggesting that among students who drink, the likelihood of experiencing negative consequences is independent of their perceived approval of more severe drinking behavior. This finding suggests that preventative interventions that include a presentation of injunctive normative information related to more severe drinking behaviors may not impact alcohol-related problems among heavy drinking college students. In summary, the present findings suggest that social norms interventions should consider providing normative information for less severe injunctive drinking norms when using a universal prevention approach, or should consider only providing less severe injunctive norms information to heavier drinking students.

Limitations/Future Directions

The cross-sectional nature of the present study limits our ability to make casual inferences. Thus, future research should examine the relationships among less and more severe injunctive drinking norms and drinking behavior over time to clarify causal sequence. Additionally, it should be noted that two injunctive drinking norms items may overlap with two of the negative consequences items (e.g., "driving a car after drinking" and "did you drive a car when you knew you had too much to drink?" as well as "playing drinking games" and "did you participate

in drinking contests or drinking games?"). Finally, this research did not examine perceived injunctive drinking norms for normative referents of varying proximity. Future research should examine the role of alcohol consumption and identity when examining severity of injunctive drinking norms with more proximal normative referents, such as close friends.

Conclusions

The present study extends previous research on social norms literature by demonstrating that the relationship between perceived injunctive drinking norms and alcohol-related problems is dependent upon the severity of the normative drinking behaviors, alcohol consumption, and identification with the normative referent. Overall, results suggest that the association between negative consequences and injunctive drinking norms are more complex when considering the perceived approval of less severe and more severe drinking behaviors. Future research is needed to further evaluate these relationships among normative referents of varying proximity.

Acknowledgments

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Figure 1.
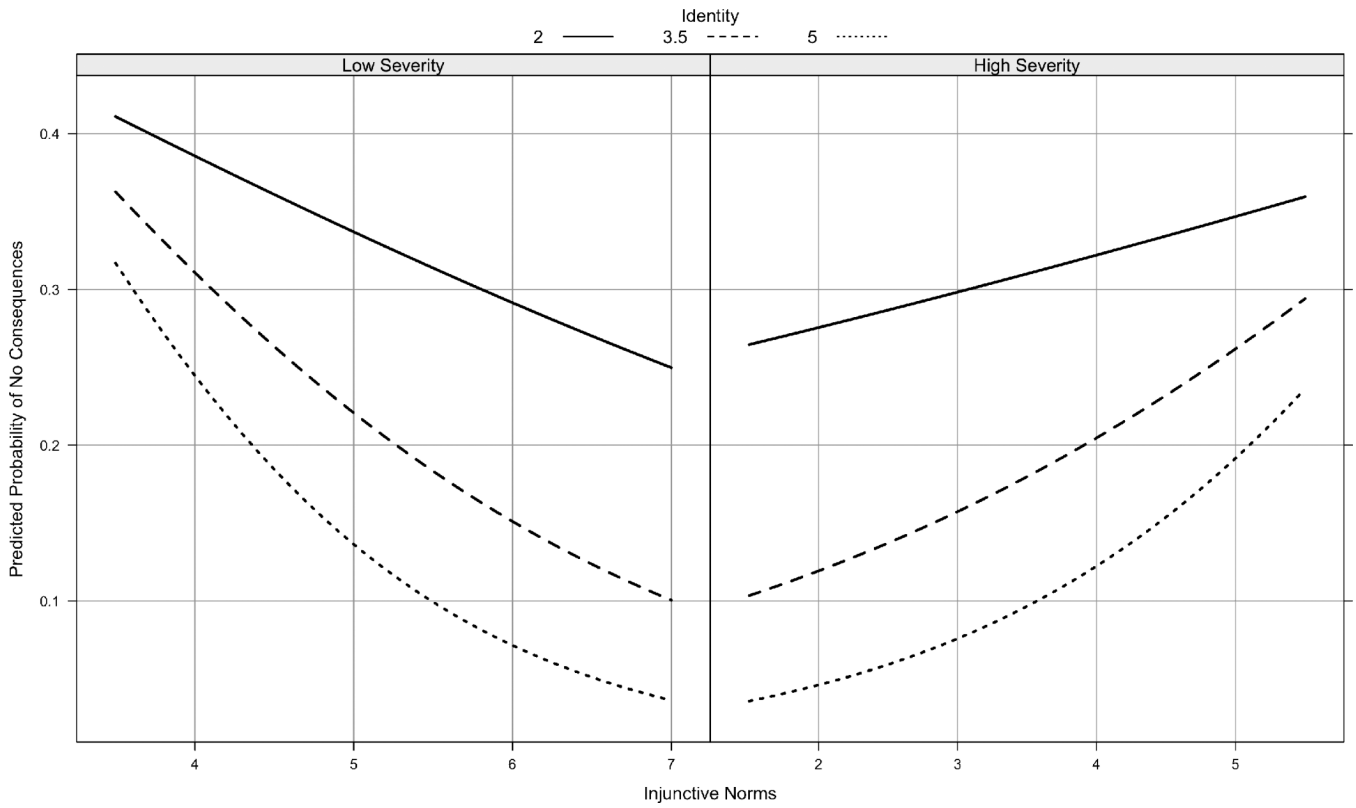Two-way interactions between levels of identity with typical same-sex student and injunctive norms for low (left) and high (right) severity items.
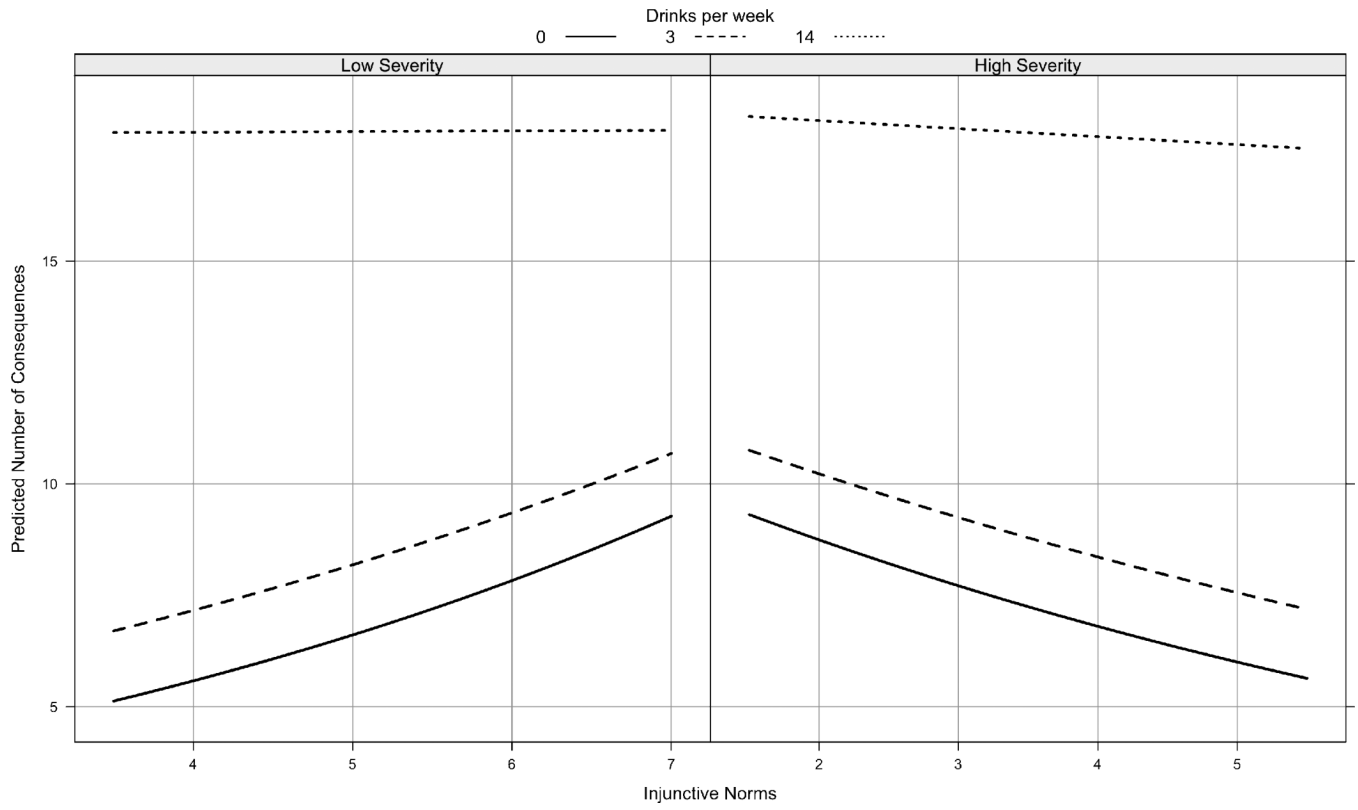
Figure 2.
Two-way interactions between drinks per week and injunctive norms for low (left) and high (right) severity items.
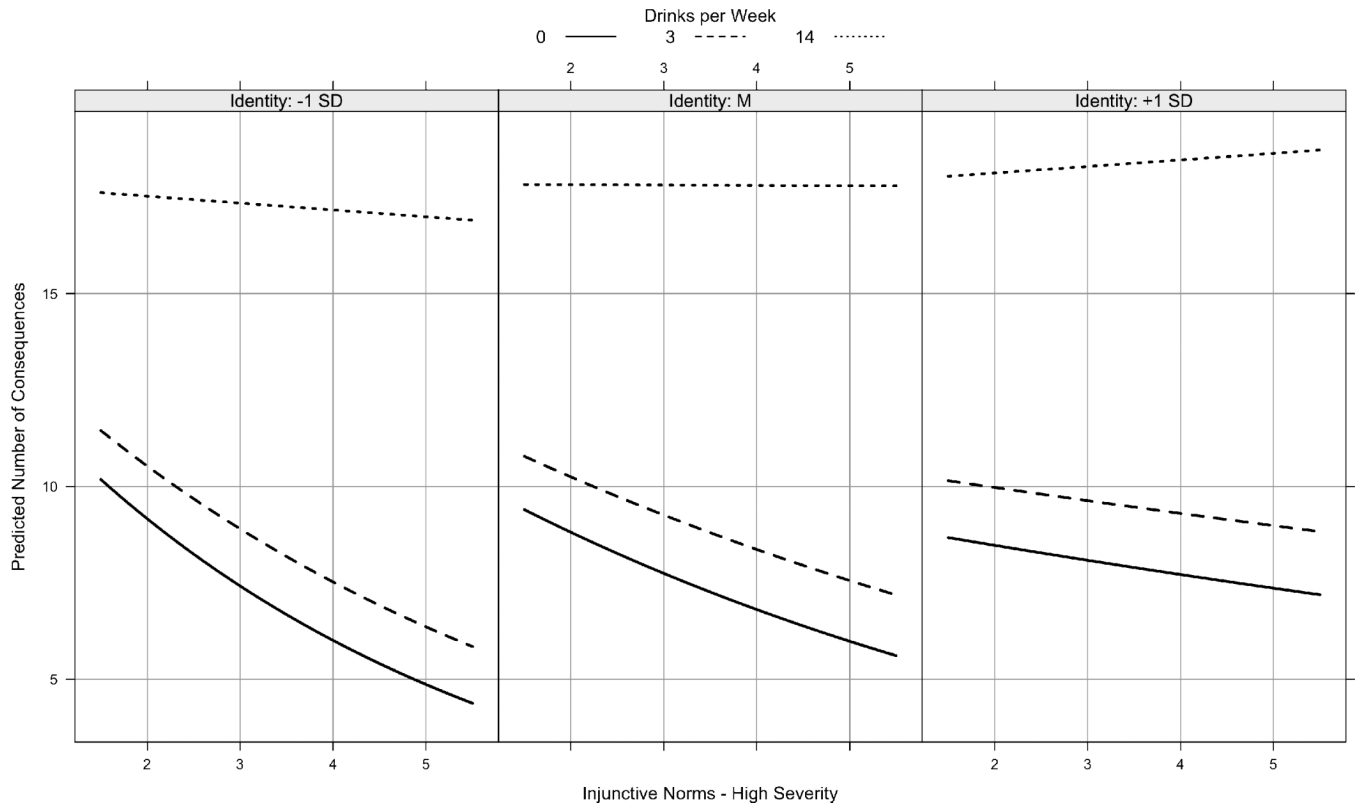
Figure 3.
Three-way interaction between drinks per week, injunctive norms for high severity items, and identity with typical same-sex students.

Table 1

Item Factor Loadings, Means, and Standard Deviations for Less and More Severe Injunctive Drinking Behaviors

Item	Factor 1 Loading	Factor 2 Loading	M	SD
Playing drinking games	**.86**	−.18	5.64	1.46
Drinking to have fun	**.86**	−.29	5.94	1.32
Drinking shots	**.84**	−.19	5.62	1.37
Drinking to meet people	**.83**	−.16	5.76	1.37
Drinking to get drunk	**.81**	.07	5.00	1.71
Drinking with friends	**.77**	−.39	6.22	1.20
Drinking alcohol every weekend	**.76**	−.09	5.50	1.58
Drinking under the age of 21	**.75**	−.12	5.38	1.61
Drinking alcohol	**.67**	−.37	6.08	1.26
Drinking to blow off steam	**.64**	.35	4.20	1.75
Driving a car after drinking	.34	**.71**	2.36	1.77
Drinking alcohol daily	.49	**.60**	3.25	1.74
Drinking alone	.29	**.59**	3.27	1.77
Drinking enough alcohol to pass out	.57	**.58**	3.43	1.76
Never drinking (reverse scored)	.16	**.50**	3.36	2.00

Note. Participants were asked "how acceptable (or unacceptable) do you think the typical male/female student finds each of the following behaviors?"
All items were coded on a 7-point scale ranging from 1 *(unacceptable)* to 7 *(acceptable)*. Items were coded to represent the typical same-sex student.

Table 2

Means, Standard Deviations, and Zero-order Correlations

Variable	M	SD	1	2	3	4	5	6
1. Negative Consequences	11.71	12.91	-					
2. Drinks per Week	6.37	8.72	.76***	-				
3. Identity	3.53	1.52	.21***	.17***	-			
4. DNorms	12.73	8.61	.34***	.43***	.01	-		
5. INorms Low Severity	5.68	1.76	.15***	.14***	.15***	.21***	-	
6. INorms High Severity	3.31	1.23	−.08**	−.09**	−.15***	.19***	.40***	-

Note. Ns ranged from 951 to 994 due to missing data.

Identity = level of identification with the same-sex typical student. DNorms = perceived descriptive drinking norms. INorms Low Severity = perceived injunctive drinking norms for less severe drinking behaviors. INorms High Severity = perceived injunctive drinking norms for more severe drinking behaviors.

**
 p < .01.

***
 p < .001.

Table 3

ZINB Regression Results Examining Drinks per Week

Predictor	B	SE B	Z	Ratio (95% CI)
Logistic Portion of the Model				
Step 1				
Gender	0.060	0.193	0.31	1.062 (0.727, 1.550)
Identity	−0.327	0.069	−4.72***	0.721 (0.629, 0.826)
DNorms	−0.068	0.014	−4.87***	0.934 (0.909, 0.960)
INorms Low Severity	−0.311	0.085	−3.66***	0.733 (0.620, 0.866)
INorms High Severity	0.195	0.087	2.23*	1.215 (1.024, 1.443)
Step 2				
Identity × INorms Low Severity	−0.035	0.058	−0.60	0.966 (0.863, 1.081)
Identity × INorms High Severity	−0.012	0.057	−0.21	0.988 (0.884, 1.105)
Counts Portion of the Model				
Step 1				
Gender	0.364	0.076	4.77***	1.438 (1.238, 1.669)
Identity	0.073	0.026	2.83**	1.076 (1.022, 1.132)
DNorms	0.046	0.004	10.31***	1.047 (1.038, 1.056)
INorms Low Severity	0.073	0.038	1.92†	1.075 (0.998, 1.159)
INorms High Severity	−0.184	0.033	−5.54***	0.832 (0.780, 0.888)
Step 2				
Identity × INorms Low Severity	−0.040	0.026	−1.53	0.960 (0.912, 1.011)
Identity × INorms High Severity	0.002	0.020	0.11	1.002 (0.963, 1.042)

Note. $n = 946$.

Ratio = zero-inflated odds ratios are presented for the logistic portion of the model and negative binomial incidence rate ratios are presented for the counts portion of the model. Identity = level of identification with the same-sex typical student. DNorms = perceived descriptive drinking norms. INorms Low Severity = perceived injunctive drinking norms for less severe drinking behaviors. INorms High Severity = perceived injunctive drinking norms for more severe drinking behaviors.

† $p = .054$.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

Table 4

ZINB Regression Results Examining Alcohol-Related Negative Consequences

Predictor	*B*	*SE B*	*Z*	*Ratio (95% CI)*
Logistic Portion of Model				
Step 1				
Gender	0.058	0.195	0.30	1.060 (0.723, 1.553)
Identity	−0.430	0.072	−5.96***	0.650 (0.565, 0.749)
DNorms	−0.084	0.016	−5.30***	0.919 (0.891, 0.948)
INorms Low Severity	−0.330	0.086	−3.82**	0.719 (0.607, 0.851)
INorms High Severity	0.256	0.117	2.90**	1.291 (1.087, 1.535)
Step 2				
Identity × INorms Low Severity	−0.160	0.062	−2.57**	0.852 (0.755, 0.963)
Identity × INorm High Severity	0.133	0.061	2.18*	1.143 (1.013, 1.289)
Counts Portion of Model				
Step 1				
Gender	−0.060	0.058	−1.10	0.942 (0.846, 1.048)
Drinking	0.061	0.004	17.02***	1.063 (1.056, 1.071)
Identity	0.030	0.018	1.68	1.031 (0.995, 1.067)
DNorms	0.004	0.003	1.09	1.004 (0.997, 1.010)
INorms Low Severity	0.067	0.026	2.63**	1.070 (1.017, 1.124)
INorms High Severity	−0.049	0.024	−2.01*	0.952 (0.908, 0.999)
Step 2				
Drinking × INorms Low Severity	−0.013	0.003	−3.79***	0.988 (0.981, 0.944)
Drinking × INorms High Severity	0.009	0.003	3.26**	1.009 (1.004, 1.015)
Identity × Drinking	−0.002	0.002	−0.70	0.998 (0.994, 1.003)
Identity × INorms Low Severity	−0.011	0.015	−0.71	0.989 (0.960, 1.020)
Identity × INorms High Severity	0.026	0.014	1.80	1.026 (0.998, 1.056)
Step 3				
Identity × Drinking × INorms Low	0.002	0.002	1.09	1.002 (0.998, 1.006)
Identity × Drinking × INorms High	−0.004	0.002	−2.17*	0.996 (0.993, 0.999)

Note. $n = 946$.

Ratio = zero-inflated odds ratios are presented for the logistic portion of the model and negative binomial incidence rate ratios are presented for the counts portion of the model. Identity = level of identification with the same-sex typical student. DNorms = perceived descriptive drinking norms. INorms Low Severity = perceived injunctive drinking norms for less severe drinking behaviors. INorms High Severity = perceived injunctive drinking norms for more severe drinking behaviors.

*
$p < .05$.

**
$p < .01$.

***
$p < .001$.