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Injunctive Norms and Alcohol Consumption: A Revised Conceptualization

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Abstract

Background—Injunctive norms have been found to be important predictors of behaviors in many disciplines with the exception of alcohol research. This exception is likely due to a misconceptualization of injunctive norms for alcohol consumption. To address this, we outline and test a new conceptualization of injunctive norms and personal approval for alcohol consumption. Traditionally, injunctive norms have been assessed using Likert scale ratings of approval perceptions, whereas descriptive norms and individual behaviors are typically measured with behavioral estimates (i.e., number of drinks consumed per week, frequency of drinking, etc.). This makes comparisons between these constructs difficult because they are not similar conceptualizations of drinking behaviors. The present research evaluated a new representation of injunctive norms with anchors comparable to descriptive norms measures.

Methods—A study and a replication were conducted including 2,559 and 1,189 undergraduate students from three different universities. Participants reported on their alcohol-related consumption behaviors, personal approval of drinking, and descriptive and injunctive norms. Personal approval and injunctive norms were measured using both traditional measures and a new drink-based measure.

Results—Results from both studies indicated that drink-based injunctive norms were uniquely and positively associated with drinking whereas traditionally assessed injunctive norms were negatively associated with drinking. Analyses also revealed significant unique associations between drink-based injunctive norms and personal approval when controlling for descriptive norms.

Conclusions—These findings provide support for a modified conceptualization of personal approval and injunctive norms related to alcohol consumption and, importantly, offers an

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explanation and practical solution for the small and inconsistent findings related to injunctive norms and drinking in past studies.

Keywords

injunctive norms; descriptive norms; alcohol consumption

Introduction

Social norms, or implicit and explicit expectations regarding behavior (Sherif, 1936), are powerful predictors of behavior. Descriptive norms are operationalized as an individual's perceptions of their peers' behaviors, while injunctive norms are an individual's perceptions of how acceptable their peers find a behavior (Cialdini et al. 1990). Descriptive norms have been consistently associated with drinking and successfully incorporated in interventions (e.g. Lewis & Neighbors 2006; Neighbors et al. 2004). For example, in a recent review, 42 of 43 drinking interventions for college students included descriptive norms and none included injunctive norms (Miller et al. 2013). This discrepancy may result from mixed research findings regarding the associations between injunctive norms and drinking (e.g., LaBrie et al. 2009; Neighbors et al. 2008; Rimal & Real 2005). However, some support has been found for injunctive norms as efficacious in interventions (Prince et al. 2015), suggesting they may have untapped potential.

The present research proposes injunctive norms may be an important determinant of alcohol use and suggests mixed findings may be due to conceptual oversights and lack of congruence among attitudes, injunctive norms, and behavior. To this end, we evaluate whether correcting attitude-behavior inconsistencies and establishing correspondence among attitudes, injunctive norms, and behaviors might rectify the absence of consistent evidence for injunctive norms as a predictor of drinking. Demonstrating injunctive norms as theoretically unique and consistent predictors of drinking outcomes, after addressing potential measurement issues, would support their incorporation in brief interventions. If injunctive norms consistently accounted for unique variance in drinking, then using both norms in feedback interventions could substantially improve effect sizes. Practically speaking, incorporation of injunctive norms into existing feedback interventions would be justified if perceived injunctive norms can be shown to be 1) discrepant from actual injunctive norms; 2) uniquely associated with behavior, over and above descriptive norms; and 3) assessed in a way that allows for concrete interpretable feedback. This paper aims to provide an alternative way to assess injunctive norms that may achieve these aims.

Overestimations of descriptive norms have been consistently, positively associated with personal drinking behaviors, personal approval of drinking, and consequences of drinking (e.g., Borsari & Carey 2001; 2003; Larimer et al. 2004; Neighbors et al. 2008). The discrepancy and consistency between injunctive norms, actual peer approval, and personal behaviors, however, has had different relationships with drinking patterns (Collins & Spelman 2013; Neighbors et al. 2008). For example, injunctive norms have been found to predict drinking behavior and consequences longitudinally (Larimer et al. 2004). When accounting for descriptive norms, the associations between injunctive norms and drinking

change (Neighbors et al. 2008; LaBrie et al. 2009). Specifically, injunctive norms are positively associated with drinking individually, but are negatively associated when descriptive norms are added (Collins & Spelman 2013; Neighbors et al. 2008). The associations between traditional measures of injunctive norms and individual behaviors may be due in part to differences in perceptions of attitudes and behaviors as well as how those attitudes and descriptive norms are measured (Borsari & Carey 2001).

Research on approval and injunctive norms in other disciplines has found that approval is an important positive predictor of behavior. Measures of injunctive norms in these realms are consistent with measures of descriptive norms and behaviors. For instance, in the Neighbors et al. (2008) marijuana study, descriptive norms, injunctive norms, and behaviors all referenced frequency of marijuana use. In White et al. (2009), measures of all norms types and recycling intentions were similarly anchored scales such that descriptive and injunctive norms, attitudes, and behaviors could be easily compared. When assessing injunctive norms and intentions to get health screenings, Smith-McLallen and Fishbein (2008) used scales anchored at should and should not for injunctive norms and unlikely to likely for intentions.

Injunctive norms and approval of drinking have often been assessed from an abstract perspective, focusing on broad behaviors (e.g., approval of 'drinking') or behaviors that occur following drinking (e.g., approval of driving after drinking; Baer 1994). It is important to consider the specific approval participants are asked to report. Particularly, is it approval of participating in a general behavior (e.g., consuming alcohol), participating in a specific behavior, (e.g., drinking shots), experiencing an event/being in a context associated with a behavior, (e.g., drinking at a party) or experiencing consequences of a behavior (e.g., having a hangover)? Some measures also include questions assessing approval of consequences of drinking, not just approval of consumption (e.g., approval of drinking enough to pass out).

Traditional measures of descriptive norms, on the other hand, were modeled after common measures of drinking outcomes. For example, participants estimate the number of drinks consumed by peers each day of the week, on a typical occasion, and how frequently (Baer et al. 1991). Participants report how many drinks they consume on average each day of the week, on a typical drinking occasion, and how frequently. Traditional injunctive norms and personal approval measures do not map onto measures of descriptive norms or individual behaviors, which may partially explain the inconsistent associations found in the literature. Including ratings of alcohol consequences may also produce confounded approval ratings of both drinking and consequences, which go beyond the scope of descriptive norms and drinking behaviors and makes drawing conclusions about relationships among these constructs difficult.

Combining these traditional measures in analyses have been problematic. The significant findings that have emerged using these measures are not surprising as positive perceptions of drinking consequences have been found to be positively related to drinking behaviors (Patrick & Maggs 2011). However, we believe that stronger and more consistent associations will emerge among attitudes, injunctive norms, and drinking outcomes when all are assessed with a high degree of correspondence. Stronger relationships are expected between drinking behaviors, descriptive norms, and a drink-based assessment of injunctive norms due to direct

correspondence among approval of weekly drinking, drinking frequency, and typical drinking per occasion to actual reported behaviors and perceptions of others' behavior. Furthermore, we expect correspondent injunctive norms to reduce inconsistencies in measurements of approval and to reduce confounding with approval of drinking consequences rather than consumption. To test this, two studies were conducted assessing relationships between a measure of injunctive norms with high correspondence to behavior and traditional measures of injunctive norms, descriptive norms, personal approval, and personal drinking behaviors. The initial study was conducted at two universities with moderate drinkers. The replication study was conducted at a large, diverse public university of light drinking students.

The Present Research

The hypotheses for both studies were that 1) the newly conceptualized injunctive norms measure (assessed with high concordance to drinking behaviors; termed drink-based injunctive norms) would be positively associated with drinking behaviors beyond the effects of traditional measures of injunctive norms and descriptive norms; 2) drink-based personal approval would be positively associated with drinking behaviors beyond the effects of traditional measures of personal approval and descriptive norms. In sum, we expected the drink-based measure of injunctive norms to outperform a traditional measure of injunctive norms in predicting weekly drinking.

Study 1 Method

Participants and Procedure

Participants included 2,559 undergraduate students from one large public university and one medium private university, on the west coast. Data used in this study came from the screening data obtained from a larger intervention study on alcohol behaviors. Undergraduate students at each university were recruited via email and asked to complete a 20-minute screening survey online. Participants were compensated with \$15 for completion of the screening survey. A total of 5,998 students were contacted and 2,688 (44.8%) completed the screening survey and met inclusion criteria of heavy drinking defined as consuming 4/5 drinks on an occasion for women/men in the past month. A final sample of 2,559 was obtained after removing 129 responses due to failure to complete significant survey portions. Demographics of the combined sample for Study 1 included mean age 19.94 (SD = 1.40), 62.8% female, 60.4% Caucasian, 19.5% Asian, 10.7% Multiracial, 4.7% "Other," 2.8% African American, 1.5% Hawaiian/Pacific Islander, 0.2% Indian/Alaskan Native, and 12.9% identified their ethnicity as Hispanic. Approval was received from both university Institutional Review Boards prior to conducting the research.

Measures

Alcohol use—The Daily Drinking Questionnaire (DDQ; Collins et al. 1985) was used to measure alcohol consumption. Participants were asked to report the average number of standard drinks consumed as well as the time period of consumption for each day of the week over the previous month (e.g., "How much alcohol, on average (measured in number of drinks), do you drink on each day of a typical week?"). Final scores represent the average

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number of drinks consumed each week over the previous month. Weekly drinking has previously been shown to be a reliable index of alcohol-related problems among college students relative to other drinking indices (Borsari et al. 2001). Drinking frequency was measured with one question asking participants to select how often they consumed alcohol from a list of 12 responses ranging from 'Never' to 'Every day.' Scores for drinking frequency were converted to a 0 to 7 scale representing the number of days in a week participant reported drinking. Average number of drinks per occasion was measured using one item assessing the number of drinks, on average, typically consumed. Response options ranged from 0 to 25 or more.

Descriptive norms—The Drinking Norms Rating Form (DNRF; Baer et al. 1991) was used to assess perceived descriptive norms and mirrors the DDQ. Participants were asked to estimate the drinking practices of typical college students, such as the quantity of alcohol consumed on each day of the week. Participants were also asked to estimate the number of drinks consumed by the typical student on a given occasion (e.g., "How many drinks on average do you think a typical student at your college consumes on a given occasion?"). Perceived weekly drinking (descriptive norms) was computed by summing the reported estimates of drinking for each day of the week for the typical student. This measure has previously demonstrated good convergent validity with measures of drinking (Baer et al. 1991; Borsari & Carey 2000; Neighbors et al. 2004).

Traditional Measure of Personal Approval and Injunctive Norms—Participants were asked to rate on a 7-point Likert scale how much they, their closest friend, their parents, and their typical [university name] peers approve of four different drinking situations. Drinking situations included drinking daily, drinking every weekend, drinking and driving, and passing out from drinking. Only questions pertaining to participants' approval and their perceptions of typical student approval were used in this study. These two scales consisted of four items and response options range from 'Strongly Disapprove' to 'Strongly Approve.' Approval was averaged across the four drinking situations to create a score for the individual's own attitudes (traditional personal approval; $\alpha = .70$), and the perceived attitudes of their peers (traditional injunctive norms; $\alpha = .75$). This format is consistent with the most widely used measures of injunctive norms for drinking (e.g., Baer 1994; Keefe 1994; Lewis et al. 2010; Neighbors et al. 2008).

Drink-Based Measure of Personal Approval and Injunctive Norms—A measure of personal approval and injunctive norms was adapted from the DNRF (Baer et al. 1991). It was designed to have high correspondence with the assessment of drinking behavior (i.e., the DDQ; Collins et al. 1985) and descriptive norms (i.e., the DNRF; Baer et al. 1991). Participants were asked to enter the maximum number of drinks they would consider acceptable to consume on each day of the week (drink-based personal approval) and the maximum number of drinks a typical university student would consider acceptable (drink-based injunctive norms). Additionally, participants indicated the highest frequency of drinking and the maximum number of drinks during one occasion they found to be acceptable and typical university students would find acceptable. Scores for personal

approval and injunctive norms represent the maximum number of drinks thought to be acceptable to consume during a week.

Study 1 Results

Descriptive statistics and Pearson product-moment correlations for the variables of interest in this study are displayed in Table 1. Due to the large sample size, statistical significance was not used to identify meaningful associations; instead, results focus on the effect size of the independent variables on drinking outcome variables. Correlations and effect sizes are discussed and correlations of .10, .30, and .50 and Cohen's d values of .20, .50, and .80 are considered small, medium, and large, respectively (Cohen 1992). Drink-based personal approval was moderately to strongly positively correlated with traditional measures of personal approval but not correlated with traditional injunctive norms. Drink-based injunctive norms were weakly to moderately positively associated with traditional measures of personal approval and injunctive norms. Traditional measures of injunctive norms were not correlated with weekly drinking, drinking frequency, or typical drinks per occasion, while drink-based injunctive norms were weakly to moderately positively positively positively associated with most drinking behaviors.

Primary Analysis

All drinking outcomes were positively skewed and most closely approximated by negative binominal distributions. Negative binomial regressions with log links (Hilbe 2011) were therefore used in all primary analyses. Primary analyses focused on examining whether drink-based injunctive norms and personal approval would account for unique variance in drinking over and above traditional measures of injunctive norms and personal approval and descriptive norms. Two sets of hierarchical negative binomial regression analyses were conducted. The first analysis focused on injunctive norms and the second on personal approval. In the first analysis, the traditional measure of injunctive norms was entered to predict weekly drinking at Step 1. At Step 2, descriptive norms were added. Finally at Step 3, drink-based injunctive norms were added. Gender and study site were included in all steps as control variables but do not appear in tables for parsimony. Negative binomial regression analyses were also conducted replacing the dependent variable with drinking frequency and typical number of drinks consumed on a drinking occasion. Results are provided in Table 2. Parameter estimates are linked with predicted outcomes by a log function and exponentiated parameter estimates represent expected changes in rate ratios per unit change in predictor (Hilbe 2011). Thus, at Step 1, each unit change in traditional injunctive norms was associated with a 1% change in drinks per week ($e^b = 1.01$), a 2% increase in drinking frequency $(e^b = 1.02)$, and a 2% increase in typical quantity $(e^b = 1.02)$. None of these associations were deemed meaningful or beyond what would be expected by chance. At Step 2, traditional norms became negatively associated with drinking outcomes. Unit increases in descriptive norms were associated with 6%, 19%, and 22% increases in drinks per week, frequency, and typical quantity, respectively. At Step 3, unique unit increases in drink-based injunctive norms were associated with additional increases of 1%, 9%, and 8% in drinks per week, frequency, and typical quantity, respectively. In Steps 2 and 3 traditional injunctive

norms were significantly associated with drinking outcomes in the opposite direction of theoretical expectation.

In the second series of hierarchical negative binomial regression analyses, the traditional measure of personal approval was entered to predict weekly drinking at Step 1. At Step 2, descriptive norms were added. Drink-based personal approval was added at Step 3. This analysis was also performed using drinking frequency and typical drinks per occasion as outcome variables. As the results in Table 2 indicate, the traditional measure of personal approval was strongly associated with weekly drinking, drinking frequency, and typical drinks per occasion in all steps. Descriptive norms accounted for significant unique variances beyond the traditional measure of personal approval. For all three drinking outcomes, the drink-based measure of personal approval accounted for unique variance over and above both the traditional measure of personal approval and descriptive norms.

Study 1 Discussion

Study 1 provided strong support for the importance of attending to correspondence in assessing associations between injunctive norms and drinking. The traditional measure of injunctive norms was not independently associated with drinking outcomes. When other predictors were included, they predicted drinking in the opposite direction of theoretical expectation (i.e., greater perceived peer approval of drinking was associated with less drinking). These findings replicate previous problems with traditional measures of injunctive norms as predictors of drinking. In contrast, when injunctive norms were assessed with high correspondence to behavioral outcomes, they predicted unique variance in drinking outcomes over and above traditional injunctive norms and descriptive norms in the theoretically expected direction. This pattern of results supports the notion that when descriptive and injunctive norms are measured in correspondence to behavioral outcomes, they are uniquely important predictors of drinking. Traditional measures of personal approval were strong predictors of drinking outcomes, but the drinks-based measure of personal approval fared at least equally well as a predictor.

While Study 1 provides support for a drink-based injunctive norms and personal approval measure, there is need for replication in order to maintain confidence in research findings (e.g., McNutt 2014; Simons 2014). Study 2 is a replication of Study 1 in a different university sample to test generalizability of the study results. Furthermore, Study 2 broadened the scope of the injunctive norms and personal approval questions from "...the maximum number of drinks..." to simply "... the number of drinks..." to assess if specific wording influences the results.

Study 2 Method

Participants

Participants included 1,189 undergraduate students from a large southwestern university. Students were recruited via email and all procedures occurred via the Internet. Ten thousand registered students' contact information was obtained from the university registrar's office. Students were emailed invitations to participate in an online screening survey examining

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relationships among social norms, social identity, and drinking among college students. Of those invited, 1,189 students completed screening and met criteria for the baseline survey (12%). Inclusion criteria were consuming 4/5 drinks (for women/men) on an occasion at least once in the past month. Participants received a \$25 gift card for participation. The university's Institutional Review Board approved all the procedures of the study. Demographics of the sample for Study 2 included mean age 20.62 (SD = 1.85), 61.2% women, 36.8% Caucasian, 34.6% Asian, 11.1% Black/African American, 7.1% Multiracial, 8.9% "Other," 0.9% Hawaiian/Pacific Islander, 0.6% Indian/Alaskan Native, and 25.9% identified as Hispanic/Latino(a).

Measures

Alcohol Use, Descriptive Norms, and Injunctive Norms—With the exception of the measure of drink-based injunctive norms and the traditional measure of injunctive norms, the measures used to assess alcohol use and descriptive norms were the same as in Study 1. The Daily Drinking Questionnaire (DDQ; Collins et al. 1985) was used to measure alcohol consumption and the Drinking Norms Rating Form (DNRF; Baer et al. 1991) was used to assess perceived descriptive norms. Likert scales were used to assess traditional injunctive norms and personal approval, and new drink-based measures were used to assess drinkbased personal approval and injunctive norms. In Study 2, however, the wording for the injunctive norms measure was modified from asking participants to enter the maximum number of drinks they would consider to be acceptable to the number of drinks considered to be acceptable. The traditional Likert measures of injunctive norms ($\alpha = .92$) and personal approval ($\alpha = .92$) were measured using 15 questions instead of 4 and assessed an expanded range of drinking behaviors and motives (Lewis et al., 2010). Expanded questions included 'Drinking to get drunk,' 'Playing drinking games,' and 'Drinking with friends.' Analyses using only the four items from Study 1 did not substantively change the results reported below.

Study 2 Results

Similar relationships were found between drink-based injunctive norms and personal approval and traditional measures and drinking behaviors to those in Study 1. With three exceptions, significant positive associations were found among drink-based injunctive norms, drink-based measures of personal approval, and traditional measures of both constructs (*r*'s ranged from .13 to .66). Drink-based injunctive norms for drinks per week were not associated with traditional personal approval. Additionally, neither drink based personal approval for drinks per week nor drinks per occasion were associated with traditional injunctive norms.

The traditional measure of injunctive norms was not associated with any drinking behavior. On the other hand, drink-based measures of injunctive norms and personal approval were significantly positively associated with all three drinking behaviors except in four instances. Those exceptions were that drink-based injunctive norms for drinking frequency were not associated with drinks per week or typical occasion. Further, drink-based injunctive norms

for drinks per week were not associated with drinking frequency or typical occasion. Descriptive statistics and Pearson product-moment correlations are displayed in Table 3.

Primary Analyses

As in Study 1, hierarchical negative binomial regression analyses were performed to assess the primary questions of interest. Traditional injunctive norms were entered predicting weekly drinking, in Step 1. Descriptive norms were added in Step 2 and drink-based injunctive norms were added in Step 3. Negative binomial regression analyses were also run to predict drinking frequency and typical drinks per occasion and the results are displayed in Table 4. Descriptive norms had the largest effect on weekly drinking when all three variables were included in the analysis. Conversely, drink-based injunctive norms had the largest effect on drinking frequency and typical drinks consumed on an occasion as descriptive norms and traditional injunctive norms had effects less than .25. Drink-based injunctive norms were not, however, significantly associated with weekly drinking when accounting for traditional injunctive and descriptive norms. Traditional measures of injunctive norms have very small effects (d < .06) on all drinking behaviors in this sample. Finally, as shown in the bottom half of Table 4, drink-based personal approval had a unique small to medium effect on weekly drinking, drinking frequency, and typical number of drinks. These effects were larger than the effects of descriptive norms on different drinking behaviors but not as strong as the impact of traditional measures of personal approval.

General Discussion

This research offers a significant contribution to the literature as it offers both an explanation and solution for weak and inconsistent associations between injunctive norms and drinking in previous research. Results from two studies indicated traditional measures of injunctive norms that have low correspondence to typical drinking outcomes are not reliably associated with drinking and in some cases provide results that are opposite from theoretical explanations. In contrast, a drink-based measure of injunctive norms that corresponds closely to measures of descriptive norms and drinking outcomes is for the most part strongly, consistently, and uniquely associated with drinking outcomes in the expected direction. Hypothesis 1 was generally supported in both studies such that drink-based injunctive norms were significantly positively associated with drinking frequency and typical number of drinks consumed per occasion beyond the effects of the traditional measure of injunctive norms and descriptive norms. Drink-based injunctive norms were also significantly associated with weekly drinking in Study 1, but not in Study 2, after accounting for the traditional measure of injunctive norms and descriptive norms. Furthermore, hypothesis 2 was supported as drink-based personal approval was significantly positively associated with number of drinks consumed per week and drinking approval beyond the effects of the traditional measure of personal approval and descriptive norms.

One reason for conducting research on drink-based injunctive norms and personal approval measures is to better and more fully incorporate injunctive norms comparisons into personalized normative feedback interventions for alcohol consumption. Some research has shown the strongest effects for interventions that contain descriptive and injunctive norm

messages (Schultz et al. 2007). Extending this to alcohol consumption it is expected that injunctive norms may be key to preventing hazardous alcohol use on college campuses where drinking is prevalent. However, current traditional measures of injunctive norms are inadequate for this purpose. They are not consistently associated with drinking outcomes and it is not clear what students are approving of (items cover drinking on the weekend, drinking and driving, etc., and contain various normative referents). Therefore, having a measure of injunctive norms that directly corresponds to quantity and frequency of drinking is more usable in prevention efforts as they uniquely predict drinking and can provide clear comparisons of perceived and actual peer approval amount of and frequency of drinking.

Finally, there is evidence for the generalizability of the new drink-based measure in different college populations as well as with broad or narrow question focus. The findings of both studies are relatively comparable, albeit the results from Study 2 not supporting drink-based injunctive norms as a unique predictor of drinks per week over and above descriptive norms, suggesting that the small change in question wording did not have much impact. Thus, asking participants to enter the maximum number of drinks they (and/or others) would consider to be acceptable versus the number of drinks they (and/or others) would consider to be acceptable may be relevant for specific research questions or intervention goals but not for conceptualizations of injunctive norms and personal approval.

Limitations and future directions

While this study found support for the use of a drink-based conceptualization of injunctive norms and personal approval, findings indicate that traditional measures also have meaningful effects on drinking behaviors. This is likely due to the impact of perceptions of consequences on behavior (Patrick & Maggs 2011), and research is needed comparing traditional measures of injunctive norms and measures of attitudes towards consequences to determine if there is convergent validity between them. Furthermore, we did not assess same-sex norms. They should be considered in future research to test the impact of gender perceptions. Another limitation of the study was the use of cross-sectional data. Previous work indicates that both selection and socialization effects account for the association between perceived norms and behavior (e.g., Marks et al. 1992; Neighbors et al. 2006; Read et al. 2005). Additional longitudinal research comparing temporal associations between the drink-based measures of injunctive norms and drinking behavior would be valuable. Finally, as this was not a measurement paper, future work should also focus on the measurement development of drink-based measures of injunctive norms and personal approval.

It is also worth noting that injunctive norms are similar, but not identical, to the construct of subjective norms as defined by the Theory of Reasoned Action (TRA)/Theory of Planned Behavior (TPB; Ajzen 1991). These models have been found to predict behavior and provide a framework from which to design and implement interventions to reduce participation in unhealthy behaviors (Armitage & Conner 2001). In the TRA/TPB models, subjective norms inherently reference important others (e.g., close friends). Injunctive norms as typically assessed in the alcohol literature often use more distal reference groups (e.g., other students). Previous research has shown that traditional norms using distal reference groups are weakly if at all associated with drinking (Neighbors et al. 2008). The present research suggests that

the proximity of the reference group may be less influential in the association between drink-based injunctive norms and drinking relative to traditional norms. This is important because there are direct intervention implications in the utilization of norm components. These components often point out the discrepancy between perceived and actual norms. Presenting these disparities has been relatively effective with descriptive norms but has been less widely examined with injunctive norms. It is important to establish misperceptions between perceived and actual injunctive norms with distal reference groups because feedback can be constructed showing intervention recipients the inconsistency between their perception of others as approving of consuming more alcohol and actual approval levels.

Finally, the relatively low response rate from both samples may impact the generalizability of the findings to other student populations. This is partly due to the drinking criteria for inclusion in the study and the lower drinking population sampled. The two samples represent light and moderate drinking populations and future studies should examine the influence of injunctive norms and personal attitudes in different drinking samples and non-university samples.

Conclusion

The present research offers a novel approach for evaluating drink-based injunctive norms that has distinct advantages over traditional measures of injunctive drinking measures. Advantages of this approach include a reconceptualization of injunctive norms and personal approval that likely clarifies inconsistent findings between traditional measures and alcohol behaviors. In addition, drink-based injunctive norms and personal approval can be readily adapted in norms-based intervention components to provide concrete and understandable feedback demonstrating misperceptions in approval of heavy drinking. The new conceptualization of alcohol related injunctive norms and personal approval will allow researchers to build upon preexisting alcohol interventions using descriptive norms and has the potential to improve the impact of interventions as has been found in other normative intervention research (e.g., Schultz et al. 2007).

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Table 1

Means, Standard Deviations, and Correlations among Measures for Study 1

	Ow	n Drinking B	ehavior	I)escriptive No	sms	Dr	ink-Based Per Approval	sonal	Ι	Drink-Based njunctive Nor	l ms	Tradi Meas	ional ures
	Drinks per week	Drinking Frequency	Typical Drinks per Occasion	Drinks per week	Drinking Frequency	Typical Drinks per Occasion	Drinks per week	Drinking Frequency	Typical Drinks per Occasion	Drinks per week	Drinking Frequency	Typical Drinks per Occasion	Personal Approval	Injunctive Norms
	1	7	3	4	S	9	7	8	9	10	11	12	13	14
1	:													
2	0.74	I												
ю	0.74	0.57	:											
4	0.31	0.15	0.29	1										
5	0.08	0.18	0.09	0.40	;									
9	0.29	0.12	0.33	0.61	0.28	-								
7	0.72	0.56	0.54	0.30	0.09	0.25	I							
8	0.44	0.56	0.35	0.08	0.20	0.03	0.53	;						
6	0.63	0.41	0.58	0.36	0.04	0.46	0.68	0.40	1					
10	0.28	0.18	0.22	0.56	0.33	0.45	0.56	0.25	0.44	1				
11	0.03	0.16	0.02	0.18	0.52	0.08	0.15	0.45	0.05	0.40	;			
12	0.29	0.12	0.30	0.49	0.24	0.63	0.36	0.13	0.58	0.59	0.23	1		
13	0.55	0.54	0.46	0.18	0.10	0.14	0.57	0.56	0.46	0.24	0.15	0.25	:	
14	0.00	0.01	0.00	0.34	0.40	0.23	0.04	0.07	0.01	0.35	0.38	0.18	0.30	-
Mean	6.66	2.27	3.18	15.70	1.07	4.82	16.12	2.32	3.83	22.48	3.04	5.10	2.26	3.32
Standard Deviation	8.95	1.17	3.98	9.19	1.18	2.31	14.72	1.63	2.36	13.85	1.53	2.47	0.93	1.01

Note. N=2559. Given the sample size, all correlations of .07 and higher were significant at p < .001 and correlations of .04 or higher were significant at p < .05. Correlations of .10, .30, and .50 are considered small, medium, and large respectively (Cohen, 1992).

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Table 2

Regr	ession Results for In	junctiv	/e Nor	ms an	d Pers	onal A	pprov	al Pred	icting	Drink	ing Be	havior	s for St	udy 1
Step		M	eekly Dı	rinking		Dri	nking F	requenc	x	Typical	Drinks	per Occ	asion	
	Predictor	q	e ^p	t	p	q	e ^p	t	p	q	e ^b	t	p	
	Trad Ini Morme	0.01	1 01	24.0	000	000	1.00	000	0.02	0.00	1.00	0.01	100	

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Step		A	Veekly I	Jrinking	-0	1	5	-		TJ Prem			
	Predictor	q	eb	t	q	q	eb	t	q	q	eb	t	p
-	Trad. Inj. Norms	0.01	1.01	0.46	0.02	0.02	1.02	0.80	0.03	0.02	1.02	0.91	0.04
5	Trad. Inj. Norms Descriptive Norms	-0.14 0.05	0.87 1.06	5.11 15.01	0.20 0.60	-0.07 0.18	0.93 1.19	3.08 9.52	0.12 0.38	-0.07 0.20	0.94 1.22	2.78 16.75	0.11 0.66
	Trad. Inj. Norms Descriptive Norms DB Inj. Norms	-0.19 0.04 0.01	0.83 1.05 1.01	6.34 10.41 4.04	0.25 0.41 0.16	-0.10 0.13 0.08	0.90 1.14 1.09	4.27 6.50 5.27	0.17 0.26 0.21	-0.09 0.15 0.07	0.91 1.16 1.08	3.90 10.13 5.35	0.15 0.40 0.21
Step			Veekly	Drinking		Ā,	inking]	requency		Typica	l Drinks	per Occ	asion
	Predictor	٩	eb	÷	р	٩	ep	÷	q	٩	ep	-	P
1	Trad. Pers. Approval	0.86	2.36	27.54	1.09	0.51	1.66	26.63	1.05	0.64	1.90	23.89	0.94
5	Trad. Pers. Approval	0.80	2.23	26.70	1.06	0.49	1.63	26.24	1.04	0.60	1.82	23.94	0.95
	Descriptive Norms	0.04	1.04	12.67	0.50	0.11	1.12	7.30	0.29	0.17	1.18	16.75	0.66
3	Trad. Pers. Approval	0.48	1.62	16.08	0.64	0.32	1.38	15.61	0.62	0.42	1.53	17.10	0.68
	Descriptive Norms	0.02	1.02	8.06	0.32	0.04	1.04	2.78	0.11	0.07	1.08	7.44	0.29
	DB Pers. Approval	0.04	1.04	20.01	0.79	0.22	1.25	18.74	0.74	0.22	1.24	18.37	0.73

steps of the analysis.

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Table 3

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Means, Standard Deviations, and Correlations among Measures for Study 2

_ .					•			Approval			Norms		Meas	ures
-	Drinks per veek	Drinking Frequency	Typical Drinks per Occasion	Drinks per week	Drinking Frequency	Typical Drinks per Occasion	Drinks per week	Drinking Frequency	Typical Drinks per Occasion	Drinks per week	Drinking Frequency	Typical Drinks per Occasion	Peers. Approval	Injunctive Norms
1		2	3	4	5	6	7	8	6	10	11	12	13	14
1														
2 (.70	1												
3).68	0.50	1											
4 ().22	0.12	0.17	I										
5 (.00	0.13	-0.04	0.34	;									
9).14	0.05	0.18	0.53	0.28	1								
7 (.50	0.36	0.38	0.37	0.06	0.28	I							
8 ().37	0.52	0.22	0.15	0.30	0.06	0.46	;						
) 6).52	0.38	0.50	0.24	-0.01	0.31	0.72	0.45	1					
10 (.15	0.09	0.11	0.58	0.34	0.41	0.40	0.14	0.25	-				
11 (.08	0.18	-0.01	0.26	0.60	0.19	0.13	0.39	0.08	0.36	1			
12 ().23	0.12	0.26	0.36	0.22	0.52	0.37	0.17	0.46	0.51	0.38	-		
13 ().37	0.43	0.32	0.07	0.08	-0.02	0.44	0.56	0.45	0.08	0.17	0.15	1	
- 14	-0.05	-0.02	-0.04	0.18	0.36	0.16	0.05	0.16	0.03	0.23	0.37	0.20	0.24	-
Mean	3.06	0.58	1.75	13.88	2.21	4.39	8.48	1.29	3.91	14.57	1.88	5.12	3.32	4.78
Standard (Deviation	5.26	1.03	2.69	11.45	1.56	3.10	11.76	1.41	2.67	13.83	1.42	2.84	1.29	1.25

Note. N=1189. Given the sample size, all correlations of .13 and higher were significant at *p* < .001 and correlations of .07 or higher were significant at *p* < .05. Correlations of .10, .30, and .50 are considered small, medium, and large respectively (Cohen, 1992).

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Step		-	Veekly I	rinking		Dri	nking F	requenc	, A	Typical	Drinks	per Occ	asion
	Predictor	q	eb	t	q	q	eb	t	q	q	eb	t	q
-	Trad. Inj. Norms	0.01	1.01	0.20	0.01	0.12	1.12	3.03	0.18	0.01	1.01	0.22	0.01
7	Trad. Inj. Norms Descriptive Norms	-0.06 0.04	0.95 1.04	0.90 5.29	0.05 0.31	-0.10 0.18	0.90 1.20	2.65 5.56	0.15 0.32	-0.08 0.10	0.97 1.11	0.69 5.40	0.04 0.31
ω	Trad. Inj. Norms Descriptive Norms DB Inj. Norms	-0.05 0.04 0.00	0.95 1.04 1.00	0.84 4.24 0.00	0.05 0.25 0.00	-0.14 0.09 0.20	0.87 1.09 1.22	3.54 2.21 4.71	0.21 0.13 0.27	-0.04 0.05 0.11	0.97 1.05 1.12	0.87 2.18 5.23	0.05 0.13 0.30
Step	Predictor	y d	Veekly I e ^b)rinking t	q	b Dri	nking F e ^b	requenc	yd	Typical b	l Drinks e ^b	per Occ t	asion d
- 1	Trad. Pers. Approval	0.94	2.55	18.08	1.05	0.67	0.96	4.24	1.15	0.63	1.88	16.20	0.94
7	Trad. Pers. Approval Descriptive Norms	0.90 0.03	2.46 1.03	17.70 4.78	1.03 0.28	0.64 0.12	1.90 1.12	13.71 3.89	0.80 0.23	0.63 0.09	1.88 1.09	16.37 6.15	0.95 0.36
б	Trad. Pers. Approval Descriptive Norms DB Pers. Approval	0.74 0.02 0.04	2.10 1.02 1.04	12.96 2.51 5.07	0.75 0.15 0.29	0.37 0.01 0.30	1.45 1.01 1.35	6.86 0.40 8.67	0.40 0.02 0.50	0.47 0.05 0.14	1.60 1.05 1.15	11.30 3.42 7.19	0.66 0.20 0.42
Notes: 1	V=1189. The e ^b column c	contains	exponer	ttiated be	sta value	s. Trad. I	nj. Norn	us repres	ents tra	ditional n	ieasures	of injune	ctive nor

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www.in-1102. In er-commun contains exponentiated beta values. Trad. Inj. Norms represents traditional measures of injunctive norms. DB Inj. Norms represents drink-based measures of injunctive norms. Trad. Pers. Approval represents traditional measures of personal approval. Gender was controlled for in all steps of the analysis.