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The Effects of Descriptive and Injunctive Peer Norms on Young Adult Alcohol Use

A Capstone Project Submitted in Partial Fulfillment of the
Requirements of the Renée Crown University Honors Program at
Syracuse University

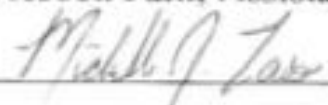
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Abstract

Descriptive peer norms refer to one's perception of their peer's alcohol use, while injunctive peer norms refer to one's perception of their peer's approval of alcohol use. Current literature has found that both norms are positively associated with alcohol use among young adults, but it remains unknown whether one norm has a greater influence on alcohol use than the other. The purpose of the current study was to explore this gap in the literature and examine the relative influence of both descriptive and injunctive norms on alcohol consumption. One hundred Caucasian, moderate-heavy drinking young adults completed a baseline questionnaire assessing peer norms and alcohol use over the past 90 days before participating in three, 10-minute taste test sessions; both self-reported alcohol use over the past 90 days and measured amount of alcohol consumed by the participant in the experimental session were used as alcohol outcomes. In general, both descriptive and injunctive peer norms were significantly associated with greater alcohol use, with injunctive norms influencing a wider range of drinking behaviors than descriptive norms. Furthermore, contrary to study hypotheses, descriptive and injunctive peer norms appeared to have overlapping influences on alcohol use. These findings provide insight into the social factors that motivate alcohol use among young adults. Future studies are needed to examine the impacts of both descriptive and injunctive peer norms on subsequent alcohol use.

Keywords: descriptive norms, injunctive norms, alcohol, young adulthood

Executive Summary

Young adult alcohol use is a prevalent and serious public health concern in the United States. According to a national survey in 2001, over 70% of young adults reported consuming alcohol in the past year, and drinkers reported reaching peak levels of alcohol consumption during their young adult years (Chen, Dufour, & Yi, 2004). Although young adult alcohol consumption is motivated by a variety of factors, social factors specifically have been demonstrated to have a significant impact upon young adult alcohol use (Lyvers et al., 2010). For example, young adults consumed significantly more alcohol when in the presence of drinking peers than when in the presence of non-drinking peers or when alone (Caudill & Marlatt, 1975; Overbeek et al., 2011; Larsen et al., 2012). Given the prevalence of young adult alcohol use and the significant impact of social factors on alcohol consumption in this population, additional research is needed to better identify and understand peer influences on young adult drinking.

Descriptive peer norms

Descriptive norms refer to a young adult's perception of other's frequency and quantity of drinking (Borsari and Carey, 2003). Young adults consistently report their peers' drinking as higher than their own drinking (Baer & Carney, 1993; Baer, Stacy, and Larimer, 1991; Lewis and Neighbors, 2004) and frequently overestimate actual peer drinking rates (Baer, Stacy and Larimer, 1991; Weschler and Kuo, 2000). This overestimation has been linked to higher levels of alcohol consumption in young adults (Baer, Stacy, and Larimer, 1991), suggesting that young adult alcohol consumption may increase as descriptive peer norms increase.

Injunctive peer norms

Injunctive norms refer to how a young adult perceives their peers' approval of drinking. Previous research has found that individuals often rate others as more accepting of drinking than themselves (Borsari & Carey, 2003; Lewis & Neighbors, 2004; Perkins and Berkowitz, 1986b; Thombs et al., 2005), and these elevated perceptions of peer approval may promote young adults to believe that heavy drinking behaviors are socially acceptable (Borsari & Carey, 2001), thereby increasing a young adult's personal alcohol consumption.

Specific Aims

While the influence of both descriptive and injunctive norms on alcohol use is well-documented in past research (Borsari and Carey, 2001; Lee et al., 2007; Perkins, 2002), it remains unknown whether one norm weighs more heavily on alcohol consumption among young adults. The purpose of the current study was to examine the independent and relative effects of descriptive and injunctive norms on alcohol consumption in a sample of young adults. Specially, it explored whether one norm had a larger effect on alcohol consumption than the other. It was hypothesized that both injunctive and descriptive norms would influence young adult alcohol consumption, but injunctive norms would have a more significant impact than descriptive norms.

Study Design

Participants were recruited through flyers posted throughout the Syracuse University campus and surrounding community, class and email solicitation, and various online postings. Participants were required to be between 21 and 30 years old, Caucasian, and moderate-heavy drinkers. Exclusion criteria included a variety of factors contraindicated with alcohol use (e.g., certain prescription medications, medical conditions, allergies, etc.), current or past psychiatric concerns, a blood alcohol content (BAC) > 0.00% at the beginning of the experimental session, weight below 15% of ideal body weight, or (for females) a positive pregnancy test result.

After arriving to the laboratory and providing informed consent, participants completed a baseline questionnaire that assessed demographics, past 90-day alcohol use, and both descriptive and injunctive peer norms. Descriptive peer norms were collected with a 5-item measure (e.g. “How many of your close friends would you estimate get drunk at least once a week?”; Curran, Stice & Chassin, 1997). Injunctive peer norms were collected using a 5-item measure (e.g. “How do you think your close friends feel (or would feel) about you drinking four or five drinks regularly?”; Chassin et al., 1996). Self-reported alcohol use over the past 90 days was collected through the Timeline Follow Back calendars (Sobell & Sobell, 1992), which produced four alcohol use outcomes: number of heavy-drinking days, maximum alcohol use, frequency of alcohol use, and quantity of alcohol use.

Following this baseline questionnaire, participants completed three, 10-minute alcohol taste test sessions in which they voluntarily tasted from two vodka- tonic samples (0.5 standard drinks per sample) during each session. Participants were randomly assigned to one of three drinking conditions: drinking alone, drinking with one heavy-drinking peer confederate, or drinking with three heavy-drinking peer confederates. After these taste test sessions, participants watched an alcohol-related film, allowing time for participant BAC to decrease. After participant BAC was equal to or less than 0.02%, participants were debriefed on study hypotheses and awarded compensation for participation.

Results

Participants endorsed higher injunctive norms ($M = 13.17$, $SD = 3.55$) than descriptive norms ($M = 11.40$, $SD = 4.00$). Greater injunctive norms were moderately correlated with greater self-reported frequency of alcohol use and number of heavy-drinking days ($r = .27 - .79$, $p < .001$). After controlling for the effects of gender on alcohol use, young adults with higher

descriptive norms or higher injunctive norms reported greater maximum alcohol use and number of heavy-drinking days. While descriptive norms explained additional variance in several self-reported alcohol outcomes over and above the effects of injunctive peer norms and gender, this additional variance was nonsignificant. Thus, descriptive and injunctive peer norms explained similar variance in young adult alcohol use outcomes.

Conclusions

The current study examined the independent and relative influences of descriptive and injunctive peer norms on young adult alcohol use. Results indicated that both descriptive and injunctive peer norms had independent, significant impacts upon young adult heavy drinking (e.g., maximum alcohol use, number of heavy-drinking days). However, the influences of descriptive and injunctive peer norms on a variety of alcohol outcomes may overlap; that is young adults' perceptions of their peers' drinking and peers' approval of drinking may both positively influence alcohol use but in a similar manner. The present study contributes to current understanding of peer norms and their influences on alcohol use in young adults by suggesting that both descriptive and injunctive peer norms have comparable associations with young adult drinking. Future, prospective studies with more diverse samples are needed to examine the impacts of descriptive and injunctive peer norms on subsequent alcohol use among young adults.

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Introduction

Young adult drinking is a prevalent public health concern that can result in significant, negative consequences. As many as 70% of young adults in the United States have reported consuming alcohol in the past year, according to results from a national survey conducted in 2001 (Chen, Dufour, & Yi, 2004). With close to three-quarters of young adults consuming alcohol, previous research that shows drinkers typically reach peak levels of alcohol consumption during these young adult years raises serious concerns about possible alcohol misuse and abuse in this population (Chen, Dufour, & Yi, 2004; Fillmore et al. 1991; Naimi et al. 2003). Excessive alcohol use among young adults can result in serious consequences for the drinker and society. Academically, excessive alcohol use predicted a 12%-18% drop in cumulative GPA (Wolaver, 2002), and over 20% of students reported performing poorly on an assignment or missing a class during the past year due to alcohol or other drug use (Perkins, 2002). Alcohol use has also been shown to have significant interpersonal consequences. Approximately 30% of young adults were involved in a fight or argument and 25% engaged in unprotected or unintended sexual activity as a result of their drinking or drug use (Perkins, 1992). Furthermore, at least 50% of college sexual assaults were associated with alcohol use (Abbey, 2002). Alcohol use can also have deadly consequences. Although young adults only account for 15% of licensed drivers in the United States, they constitute 28% of drinking-driver fatalities and 30% of all alcohol-related driving fatalities (Campbell, Zobeck & Bertolucci, 1995; Quigley & Marlatt, 1996). Thus, it is important to understand what influences young adult alcohol use.

Social motives for drinking have significant effects on young adult alcohol consumption (Lyvers et al., 2010). Young adults consumed significantly more alcohol when in the presence of

a heavy-drinking peer than in the presence of a light-drinking or non-drinking peer (Caudill & Marlatt, 1975). More recently, young adult alcohol consumption was found to be significantly greater in the presence of a confederate drinking peer than in isolation (Larsen et al., 2012). Indeed, the mere presence of drinking peers, regardless of their relationship to the young adult, has a significant effect on young adult alcohol consumption (Overbeek et al., 2011). Heavy-drinking specifically may be strongly influenced by social facilitation, especially in young adult males (Thombs, Beck, & Mahoney, 1993). Given the prevalence of young adult alcohol use and the effect of social factors on alcohol consumption, additional research is necessary to better identify and understand the effects of these peer drinking effects.

Descriptive norms refer to a young adult's perception of other's frequency and quantity of drinking (Borsari & Carey, 2003). Young adults consistently report their peers' drinking as higher than their own drinking (Baer & Carney, 1993; Baer, Stacy, and Larimer, 1991; Lewis & Neighbors, 2004) and frequently overestimate actual peer drinking rates (Baer, Stacy & Larimer, 1991; Weschler & Kuo, 2000). This overestimation has been linked to higher levels of alcohol consumption in young adults (Baer, Stacy, & Larimer, 1991). For example, over 25% of young adults have overestimated the binge drinking rate at their school, and more than half of these young adults were classified as occasional or frequent binge drinkers (Wechsler & Kuo, 2000). Thus, perceived descriptive norms play a significant role in young adult alcohol consumption.

Injunctive norms refer to how a young adult perceives their peers' approval of drinking. Injunctive norms assist young adults in determining acceptable versus unacceptable drinking behavior (Borsari & Carey, 2003; Cialdini et al., 1990). Previous research has found that individuals often rate others as more accepting of drinking behaviors than they rate themselves (Borsari & Carey, 2003; Lewis & Neighbors, 2004; Perkins & Berkowitz, 1986b; Thombs et al.,

2005), and these elevated perceptions of peer approval could promote young adults to believe that heavy drinking behaviors are more socially acceptable (Borsari & Carey, 2001). Similar to descriptive norms, high injunctive norms seem to correlate with increased alcohol consumption; Perkins (2002) found that being surrounded by peers with high injunctive norms increases alcohol consumption, over and above the effects of social background factors (e.g., age, number of close friends). High injunctive norms may also predict future alcohol misuse. For example, members of Greek organizations with higher injunctive norms were more likely to abuse alcohol or have alcohol-related problems in the future (Larimer et al., 2004). Therefore, perceived injunctive norms also play a significant role in young adult alcohol consumption.

While the influence of both descriptive and injunctive norms on alcohol use is well documented in past research (Borsari & Carey, 2001; Lee et al., 2007; Perkins, 2002), it remains unknown whether one norm weighs more heavily on alcohol consumption among young adults. Existing research examining the relative influences of descriptive and injunctive norms on young adult drinking has been mixed. Interventions have successfully reduced heavy drinking when targeting descriptive norms (Borsari & Carey, 2000; Lewis et al., 2007; Neighbors, Larimer, & Lewis, 2004), although those targeting injunctive norms have produced inconclusive findings (Schroeder & Prentice, 1998). Several studies have noted immediate effects of descriptive norms and longer-lasting effects of injunctive norms on young adult alcohol consumption. While both descriptive and injunctive norms predicted drinking behavior, injunctive norms were better predictors of future drinking and alcohol-related problems (Larimer et al., 2004) and had a broader impact on drinking behavior than descriptive norms (Cialdini et al., 1990). In contrast, descriptive norms were found to have a significant effect on young adult drinking regardless of the proximity of the referent group (e.g., best friends, close friends, acquaintances, peers), while

injunctive norms had a complex relationship with drinking and were more significant than descriptive norms only when referencing close friends. In sum, existing research suggests that both norms significantly influence young adult drinking, although injunctive norms may have a more complex and significant relationship with alcohol consumption.

The purpose of the current study was to examine the effects of both descriptive and injunctive norms on alcohol consumption in a sample of young adults. Specially, we sought to explore the relative influence of descriptive and injunctive norms on alcohol consumption; that is, to examine whether one norm had a larger effect on alcohol consumption than the other. We randomly assigned 100 young adults to voluntarily consume alcohol with none, one, or three heavy-drinking peer confederates. We hypothesized that both injunctive and descriptive norms would influence young adult alcohol consumption, but injunctive norms would have a more significant impact than descriptive norms. Thus, we expected that young adults with higher descriptive or injunctive peer norms would drink more than young adults with lower norms, regardless of the number of heavy-drinking peer confederates. Furthermore, we predicted that injunctive norms would have a greater influence on young adult alcohol consumption than descriptive norms.

Method

Participants

One hundred eligible participants (52% female; mean age = 22.36 [SD = 2.11]) completed the study. Participants were recruited through posted flyer advertisements located throughout the Syracuse University campus and the surrounding community, class and email solicitation, Syracuse University's SONA website which offers research credit to satisfy class participation requirements for certain introductory psychology classes at Syracuse, Craigslist, Facebook, newspaper advertisements, and referrals from a similar study being conducted in the department. Participants were required to be between 21 and 30 years old, Caucasian, and moderate-heavy drinkers. If recruited through SONA, participants received 3.5 SONA credits; if recruited through any other means, participants were compensated \$5 per every half hour spent in the laboratory, rounding up to the nearest half hour.

To determine eligibility, participants were required to complete an eligibility screener over the phone with one of the laboratory researchers. Exclusion criteria included: relevant allergies or reactions, current medication or medical conditions contraindicated by alcohol consumption, self-reported use of 15+ cigarettes a day, current or past psychiatric issues such as depression or bipolar disorder, and current or past alcohol use disorder. Furthermore, participants who were found eligible after completing the phone screener were found ineligible upon entering the lab if they had a BAC > 0.00% at the beginning of the session, were below 15% of their ideal body weight, or (for females) produced a positive pregnancy test result. Participants who were found ineligible upon entering the lab were compensated for their time.

Measures

Alcohol consumed. After each of the three taste test sessions, participants' alcohol consumption was recorded by measuring the amount of alcohol remaining in the sample cups; this value was then subtracted from the total available alcohol amount (22.5 fl oz) to compute the amount of alcohol consumed. Volume was measured in fluid ounces.

Blood Alcohol Content (BAC). BAC measures the concentration of alcohol in the blood. It is expressed as the weight of ethanol, measured in grams, in 100 milliliters of blood. Participants' BAC was taken at least six times throughout the study: initial BAC at beginning of the session, one after each of the three taste tests, and at least two after the session to ensure participant's BAC < 0.02%.

Baseline alcohol use. Participants completed Timeline Follow Back calendars (Sobell & Sobell, 1992) in which they self-reported the number of standard drinks they consumed on a given day over the past 90 days. Relevant social, sport, and television events were labeled on the calendars to help participant memory (e.g., Syracuse basketball games, the season premiere of HBO's popular show *True Blood*, the World Cup soccer game between USA and Belgium, Columbus Day). Responses were recoded into four variables: number of heavy-drinking days (number of days a participant reported drinking 4+ [for females] or 5+ [for males] drinks), frequency of alcohol use (number of days a participant reported drinking over the past 90 days), maximum alcohol use on a single drinking day, and quantity of alcohol use (average number of drinks consumed on a drinking day over the past 90 days).

Peer descriptive alcohol norms. Participants were asked to estimate how much their close friends drank using a 5-item measure (e.g., "How many of your close friends would you estimate get drunk at least once a week?") using a 5-point scale including 0 (*none*), 1 (*a few*), 2

(*some*), 3 (*most*), and 4 (*all*; Curran, Stice & Chassin, 1997). A sum score was used for the analyses.

Peer injunctive alcohol norms. Participants were asked to estimate how their close friends feel about their drinking habits using a 5-item measure (e.g., “How do you think your close friends feel (or would feel) about you drinking four or five drinks regularly?”) using a 5-point scale including 0 (*strongly approve*), 2 (*neutral*), and 4 (*strongly disapprove*; Chassin et al., 1996). A sum score was used for the analyses.

Procedure

All study procedures were reviewed and approved by the Institutional Review Board (IRB). The study was advertised as an alcohol taste test interested in participants’ opinions of alcoholic drinks and an alcohol-related film. Potential participants completed a phone eligibility screen to assess eligibility criteria. Laboratory sessions were scheduled during afternoons and evenings, when alcohol consumption is prevalent. Upon entering the lab, eligible participants were briefed by a research assistant on study procedures and provided informed consent. Participants agreed not to drive for a minimum of two hours after completion of the study; if needed, alternative transportation was arranged, with compensation up to \$15 for public transportation. Research assistants verified participant age by collecting two forms of identification and also measured participant height, weight, and initial BAC. Additionally, females were required to give a urine sample for a pregnancy test. Any female who produced a positive test result was provided with counseling service references and was not allowed to continue participation. Participants then completed a baseline questionnaire, which assessed demographics, past-month alcohol use, and peer norms.

Participants were then moved into a bar lab to participate in three, 10-minute alcohol taste test sessions. During each taste test, participants voluntarily tasted two vodka- tonic mixed alcoholic drinks (which included 0.75 fl oz 80-proof vodka, 3 fl oz tonic water, and 0.5 teaspoon lime juice) that were each equivalent to 0.5 standard drinks; therefore, participants who finished all their drinks consumed a total of three standard drinks over the three taste test sessions. Participants were randomly assigned to one of three drinking conditions: drinking alone, drinking with one heavy-drinking peer confederate, or drinking with three heavy-drinking peer confederates. Confederates were instructed to model heavy drinking by consuming all of their drinks and to socialize with the participant. The research assistant observed the taste test sessions through a one-way mirror. Research assistants ended the sessions immediately if the participant displayed any signs of alcohol poisoning or unacceptable behaviors including aggressive language, verbally requesting to end the taste test, and vomiting. After each of the taste tests, participants completed a questionnaire on their opinions of the drinks. Participants rated their opinions of the drinks and completed additional questions as part of another research question. BAC was taken after each questionnaire. The maximum allowable BAC for this study was a 0.08%; participants with a BAC reading greater than or equal to 0.07% were not allowed to begin another taste test session. After the three taste tests, participants were moved into an individual room to evaluate an alcohol-related film, allowing time for participant BAC to decrease. A conclusion questionnaire was given which asked participants about their overall opinion of the study. Proper compensation and debriefing protocol followed after the participant's BAC was less than or equal to 0.02% after two readings. Debriefing protocol included a reminder that participants not drive for a minimum of two hours after session

completion. Participants were informed of the true purpose of the study and were given the choice whether they would allow use of their data in the current study.

Results

Descriptive Statistics

Pearson correlation coefficients and means (with standard deviations in parentheses) of study variables are presented in Table 1. Descriptive and injunctive peer norms were moderately correlated, although not enough to be considered interchangeable ($r = .56, p < .001$). Thus, we conducted subsequent analyses with descriptive and injunctive peer norms as two distinct, albeit related, predictors of alcohol use.

As assessed through the Timeline FollowBack calendars, participants reported drinking on an average of 35% of the past 90 days ($M = 31.53, SD = 15.08$) and drinking heavily on 40% of those drinking days ($M = 12.38, SD = 12.54$). On average, participants endorsed slightly more injunctive norms ($M = 13.17, SD = 3.55$) than descriptive norms ($M = 11.40, SD = 4.00$), which were measured on the same scale with reported descriptive norms sum scores ranging from 0 - 20 and injunctive norms sum scores ranging from 6 - 20. Greater injunctive norms were moderately correlated with greater frequency of alcohol use and number of heavy-drinking days ($r = .27 - .79, p < .001$).

Linear Regressions

Results from linear regressions examining the impact of descriptive and injunctive peer norms on alcohol use outcomes are presented in Table 2. We examined the influence of descriptive and injunctive peer norms separately on alcohol use outcomes, then the influences of injunctive peer norms over and above the effects of descriptive peer norms. We included gender as a covariate in all analyses, due to its impact on alcohol use outcomes. We also included the presence of a heavy-drinking peer confederate (0 = no heavy-drinking peer confederate; 1 = at

least one heavy-drinking peer confederate) as a covariate only in analyses predicting amount of alcohol consumed in the session.

Descriptive peer norms predicting baseline alcohol use. Greater descriptive norms were significantly associated with greater maximum alcohol use ($\beta = .23, p = .015$) and number of heavy-drinking days ($\beta = .23, p = .029$), after accounting for participant gender. Together, descriptive norms and participant gender accounted for 23% of the variation in maximum alcohol use ($R^2 = .23, p < .001$), 16% of the variation in quantity of alcohol use ($R^2 = .16, p = .001$) and 8% of the variation in number of heavy-drinking days ($R^2 = .08, p = .026$). Descriptive norms and gender were not significantly associated with and did not account for a significant variance in frequency of alcohol use ($R^2 = .04, p > .05$). Thus, young adults who reported greater alcohol use by their close friends also reported greater personal maximum alcohol use, quantity of alcohol use, and number of heavy-drinking days after accounting for the effect of gender on alcohol use.

Injunctive peer norms predicting baseline alcohol use. Injunctive norms were significantly associated with greater maximum alcohol use ($\beta = .20, p = .036$), number of heavy-drinking days ($\beta = .28, p = .006$), and frequency of alcohol use ($\beta = .22, p = .035$), after accounting for participant gender. Injunctive norms and participant gender accounted for 22% of the variation in maximum alcohol use ($R^2 = .22, p < .001$), 16% in alcohol use quantity ($R^2 = .16, p < .001$), and 11% in number of heavy-drinking days ($R^2 = .11, p = .006$). Injunctive norms and gender did not account for any variance in frequency of alcohol use, after controlling for gender ($R^2 = .06, p > .05$). Thus, young adults who reported greater approval of alcohol use by their close friends also reported greater personal maximum alcohol use, quantity of alcohol use, and number of heavy-drinking days after accounting for the effect of gender on alcohol use.

Descriptive and injunctive peer norms together predicting baseline alcohol use.

Descriptive peer norms, injunctive peer norms, and gender together accounted for 27% of the variation in maximum alcohol use ($R^2 = .27, p < .001$), 19% of the variation in alcohol use quantity ($R^2 = .20, p = .001$), and 12% of the variation in number of heavy-drinking days ($R^2 = .12, p = .019$). Although we examined possible interactions between descriptive and injunctive peer norms on alcohol use (i.e., whether the relationship between descriptive norms and alcohol use changed based on injunctive norms or vice versa), all interactions were non-significant and excluded from final models. After accounting for the influences of gender and descriptive peer norms on alcohol use, injunctive peer norms were only significantly associated with maximum alcohol use ($\beta = .55, p = .034$) and were not significantly associated with frequency of alcohol use, quantity of alcohol use, or number of heavy-drinking days.

After accounting for the influences of gender and descriptive peer norms on alcohol use, injunctive peer norms accounted for an additional 4% of the variance in number of heavy-drinking days, 2% of the variance in frequency of alcohol use, and 4% of the variance in maximum drinks. That is, injunctive peer norms accounted for an additional amount of variance in number of heavy-drinking days, frequency of alcohol use, and number of maximum drinks over and above the effects of descriptive peer norms and gender. However, this additional amount of variance explained by injunctive peer norms was non-significant. Thus, descriptive and injunctive peer norms appear to be explaining similar sources of variance in number of heavy-drinking days, frequency of alcohol use, and number of maximum drinks.

Descriptive and injunctive peer norms together predicting measured alcohol consumption. Although we examined possible interaction effects between descriptive and injunctive peer norms, none of the results were significant and were excluded from final models.

Gender, confederate presence, and descriptive peer norms accounted for 18% of variation in amount of alcohol consumed during the session ($R^2 = .18, p = .001$). Similarly, injunctive peer norms also accounted for 18% of variation in amount of alcohol consumed during the session, after accounting for the effects of gender and confederate presence ($R^2 = .18, p = .001$).

However, when including both descriptive and injunctive norms together in the model, no additional variance in alcohol consumed during the session was explained. That is, young adults' perceptions of their peers' approval of drinking did not have any additional influence on alcohol consumed during the session over and above the influence of young adults' perceptions of their peers' drinking habits. Thus, descriptive and injunctive peer norms' influences on alcohol consumption appear to overlap.

Discussion

The current study explored the influence of descriptive and injunctive peer norms on young adult alcohol use. Specifically, it examined the relative influences of descriptive and injunctive peer norms on young adult self-reported and observed alcohol use; that is, it explored whether injunctive peer norms had a significant effect on alcohol consumption after accounting for descriptive peer norms. The current study assessed participants' self-reported alcohol use and their actual alcohol consumption in the laboratory, which expands upon previous research by helping to address any self-report biases. Results indicated that both descriptive and injunctive peer norms had individual, significant impacts upon young adult alcohol use, although their influences appeared to be overlapping.

Findings suggest that both descriptive and injunctive peer norms are significantly associated with alcohol use, with injunctive norms influencing a greater range of drinking behaviors than descriptive norms. Injunctive norms were positively correlated with self-reported alcohol use frequency and number of heavy-drinking days while, in contrast, descriptive norms were not significantly correlated with any self-reported or observed alcohol use outcomes. Thus, young adults with greater perceived peer approval of alcohol use may drink more frequently and drink heavily more often. In addition, after accounting for the influence of gender on alcohol use, injunctive norms were significantly associated with self-reported maximum alcohol use, frequency of alcohol use, and number of heavy-drinking days, while descriptive norms were only significantly associated with self-reported maximum alcohol use and number of heavy-drinking days. Thus, while a young adults' perception of how much their peers drink may significantly influence their drinking behavior, a young adults' perception of how much their peers approve of

drinking may influence a wider range of risky drinking behaviors, which is consistent with previous research (Cialdini et al., 1990; Larimer et al., 2004).

In regards to the influence of injunctive norms over and above the effects of descriptive peer norms, results suggested that descriptive and injunctive peer norms relate with alcohol use in a similar manner. Injunctive norms accounted for additional variation in participants' self-reported maximum alcohol use, frequency of alcohol use, and number of heavy-drinking days above and beyond the effects of descriptive peer norms and gender, although the magnitude of this effect was relatively small and non-significant (i.e., addition of injunctive norms into models with both descriptive norms and gender explained only 2% of additional variance in frequency of alcohol use). Thus, young adults' perceptions of their peers' drinking and peers' approval of drinking may both positively effect alcohol use, although their influences may be overlapping. Furthermore, no significant interaction effects between descriptive and injunctive peer norms were found which suggests peer norms provide no synergistic influence on alcohol use or consumption. These findings are consistent with previous research that has suggested descriptive and injunctive peer norms independently predict alcohol use (Cialdini et al., 1990). Our study though was the first to examine whether descriptive or injunctive peer norms have a greater influence on young adult drinking behavior. Our hypothesis that injunctive norms influence young adult alcohol use more than descriptive norms was not supported, as descriptive and injunctive norms appeared to have overlapping influences on young adult alcohol use, accounting for approximately equal amounts of variation in both self-reported and observed alcohol outcomes.

Although the present study expanded existing literature, it is important to interpret its findings in the context of several limitations. First, these findings are cross-sectional and they

cannot be interpreted to suggest that increased peer norms cause greater alcohol use. Second, these findings were based upon a limited sample of Caucasian, moderate-heavy drinkers between 21-30 years old who had no psychiatric comorbidities (including current or past alcohol use disorder). The relationship between peer norms and alcohol use may differ among young adults with clinical symptoms of depression or anxiety, or among young adults who are classified as light to moderate drinkers. Similarly, the current study cannot speak to the relationship between peer norms and alcohol use among young adults of other, non-Caucasian racial groups. Third, although we recruited participants through a variety of recruitment methods from Syracuse University and the surrounding community, 85% of our participants were university students. Thus, our results may primarily reflect the relationship between peer norms and college students' alcohol use, rather than young adults' alcohol use. Finally, providing only vodka-tonic samples could have limited participant alcohol consumption, and thus the relationship observed between peer norms and actual alcohol consumption, as compared to providing participants with an alcoholic drink of their choice.

Despite these limitations, the present study contributes to current understanding of peer norms and their influences on alcohol use in young adults by suggesting that both descriptive and injunctive peer norms have comparable associations with young adult drinking. Future, prospective studies with more diverse samples are needed to examine the impacts of descriptive and injunctive peer norms on subsequent alcohol use among young adults.

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Table 1
Bivariate correlations among study variables

Variables	<i>M (SD)</i>	<i>r</i>						
		1.	2.	3.	4.	5.	6.	7.
1. Descriptive peer norms	11.40 (4.00)	1						
2. Injunctive peer norms	13.17 (3.55)	.56***	1					
3. Past maximum alcohol use	8.99 (4.59)	.17	.17	1				
4. Past alcohol use frequency	31.53 (15.08)	.17	.21*	.31**	1			
5. Past alcohol use quantity	3.92 (2.23)	.10	.15	.79***	.10	1		
6. Past heavy drinking	12.38 (12.54)	.20	.27**	.64***	.53***	.73***	1	
7. Amount consumed	16.49 (6.63)	.11	.15	.18	.25*	.12	.11	1

Note. $N = 90 - 102$ due to missing data.

* $p < .05$. ** $p < .01$. *** $p < .001$.

Table 2
Regressions of descriptive and injunctive norms on predicting alcohol use outcomes

Variables	Alcohol use outcomes				
	Frequency	Quantity	Heavy-drinking	Maximum	Amount (fl oz.)
Gender	0.10	.36***	.17	.42***	.31**
Confederate presence	-	-	-	-	.28**
R^2	.01	.13***	.03	.18***	.18**
Descriptive peer norms	.18	.17	.23*	.23*	.11
Gender	.12	.39***	.20	.45***	.32**
Confederate presence	-	-	-	-	.26**
R^2	.04	.16***	.08*	.23***	.18***
Injunctive peer norms	.22*	.18	.28**	.20*	.11
Gender	.11*	.38***	.19	.43***	.32**
Confederate presence	-	-	-	-	.26**
R^2	.06	.16***	.11**	.22***	.18***
Descriptive peer norms	.21	.60	.41	.74*	.08
Injunctive peer norms	.27	.55	.48	.55*	.07
Gender	.12	.36***	.18	.42***	.32**
Confederate presence	-	-	-	-	.25*
R^2	.06	.19***	.12*	.27***	.18***

Note. $N = 90 - 102$ due to missing data.

* $p < .05$. ** $p < .01$. *** $p < .001$.