Published in final edited form as:

Addict Behav. 2013 December ; 38(12): 2918–2923. doi:10.1016/j.addbeh.2013.08.027.

Social influence on temptation: perceived descriptive norms, temptation and restraint, and problem drinking among college students

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Abstract

Temptation and restraint have long been associated with problematic drinking. Among college students, social norms are one of the strongest predictors of problematic drinking. To date, no studies have examined the association between temptation and restraint and perceived descriptive norms on drinking and alcohol-related problems among college students. The purpose of this study was to examine whether perceived descriptive norms moderated the relationship between temptation and restraint and drinking outcomes among college students. Participants were 1,095 college students from a large, public, culturally-diverse, southern university who completed an online survey about drinking behaviors and related attitudes. Drinks per week and alcohol-related problems were examined as a function of perceived descriptive norms, Cognitive Emotional Preoccupation (CEP) (temptation), and Cognitive Behavioral Control (CBC) (restraint). Additionally, drinking outcomes were examined as a function of the two-way interactions between CEP and perceived descriptive norms and CBC and perceived descriptive norms. Results indicated that CEP and perceived descriptive norms were associated with drinking outcomes. CBC was not associated with drinking outcomes. Additionally, perceived descriptive norms moderated the association between CEP and drinks per week and CEP and alcohol-related problems. There was a positive association between CEP and drinks per week and CEP and alcohol-related problems, especially for those higher on perceived descriptive norms. College students who are very tempted to drink may drink more heavily and experience alcohol-related problems more frequently if they have greater perceptions that the typical student at their university/college drinks a lot.

Keywords

college; drinking; alcohol-related problems; temptation; restraint; perceived descriptive norms

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Contributors

Author 1 conducted the literature search and summary of previous research studies. Authors 1 and 2 developed the study design, statistical analysis, and development of all drafts of the manuscript, including the final draft.

Conflict of Interest

Both authors have declared no conflict of interest.

I. Introduction

1.1 College Drinking

College drinking continues to be prevalent and problematic. The 2010 *Monitoring the Future* report (Johnston, O'Malley, Bachman, & Schulenberg, 2011) indicates that 65% of full-time college students reported drinking in the previous 30 days. Additionally, the report indicates that approximately one in eight full-time college students (13%) reported having 10 or more drinks in a row at least once in the prior two weeks, and one in twenty (5%) reported 15 or more drinks in a row in the previous two weeks. Heavy drinking among college students has been associated with a number of problems, including morbidity and mortality (Hingson, Zha, & Weitzman, 2009), the development of an alcohol use disorders (Knight et al., 2002), academic problems (Wechsler, Lee, Kuo, & Lee, 2000), legal problems (Wechsler et al., 2002; Hingson, Heeren, Zakos, Kopstein, & Wechsler, 2002), risky sexual behavior and sexual assault (Goldstein, Barnett, Pedlow, & Murphy, 2007; Hingson et al., 2009), drinking and driving (Hingson et al., 2009), and unintentional, non-traffic injuries and physical assaults (Hingson et al., 2009). Although personalized normative feedback interventions have been found to be effective in reducing heavy drinking and alcohol-related problems among college students (Cronce & Larimer, 2011), problematic drinking continues to be prevalent. As such, it is imperative that we continue to examine the various factors related to intra- and inter-personal determinants of drinking (Marlatt & Donovan, 2005). Two such intrapersonal determinants of drinking behavior that have received relatively little attention with regard to college drinking are temptation and restraint.

1.2 Temptation and Restraint

Temptation and restraint have long been associated with problematic drinking. Temptation refers to a preoccupation with controlling alcohol use, whereas restraint refers to behaviors or self-imposed rules designed to avoid or reduce alcohol consumption (Collins & Lapp, 1991; Collins, 1993). Bensley (1989) characterized temptation and restraint as involving cycles of both control of alcohol consumption and lapses in controlled drinking, leading to heavy episodes of drinking. These extremes create a response conflict and disrupt the balance between temptations to drink and restrained drinking. Collins et al. (1991) and Marlatt (1985) discussed this in terms of the abstinence violation effect and the limit violation effect, which suggest that when an individual either chooses to abstain from or limit their intake of alcohol, but experiences a lapse, they blame themselves and experience negative affect related to this. In order to ameliorate their negative affect, they drink more. As a result, temptation and restraint are associated with heavier alcohol use and related problems. Indeed, a number of studies have found a significant, positive associations between temptation and restraint, drinking behaviors, and drinking-related problems in community, outpatient, and college samples (Bensley, Kuna, & Steele, 1990; Collins et al., 1991; Collins, 1993; Collins, Gollnisch, & Izzo, 1996; Collins, Koutsky, & Izzo, 2000; Collins, Koutsky, Morsheimer, & MacLean, 2001; Connor, Gudgeon, Young, & Saunders, 2004; Curry, Southwick, & Steele, 1987; Jones, Cole, Goudie, & Field, 2012; Lyvers, Hasking, Hani, Rhodes, & Trew, 2010; MacKillop, Lisman, & Weinstein, 2006; Muraven, Collins, & Nienhaus, 2002; Muraven, Collins, Morsheimer, & Shiffman, 2005a; Muraven, Collins, Morsheimer, & Shiffman, 2005b; Stewart & Chambers, 2000; Williams & Ricciardelli, 1999).

Recent research suggests that temptation to drink may be more consistently associated with alcohol consumption and alcohol-related problems than the regulation and control of alcohol (i.e., restraint). Collins and Lapp (1992) developed the Temptation and Restraint Inventory as a way to more comprehensively assess for both the cognitive and behavioral factors. Among

a community sample, the authors found two higher-order factors, the Cognitive Emotional Preoccupation (CEP) subscale, which measures temptation to drink, and the Cognitive Behavioral Control (CBC) subscale, which measures alcohol regulation (i.e., restraint). The two subscales were found to be moderately positively correlated with one another. Additionally, the authors found that CEP was positively associated with typical weekly drinking and alcohol-related problems, and that CBC was negatively associated with typical weekly drinking only. These results were replicated in a more recent study examining the utility and validity of the TRI in a community sample of moderate to heavy drinkers (Collins et al., 2000). However, a recent study examining the psychometric properties of the TRI in the college population found that both the CEP and CBC positively predicted scores on the Alcohol Use Disorder Identification Test (AUDIT) (MacKillop et al., 2006). Lyvers et al. (2010) also found that although there was a positive association between CEP and total AUDIT scores in a community sample of young adults, there was not an association between CBC and total AUDIT scores. However, when looking at the subscales of the AUDIT, CBC was positively associated only with the alcohol-related problems subscale. These conflicting findings may be a function of the AUDIT, in that it measures both alcohol use and alcohol-related consequences. Finally, studies that have examined the effect of temptation and restraint on drinking outcomes in an alcohol dependent sample (Connor et al., 2004), a community sample of moderate to heavy drinkers (Collins et al., 1996), and a community sample of high school students (Williams et al., 1999) all concluded that while CEP was associated with drinking outcomes, CBC was not. Taken together, these results indicate that CEP, or temptation, may be more consistent in determining alcohol outcomes than CBC, or behavioral regulation (i.e., restraint).

It is unclear under what conditions temptation and restraint would affect drinking and alcohol-related problems among college students. Research suggests that social norms are among the strongest influences on college drinking (Neighbors, Lee, Lewis, Fossos, & Larimer, 2007). Foremost among these factors are perceptions that drinking is prevalent among one's peers, also known as perceived descriptive norms.

1.3 Perceived Descriptive Norms

Perceived descriptive norms refer to the perception of how others' engage in a particular behavior (Cialdini, Reno, & Kallgren, 1990). With regard to alcohol consumption, perceived descriptive norms refer to the perception of how much or how frequently others' drink. Considerable research indicates that college students tend to overestimate the drinking quantity and frequency of other college students, which is associated with heavy drinking and alcohol-related problems (Borsari & Carey, 2003; Larimer, Turner, Mallett, & Geisner, 2004; Lewis & Neighbors, 2004).

Research suggests that the degree of overestimation varies by the specificity of the normative referent, such that perceived descriptive norms for more specific referent groups, based on gender, being a student at that particular university, ethnicity, and fraternity/sorority status have been found to be associated with drinking behaviors and alcohol-related problems (Larimer et al., 2009; Larimer et al., 2011; Lewis et al., 2004; Lewis & Neighbors, 2007; Lewis, Neighbors, Oster-Aaland, Kirkeby, & Larimer, 2007; Neighbors et al., 2010).

1.4 The current research

The present research was designed to extend previous research examining temptation and restraint. Given that temptation and restraint are strongly associated with drinking and alcohol-related problems, and given that social norms are one of the strongest predictors of drinking in college students, examining the association among these constructs may be fruitful. We expected that temptation and restraint would both be positively associated with

drinking and alcohol-related problems. We further expected that these associations would be moderated by perceived descriptive norms, such that they would be more strongly associated with drinking outcomes among those who perceived drinking to be more prevalent among typical students attending the same university.

2. Methods

2.1 Participants

Ten thousand students at a large, public, culturally diverse, southern university were invited to complete an online survey to document current drinking norms and drinking related attitudes. Of those invited to participate, 1,095 students completed the online survey. Half of this sample was randomized to answer items related to temptation and restraint, of which 519 students completed these items. The mean age was 21, and slightly more than half the sample was composed of females (56.3%). The racial/ethnic breakdown was 33.2% Caucasian, 31.3% Asian, 23.7% Hispanic, 10% Black/African-American, 0.8% Native Hawaiian/Pacific Islander, 0.5% Native American, 6.4% multi-ethnic, and 8.1% self-identified as "Other". The majority of students were full-time (81.4%) and not members of a fraternity or sorority (86.1%).

2.2 Procedures

In the Spring semester of 2012, participants were invited to complete an online survey to document current drinking norms and drinking related attitudes. The survey took approximately 50 minutes to complete and participants were compensated \$25 upon completion. This study was approved by the Committee for the Protection of Human Subjects at the University of Houston.

2.3 Measures

2.3.1 Drinks per week—The *Daily Drinking Questionnaire* (DDQ; Collins, Parks, & Marlatt, 1985; Kivlahan, Marlatt, Fromme, Coppel, & Williams, 1990) was used to assess drinks per week. Participants were asked to report the average number of standard drinks they consumed on every day of a normal Monday to Sunday week within the last one month. Scores represent the sum of the number of alcoholic beverages that were consumed over the course of the week.

2.3.2 Alcohol-related problems—The *Rutgers Alcohol Problem Index* (RAPI; White & Labouvie, 1989) is a 25-item scale assessing alcohol-related negative consequences in the last 30 days (one month). Responses ranged from 0-Never to 4-10 times or more. Items were rated based on how many times each problem occurred while drinking. Examples of items include "Went to work or school high or drunk" and "Felt that you had a problem with alcohol". Scores represent the mean of all 25 items, representing the average frequency of experiencing alcohol-related problems. Cronbach α for the RAPI was .91.

2.3.3 Perceived descriptive norms—Perceived descriptive norms were measured by a modified version of the Drinking Norms Rating Form (DNRF; Baer, Stacy, & Larimer, 1991). Participants were asked to assess the average number of standard drinks consumed on every day of a normal Monday to Sunday week within the last one month by the typical student at the University of Houston. Scores represent the sum of the number of alcoholic beverages that participants estimated were consumed by the typical student at the University of Houston over the course of the average week in the past month.

2.3.4 Temptation/Restraint—Temptation and restraint were measured by the *Temptation Restraint Inventory* (TRI; Collins & Lapp, 1992). The TRI is a 15-item measure assessing temptation and restraint. Each item is rated on a 9-point Likert scale, ranging from 1-Never to 9-Always. The scale is composed of two higher-order factors, the Cognitive Emotional Preoccupation (CEP; temptation to drink; “Is it hard to distract yourself from thinking about drinking?”) subscale (Cronbach $\alpha = .86$) and the Cognitive Behavioral Control (CBC; restriction of alcohol consumption; “How often do you attempt to cut down the amount you drink?”) subscale (Cronbach $\alpha = .82$).

3. Results

3.1 Descriptive Results

Table 1 presents correlations, means, standard deviations, minimums, and maximums for CEP, CBC, perceived descriptive norms, drinks per week, and alcohol-related problems. CEP and CBC were significantly positively correlated with each other. Additionally, CEP was significantly positively correlated with perceived descriptive norms, drinks per week, and alcohol-related problems. CBC was significantly positively associated with both drinks per week and alcohol-related problems, but not perceived descriptive norms. Perceived descriptive norms were significantly positively associated with both drinks per week and alcohol-related problems. Finally, drinks per week and alcohol-related problems were significantly positively correlated with each other.

3.2 Primary Analyses

To test our hypothesis that perceived descriptive norms would moderate the association between temptation and restraint and drinks per week, we conducted multiple hierarchical regressions (Table 2). First, all variables were mean-centered. Next, we examined drinks per week as a function of sex, CEP, CBC, and perceived descriptive norms at Step 1. Results indicated that sex, CEP and perceived descriptive norms were uniquely associated with drinks per week, but CBC was not significantly associated with drinks per week. In Step 2, we added the two-way product terms of perceived descriptive norms and CEP and perceived descriptive norms and CBC. Results indicated that there was a significant two-way interaction between perceived descriptive norms and CEP, but not perceived descriptive norms and CBC.

These results were partially consistent with our hypothesis that the association between temptation and restraint and drinks per week was stronger for those with higher perceived descriptive norms. Interactions were graphed using parameters from the regression equation as described in Cohen, Cohen, West, & Aiken (2003). Values in Figure 1 represent the number of drinks that would be predicted for a person who scored one standard deviation above (high) and below (low) the mean of perceived descriptive norms and one standard deviation above (high) and below (low) the mean on CEP. Figure 1 reveals that CEP was associated with increased drinks per week, and that this relationship was stronger among individuals with higher perceived descriptive norms than individuals with lower perceived descriptive norms. Tests of simple slopes (indicated in the figure) revealed that the association between CEP and drinks per week was significant at both the low and high level of perceived descriptive norms, but more so for high perceived descriptive norms.

To test our hypothesis that perceived descriptive norms would moderate the association between temptation and restraint and alcohol-related problems, we again conducted multiple hierarchical regressions. First, we examined alcohol-related problems as a function of sex, drinks per week, CEP, CBC, and perceived descriptive norms at Step 1. Results again indicated that drinks per week and CEP were uniquely associated with alcohol-related

problems, but sex, perceived descriptive norms, and CBC were not significantly associated with alcohol-related problems. In Step 2, we added the two-way product terms of perceived descriptive norms and CEP and perceived descriptive norms and CBC. Results again indicated that there was a significant two-way interaction between perceived descriptive norms and CEP, but not perceived descriptive norms and CBC.

These results were again partially consistent with our hypothesis that the association between temptation and restraint and alcohol-related problems was stronger for those with higher perceived descriptive norms. Values in Figure 2 represent the frequency of alcohol-related problems that would be predicted for a person who scored one standard deviation above (high) and below (low) the mean of perceived descriptive norms and one standard deviation above (high) and below (low) the mean on CEP. Figure 2 reveals that CEP was associated with increased alcohol-related problems, and that this relationship was stronger among individuals with higher perceived descriptive norms than individuals with lower perceived descriptive norms. Tests of simple slopes (indicated in the figure) again revealed that the association between CEP and alcohol-related problems was significant at both the low and high level of perceived descriptive norms, but more so for high perceived descriptive norms.

3.3 Additional Analysis

We explored whether similar effects were observed for perceived injunctive norms, which was significantly correlated with perceived descriptive norms ($r=.57$). We conducted the same set of analyses with perceived injunctive norms as we did with perceived descriptive norms. Results indicated a similar pattern with those reported for descriptive norms. We subsequently included both descriptive and injunctive norms in the same analyses. In those analyses the interactions between CEP and descriptive norms remained significant but no interactions were significant with injunctive norms. Thus, the pattern of results appears to be similar but stronger for descriptive norms.

4. Discussion

The purpose of this study was to examine whether perceived descriptive norms moderated the relationship between temptation and restraint and drinking and alcohol-related problems. The results indicated that CEP and CBC were both moderately associated with each other, which has been consistent with previous findings (Collins & Lapp, 1992; Collins et al., 2000; Lyvers et al., 2010). Moreover, CEP positively predicted drinking and alcohol-related problems, which was also consistent with previous research findings (Collins & Lapp, 1992; Collins et al., 2000; Connor et al., 2004; MacKillop et al., 2006). While both CEP and CBC were both correlated with drinking outcomes, only CEP was uniquely associated with drinking outcomes. In addition, only CEP was associated with perceived descriptive norms. These findings are in keeping with the literature that consistently suggests that CEP is associated with drinking behaviors and alcohol-related problems (Collins & Lapp, 1992; Collins et al., 1996; Connor et al., 2004; Lyvers et al., 2010; MacKillop et al., 2006; Williams et al., 1999). As expected, perceived descriptive norms did moderate the association between CEP and both drinks per week and alcohol-related problems. However, perceived descriptive norms did not moderate the association between CBC and either drinking outcome.

Prior research indicates that greater temptation to drink is associated with an increase in alcohol quantity and alcohol-related problems (Collins et al., 1991; Collins, 1993; Collins et al., 1996; Collins et al., 2000; Connor et al., 2004; MacKillop et al., 2006; Williams et al., 1999). The primary finding in the present research is that college students who are higher in temptation drink more and experience more alcohol-related problems when they perceive

drinking to be more prevalent among their peers. While the present research cannot distinguish causal directions, there are at least two plausible explanations for these findings, both of which may be operating. To the extent that perceived descriptive norms serve as a subjective measure of peer influence, they may augment temptations to drink. If one is struggling against temptations to drink, it may be much more difficult to resist in an environment full of drinking peers. Alternatively, perceiving peers to be drinking more may facilitate yielding to temptation by offering justification (i.e., everyone else is drinking) or by making one's own drinking seem to be more "normal".

In contrast to temptation, CBC was not uniquely related to drinking or to alcohol-related problems, nor was it moderated by perceived descriptive norms. This is consistent with certain research that suggests that CEP is uniquely associated with drinking outcomes and CBC is not (Collins & Lapp, 1992; Collins et al., 1996; Connor et al., 2004; Lyvers et al., 2010; MacKillop et al., 2006; Williams et al., 1999). This may be partially due to the relative differences between behavioral regulation, temptation, and perceptions of others' behaviors. Both temptation and perceived descriptive norms, which are cognitive constructs, may be more malleable and amenable to revision. On the other hand, attempting to regulate one's behavior involves more objective and concrete actions. Attempting to cut down one's drinking requires that a decision has been made to take some action, which is accompanied by some degree of commitment. Regardless of the success of attempts to regulate consumption, decisions to do so may be less resistant to social influences, when compared to temptations, which don't necessarily require concrete action.

Interventions aimed at reducing overestimations of drinking norms among heavy-drinking college students by providing accurate information contrasting perceived and actual descriptive drinking norms with participant's own drinking behavior have been found to be effective (Carey, Scott-Shelson, Carey, & DeMartini, 2007; Larimer & Crounce, 2007; Walters & Neighbors, 2005). Indeed, reductions in perceived descriptive norms have been shown to mediate the efficacy of these interventions (Borsari & Carey, 2000; LaBrie, Hummer, Neighbors, & Pedersen, 2008; Neighbors, Larimer, & Lewis, 2004; Wood, Capone, Laforge, Erickson, & Brand, 2007). Interventions may incorporate feedback regarding preoccupation with alcohol, particularly for college students who report greater temptation to drink.

4.1 Limitations and Future Directions

First, the 10% response rate to our survey is a limitation. Additionally, the cross-sectional design of the study limits our ability to make causal inferences. While the results are consistent with the suggestion that perceived descriptive norms and temptation and restraint precede drinking outcomes, some research suggests that there are reciprocal effects of norms on drinking (Neighbors, Dillard, Lewis, Bergstrom, & Neil, 2006). Similarly, one might expect heavier drinking to precede temptation and efforts to restrain one's drinking. In addition, perceiving higher drinking norms may increase the difficulty to resist temptation. Future longitudinal research would help us better understand the causal pathways among these variables. Moreover, the sample came from a large and diverse campus which has somewhat lower drinking norms than less diverse campuses. It would be helpful to see if the same findings replicate on less diverse and/or heavier drinking campuses. Related to this, a number of participants did not endorse any of the CBC or CEP items (24% and 22% percent, respectively). This may be due to the fact that this was a sample that had somewhat lower drinking norms than those drawn from other college campuses. Again, it would be helpful to see if the same findings replicate on heavier drinking campuses.

It is also worth considering that temptation and restraint and drinking are assessed rather globally. Future research using ecological momentary assessment could examine the

influence of perceived descriptive norms on specific instances of temptation and efforts to restrain drinking. Similarly, it would be interesting to examine perceived descriptive norms operationalized at varying levels of specificity of normative reference groups. Presumably, temptation would be harder to resist when one perceives drinking to be more prevalent among one's own friends, rather than students in general. Furthermore, it would be interesting to consider whether it might be more difficult to resist temptation and/or restrain from drinking more in the presence of certain friends (e.g., "drinking buddies") than others.

This research extends previous work on temptation and restraint, generally finding temptation to be more strongly associated with drinking outcomes than attempts to regulate drinking behavior. Furthermore, this research provides preliminary support for the notion that temptation is more difficult to resist in the face of perceived descriptive norms.

Acknowledgments

The authors wish to thank Mr. Zach Traylor for his assistance with proofreading and editing this text.

Role of Funding Sources

Funding for this study was provided by the NIAAA Grant R01AA014576. NIAAA had no role in the study design, collection, analysis or interpretation of the data, writing the manuscript, or the decision to submit the paper for publication.

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Highlights

- Temptation is associated with problematic drinking among college students
- Perceived norms moderate the association between temptation and problem drinking
- College students may give in to temptation if they believe drinking is prevalent

Figure 1.

High CEP was associated with greater drinks per week, and this relationship was stronger among those with high perceived descriptive norms than low perceived descriptive norms

Figure 2.

High CEP was associated with greater alcohol-related problems, and this relationship was stronger among those with high perceived descriptive norms than low perceived descriptive norms

Table 1

Correlations, means, standard deviations, minimums, and maximums for Cognitive Emotional Preoccupation, Cognitive Behavioral Control, perceived descriptive norms, drinks per week, and alcohol-related problems.

Variable	1.	2.	3.	4.	5.
1. CEP	--				
2. CBC	.53***	--			
3. Norms	.09*	.05	--		
4. DPW	.45***	.18***	.26***	--	
5. Problems	.50***	.28***	.16***	.51***	--
Mean	1.61	1.87	14.17	2.93	1.64
SD	1.03	1.46	10.96	6.07	4.07
Min	1.00	1.00	0.00	0.00	0.00
Max	6.67	9.00	81.00	55.00	37.00

CEP-Cognitive Emotional Preoccupation. CBC-Cognitive Behavioral Control.

Norms-perceived descriptive norms. DPW-drinks per week. Problems- alcohol-related problems

*
p<.05.

p<.001.

Table 2

Regressions for drinks per week and alcohol-related problems

Outcome	Predictor	B	S.E.(B)	β	R ²
DPW	Sex	-1.47*	.47	-.12	.27
	CEP	2.75***	.26	.47	
	CBC	-.28	.19	-.07	
	Norms	.12***	.02	.22	
	CEP*Norms	.09***	.02	.23	.31
	CBC*Norms	-.02	.02	-.05	
Problems	Sex	-.13	.30	-.02	.35
	DPW	.23***	.03	.34	
	CEP	1.26***	.18	.32	
	CBC	.14	.12	.05	
	Norms	.02	.01	.05	
	CEP*Norms	.04*	.01	.15	.36
	CBC*Norms	-.02	.01	-.09	

CEP-Cognitive Emotional Preoccupation. CBC-Cognitive Behavioral Control.

Norms-perceived descriptive norms. DPW-drinks per week. Problems- alcohol-related problems

*
p<.01.***
p<.001.