Psychological reactance and effects of social norms messages among binge drinking college students

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Abstract

Social norms campaigns have been a popular means to attempt to combat college student alcohol abuse. The strategy of social norms campaigns to correct misperceived, descriptive norms, however, has been controversial in reducing college student (binge) drinking. This study asserts that social norms marketing messages would have small effects on changing binge drinking college student’s drinking behavior due to the mediating variable of psychological reactance. Reactance theory predicts that when students binge drinkers perceive a restraint to their personal freedom they are likely to deny the legitimacy of social norms messages calling for behavior change. The findings show that the mediating psychological reactance variable is directly related to attitude and behavioral intentions respectively, with a stronger direct effect upon behavioral intentions.
Excessive alcohol consumption by college students has been a significant national problem (Rimal & Real, 2005; Wechsler, Molnar, Davenport, & Baer, 1999), which is commonly associated with a number of negative outcomes, including study disruption, vandalism, high-risk sexual behavior, increasing rates of driving under the influence, unintentional injuries and deaths (Hingson, Heeren, Winter, & Wechsler, 2005) and a host of other social, psychological, and physiological problems (Castillo, Davenport, Dowdall, Moeykens, & Wechsler, 1994; Perkins, 2002b; Prevention, 1997; Wechsler, Kelley, Weitzman, SanGiovanni, & Seibring, 2000; Wechsler et al., 2003). College administrators across the country report widespread prevention practices and that they engage in a wide variety of efforts designed to prevent binge drinking (e.g., Brief Alcohol Screening and Intervention for College Students (BASIC) and use of policy control to limit access to alcohol and allocation of alcohol-free dormitories) (Wechsler, Kelley, Weitzman, SanGiovanni, & Seibring, 2000). In spite of numerous prevention programs and policy initiatives directed at binge drinking in American colleges, evidence indicates that excessive drinking continues to be a substantial problem on college campuses nationwide (Wechsler & Kuo, 2000). More than 80% of college students drink alcohol, and approximately 21% of college students report being frequent binge drinkers while another 44% nationally report occasional binge drinking (Wechsler, Dowdall, Maenner, Gledhill-Hoyt, & Hang, 1998). Continuous binge drinking prevention initiatives such as alcohol education (e.g., BASIC and online personalized alcohol education for incoming freshmen), prohibitions on alcohol (e.g., banning on drinking games, no kegs in the dorms and Greek houses, no sales of alcohol at the home games), restrictions on alcohol advertising (e.g., no ads at home sports events and no ads for off-campus bars/clubs) and institutional investments in prevention (e.g., substance-abuse administrator and task force) were not effective in curbing
binge drinking (Larimer & Cronce, 2002; Wechsler, Kelley, Weitzman, SanGiovanni, & Seibring, 2000).

Social Norms Campaign

Social norms campaigns have been a popular means to attempt to combat college student alcohol abuse since Perkins & Berkowitz (1986) introduced the idea that students tend to harbor exaggerated misperceptions about their peers’ drinking behavior. Specifically, nondrinkers and moderate drinkers falsely assume that ordinary college students drink more than they actually do (e.g., pluralistic ignorance) and heavy drinkers believe that most students drink as much as they drink (e.g., false consensus) (Thombs, Dotterer, Olds, Sharp, & Giovannone, 2004). Social norms campaigns have concentrated on changing college students’ misperceptions about the drinking practices of their peers. This approach is based on the a series of studies that indicate alcohol consumption by college students is strongly influenced by how much a student thinks close friends drink (Wechsler et al., 2003). Generally, college students overestimate their peers alcohol consumption, which in turn causes pressure to drink more because students internalize the false norm. The greater the overestimation by students, the more likely they are to misconstrue their binge drinking patterns as being normative. This overestimation, in turn, provide college students with an excuse to drink more (Wechsler & Kuo, 2000).

The strategy of social norms campaigns to correct misperceived, descriptive norms, however, has not been successful as the theory expected in reducing college student (binge) drinking. In the first national evaluation of social norms feedback campaigns, comparing colleges that employed social norms marketing programs and those that did not, Wechsler et al. (2003) concluded that no decrease has been detected in alcohol consumption in terms of seven measures (e.g., drinking in the past year, drinking in the past month, heavy episodic drinking,
drinking on three or more occasions in the past 30 days etc.). In an effort to explain the ineffectiveness of social norms campaigns to reduce alcohol consumption, Rimal & Real (2005) found that descriptive norms (e.g., most students have five or fewer drinks when they party) only explained roughly six percent of the variance in the intention to consume alcohol, and have little interaction with key attitudinal variables that explain almost half variance of behavioral intention to consume alcohol. Their theory of normative social behavior has roots in the theory of reasoned action (Ajzen, 1988). Rimal & Real’s research, however, did not indicate potential mediating variable(s) between descriptive norms and attitude (or behavioral intention) that might explain the inefficacy of delivering correct descriptive norms to curb college students’ binge drinking behavior.

The theory of reasoned action argues that attitudes are important because of their presumed association with related behavioral intentions or behaviors (Ajzen & Fishbein, 1980). A college student’s intention, or actual alcohol consumption is for the most part determined by the interaction of the attitudinal variables such as perceptions of presumed benefits (e.g., mood enhancement, stress reduction, increased affective expression, and greater social interaction) as well as the side effects (e.g., drinking and driving, making people violent, accidents/injuries, hurting someone, and headache/hangover) of alcohol consumption (Quintero, Young, Mier, & Jenks, 2005; Rimal & Real, 2005). If social norms campaigns have not been effective in reducing (binge) drinking among college students, it can be argued that exposure to the “descriptive norms messages” (or the overestimation of alcohol use among one’s peer group) have not been successful in influencing the beliefs and attitudes mentioned above. Few studies, however, have generated information to explain why social norms interventions have been falling short of their intended goals from a proper theoretical perspective. Since attitudes can be associated with
behaviors (e.g., lower binge drinking rate), and if campaign exposure is indeed an antecedent to attitudinal and behavioral changes, it is logical to explore the missing link between exposure to social norms campaign messages and attitudinal changes, as well as ensuing intentional or behavioral changes. This is particularly important as most media effect theories are ultimately concerned with demonstrating impacts on behavioral outcomes. If we are able to understand the cause of the weak association between “descriptive norms messages” and attitudinal variables in the persuasion process, it might suggest strategies for improving future social norms campaigns.

Reactance as a Mediator

Public health campaigns frequently fail to produce the desired effect (Foxcraft, Lister-Sharp, & Lowe, 1997), especially alcohol-related campaigns to college students (Dillard & Shen, 2005; Evans, Wasserman, Bertolotti, & Martino, 2002). Some research attributes the unsuccessful effects of social norms campaigns to lower levels of perceived campaign credibility and lack of understanding of the purpose of the campaign (Thombs, Dotterer, Olds, Sharp, & Giovannone, 2004). Another possible explanation is the comparatively low perceived susceptibility of expected dangers by the college population in general. The level of perceived susceptibility is a strong contributor to the understanding of the effectiveness of preventive health campaign messages (e.g., sober drinking) (Janz & Becker, 1984). However, the highly prevalent optimistic bias against expected dangers of binge drinking and exaggerated benefits of social drinking have continued to lower the perceived susceptibility to the negative outcomes among college students.

Above all, the theory of psychological reactance (Brehm, 1966) provides another clue to understand the limited effects of health communication campaigns like social norms one. Reactance is “the motivational state that is hypothesized to occur when a freedom is eliminated
or threatened with elimination” (Brehm & Brehm, 1981, p. 37). More specifically under the frame of theory of reasoned action, Dillard & Shen (2005) defined reactance as “a state that mediates the effects of threat to freedom on various outcomes such as attitude and behavior (p. 148).” Psychological reactance theory provides a useful guideline how to understand college students’ negative reactions to the anti-binge drinking campaign because the theory was formulated to address basic human needs (especially strong among adolescents and early adulthood) for autonomy and self-determination (Miller, Burgoon, Grandpre, & Alvaro, 2006).

The social norms campaign model proposes that if we give an average college student factual information on average alcohol consumption, then college students are more likely to change their behavior to approximate the norm. The proponents of social norms campaigns believe that the biased perception of drinking behavior is an important risk factor instigating alcohol misuse, especially for college students (Perkins & Craig, 2006). Reactance theory, on the contrary, predicts that when people perceive a restraint to their personal freedom (e.g., if college binge drinking students perceive that they are supposed to drink in moderation to follow the social norm), they are likely to deny the legitimacy of social norms messages calling for behavior change and begin to assert personal freedom to maintain their autonomy (Wolburg, Kendrick, & Cressy, 2005). The desire of recovering personal autonomy and freedom would be high, especially when the restraining messages concern important behaviors for the individual (Brehm, 1966). Furthermore, the needs to reestablishing autonomy and independence have been found to have a particularly strong and compelling influence on adolescents and early adulthood (Heilman & Toffler, 1976). As noted above, we may extend our argument that the magnitude of reactance is greater among binge drinking students than moderate drinkers.
The case of high level of reactance is especially true if they place low credibility on the information source (Haines, 1996). Generally, college students put low source credibility against college health administrators, especially when the perceived communication is one-way and the delivered message is restrictive. It appears that comparatively low source credibility tends to increase psychological reactance, or the tendency of binge drinking students to disregard social norms messages while they attribute many positive benefits on drinking behaviors (e.g., mood enhancement, stress reduction and better social interaction). Research supporting the appearance of psychological reactance has demonstrated a condition producing the opposite effect of the desired known as the boomerang effect (Worchel & Brehm, 1970).

The theoretical basis for the relationship between a fear appeal campaign message and psychological reactance has already been well established (Miller, Burgoon, Grandpre, & Alvaro, 2006; Witte, 1992). Dillard & Shen (2005) reported that there is direct positive relationship between fear appeal and message rejection outcomes (e.g., defensive avoidance and reactance). However, there are few empirical studies supporting the relationship between exposure to social norms messages and resultant psychological reactance. When it applies to addressing the exaggerated norms of college drinking, social norms campaigns may be perceived as another one of those politically correct campaigns that gives college students something to rebel against. Worse still, campaign administrators may not be seen as credible and students may drink even more to confirm their independence and autonomy.

Explained above, reactance may serve a mediating role between exposure to social norms messages and attitudinal (or intentional) change. It is possible, therefore, that a campus alcohol prevention campaign could be the precursor to the activation of reactance, or a boomerang, which may lead to maintaining or increasing drinking (Campo & Cameron, 2006). If students,
for example, doubt or are not favorable to the normative statistics provided by administrators, they may be more likely to enter into a reactance state and try to regain control of environment by not complying with the recommended messages (i.e., maintain normal drinking behavior or drink more). Therefore, psychological reactance could explain the inefficacy of social norms campaigns to change binge drinking students’ attitudes (or intentions) regarding alcohol consumption. The positioning of reactance between the freedom threatening message of social norms (e.g., most students have five or fewer drinks when they party) and various persuasive outcomes like attitudinal (or intentional) changes may suggest strategies for how to construct social norms marketing to prevent binge drinking among college students.

Figure 1. Initial model for the reactance process

| Campaign Exposure (Social Norms Message) | Psychological Reactance | Attitude | Intention |

Reactance has a tendency to increase as the amount of behavioral freedom restricted increases. The level of reactance, in most cases, is likely to be intensified as the attractiveness of the forbidden behavior is heightened (Brehm & Brehm, 1981; Fitzsimons & Lehmann, 2004). Hence, if we believe that limiting individual freedom and subsequent psychological reactance is interrelated, there should be a positive correlation between exposure to descriptive social norms messages (e.g., Most students have five or fewer bottles of drink when they party) and the activation of psychological reactance.

**Audience Segmentation**

Audience segmentation helps effectively measure the impacts of health campaign messages (Atkin & Freimuth, 2001). If the intensity of reactance is positively related with the
emotion of restricted freedom and psychological reactance proneness, binge drinkers are likely to experience higher emotional reactions to the social norms messages than those by moderate drinkers. To binge drinking college students, social norms message (e.g., most students have five or fewer drinks when they party) can lead to comparatively more intense emotional reactions than moderate drinkers do. Binge drinking students are more likely to be too preoccupied with the presumed benefits of binge drinking behaviors to think rationally about social norms ideas of avoiding the binge drinking. So, the effects of social norms messages on the psychological reactance were evaluated from two subgroups of binge and moderate drinkers, respectively.

Two Antecedents of Reactance

This study hypothesizes that exposure to social norms campaign messages will generate a certain level of reactance among college students that will encourage them to assert their independence, which will in turn engender negative beliefs and attitudes toward the campaign messages. Prior research indicates that the level of reactance generated by a certain message is affected by the trait of reactance proneness (Dillard & Shen, 2005; Donnell, Thomas, & Buboltz, 2001) and the amount of freedom threatened (Fitzsimons & Lehmann, 2004). Hence, if college students with high levels of reactance proneness experience certain amounts of perceived restrictions on their freedom they should be more likely to feel reactance.

 Trait of psychological reactance proneness and the amount of freedom threatened

Reactance theory may be of special significance to the college years, in which the sense of independence and individuality dominate behavioral choices (Hersey et al., 2005). Researchers initially viewed psychological reactance as a situational specific variable. However, other researchers have considered that the amount of reactance may in part be determined by a specific individual trait (Hong & Page, 1989). Subsequently, a few scholars began to develop
scales to measure an individual’s propensity to experience reactance (Hong & Page, 1989; Merz, 1983), and further refinements have been conducted through further factor analytic validation (Donnell, Thomas, & Buboltz, 2001; Hong & Faedda, 1996). In line with the general understanding that a college student with high reactance proneness should be more likely to express high reactance in response to the social norms messages, this research hypothesize that:

**H1: The magnitude of psychological reactance is directly correlated with personal psychological reactance proneness, especially among binge drinking college students.**

Brehm (1966) posited that psychological reactance is a motivational state directed toward the original unrestricted conditions to recover the constrained freedom. The amount of psychological reactance, in many circumstances, is positively correlated with the amount of freedom threatened. The feeling of freedom threatened in turn is heightened when the constrained behavior is attractive, when the restricted freedom is perceived personally by the subject, when a person has hostile attitudes toward the source of the restriction and the recommendations are unwanted (Fitzsimons & Lehmann, 2004). Some proponents of social norms campaign argue that the positive trait of social norms messages seldom intrigue college student’s innate desire for autonomy and self-determination. However, there have been few researches to see whether social norms messages are indifferent to activating psychological reactance among college students. Overall, this study hypothesize that the magnitude of freedom restricted is directly correlated with the magnitude of psychological reactance.

**H2: The magnitude of psychological reactance is directly correlated with magnitude of freedom threatened, especially among binge drinking college students.**

This study asserts that social norms marketing messages would have small effects on changing college students’ binge drinking behavior due to the mediating variable of
psychological reactance. So, this study hypothesize that psychological reactance would exert positive effects on drinking attitude and drinking intention.

**H3:** The psychological reactance generated by social norms messages is positively correlated with attitudes on drinking behavior, especially of binge drinking college students.

**H4:** The psychological reactance generated by social norms messages is positively correlated with a behavioral intention toward drinking behaviors, especially of binge drinking college students.

Figure 2. Revised model for the reactance process

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**Methods**

**Procedures**

Students received emails saying that the researchers wanted to know university students’ health perceptions and practices. Participants were advised that all answers would be kept confidential and the questionnaire would take approximately 10 ~ 15 minutes to complete. Students who wanted to participate clicked the online hyperlink to the online survey website. In the online survey, respondents read a persuasive message of social norms campaign and provided their cognitive and affective responses about their psychological reactance proneness and amount of threat to freedom, as well as their psychological reactance, attitude, and behavioral intention.

**Participants**
All participants were recruited from undergraduate students of a college located in the Northeastern part of U.S.. According to the ’06 Core Alcohol and Drug Survey funded by the U.S. Department of Education, 92.2% of the studied college students consumed alcohol in the past year and 42.3% of them reported frequent binge drinking (more than 3 times of binge drink last two weeks) in the previous two weeks, which is much higher than national average (76.6% and 27.2%, respectively). Furthermore, at the same Core Alcohol and Drug Survey 45.8% of studied college students answered that they experienced peer pressure to drink last 30 days, which is also above the national average of 26.8%.

An email list of undergraduate students enrolled at the college was secured with the help of the college’s Office of Institutional Research & Assessment after approval from the Human Subject Committee. The list of email addresses were generated randomly out of about 6,700 undergraduate students. 1,584 undergraduate students were sent an email and asked to visit the hyperlinked online survey website (www.surveypro.com). Students who decided to answer the survey completed the self-administered survey questionnaire, requiring approximately 15 minutes. The respondents contain a cross-section of majors and school years. Of 1,584 undergraduate students who were contacted, 501 students completed the online survey. Some of the participants received a small monetary reward for participating in the research through random selection.

Out of 501 subjects who participated in the study, 34.3% of them were men. 24.2% of the participants were freshmen, 32.5% were sophomore, 24% were junior, and 19.4% were senior. The grade point average of 64.8% of respondents was between 2.51 through 3.5 out of 4.0. 13.8% were below 2.5 and 21.4% were above 3.5. About 74.1% of respondents lived with roommates or housemates and 92.8% of them were not member of fraternity or sorority. 67.5%
of them lived on-campus and more than 77.6% of them had a first drinking experience before 17 years old. Above all, 64.5% have more than 5 drinks when they party.

Message Creation

Social norms messages were provided through two posters with normative statistics regarding undergraduate students’ attitudes toward drinking. The copy of first poster delivers the main idea of social norms message, such as “82.3% of students thought there was great risk in taking 5 or more drinks in one setting.” The other poster deals with close friends’ opinions toward binge drinking. There is a large difference in whether or not the norm is proximal (e.g., close friends) or distal (e.g., general student body). College students are much better at accurately judging close friends’ drinking behaviors and care more about opinions by their close friends than the campus student body. So, the copy of second poster is about close friends’ ideas toward binge drinking behavior, such as “76.7% of students thought their close friends would disapprove or strongly disapprove of them drinking more than 4 or 5 drinks over the party.” The Core Alcohol and Drug Survey was developed to measure alcohol and other drug usage, attitude, and perceptions among college students funded by U.S. Department of Education. The data in the two posters were attributed to the Core Alcohol and Drug Survey of the studied college (2006) and the specific copies of two posters were developed to accommodate the Core survey outcomes of the studied northeastern college.

Measures

Five key traits (e.g., reactance proneness, threat to freedom, psychological reactance, attitude, and behavioral intention) were measured by developing a multi-item index. The Cronbach alpha was employed as a measure of the reliability of the index.
Hong’s reactance scale was used to measure trait reactance proneness (Dillard & Shen, 2005; Hong & Faedda, 1996). Out of the 12 original items in Hong’s scale, after running factor analysis, six items forming the biggest factors were chosen for the reactance proneness index. Thus, we treated the index of six items as a single measure of trait reactance proneness. The alpha reliability for the social norms index was .72. Sample items from the Hong scale include: “I become frustrated when I am unable to make free and independent decision,” “I become angry when my freedom of choice is restricted,” and “Regulations trigger a sense of resistance to me.”

Perceived threat to freedom was measured by the items used at the Dillard & Shen’s research (2005). The original items showed one dimensionality at the factor analysis. The alpha reliability for the social norms index was .73. The four wordings of four items are “The message threatened my freedom to choose,” “The message tried to make a decision for me,” “The message tried to pressure me,” and “The message tried to influence me.”

Participants’ reactance for the social norms messages was measured by the four items (Dillard & Shen, 2005) and they also showed one dimensionality at the factor analysis. The four items used are “The message makes me irritated,” “The message makes me annoyed,” “This message triggers a sense of resistance,” and “This message induces me to feel doing the opposite.” The alpha reliabilities of the social norms index were both .91.

Participants’ attitudes toward the message advocacy (i.e., “To limit one’s alcohol consumption to five drinks or less is”) were measured by seven, 5-point semantic differential scale questions. The word pairs used were: bad/good, foolish/wise, unfavorable/favorable, negative/positive, undesirable/desirable, unnecessary/necessary, and detrimental/beneficial (Dillard & Shen, 2005). Alpha reliability was .92. Behavioral intention was measured by a single 5-point Likert scale (i.e, very unlikely to very likely) item of the likelihood of drinking four or
more drink in a row within four hours over the next month. Because the purpose of social norms
campaign is to reduce binge drinking rather than casual drinking, the specific copy of behavioral
intention measurement was made by asking a respondent’s intention to drink more than four or
more bottles within four hours.

Analysis

Structural equation modeling, using a Linear Structural Relations (LISREL) program was
employed in order to explore the interdependence or possible reciprocal causation among
constructs of the suggested model. Factor analyses and reliability analyses of index items
revealed a large general factor and high internal consistency reliability for each construct.
Therefore, a single indicator approach for each construct was used and causal patterns among
constructs were emphasized. Since there are not multiple indicators of the latent variables, the
measurement model was not estimated. However, LISREL rather than standard regression
analysis was used to estimate our model because LISREL allows the estimation of reciprocal
causation and measurement errors as well as provides goodness of fit and modification index to
reach the best specification for the suggested model.

The LISREL 8.7 program was used to test the goodness-of-fit of the model and to
estimate the model’s parameters. Of the various available methods of estimating overall model
fit and model parameters, the Maximum Likelihood method was used to find the $\chi^2$ goodness-of-fit
index. Because the power of the $\chi^2$ test increases with sample size, the root mean squared error
of approximation (RMSEA), the adjusted goodness-of-fit index (AGFI), the normed fit index
(NFI), and the comparative fit index (CFI) were also reported.

Results
Extensive social norms researchers have documented pervasive misperceptions about drinking norms on college campuses nationwide (Perkins, 2002a; Perkins & Craig, 2006). Proponents of social norms argue that exaggerated misperceptions contribute significantly to the problem of alcohol misuse on campus. In order to check the presence of exaggerated perceptions of peer alcohol consumption, perceived drinking norms about general college student body and their close friends were asked in combination with respondents’ actual drinking behaviors. To better describe the existence of misperceptions, perceived estimation and actual amount of drinking were cross-tabulated by moderate drinkers and binge drinkers.

Table 1. Perceived drinking norms and actual drinking behaviors by moderate drinkers and binge drinkers.

<table>
<thead>
<tr>
<th></th>
<th>Estimated amount of drinking by typical students</th>
<th>Estimated amount of Drinking by close friends</th>
<th>Actual amount of current drinking behaviors by respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moderate drinkers (N=178)</td>
<td>6.1* (1.8**)</td>
<td>5.9 (2.5)</td>
<td>2.6 (1.2)</td>
</tr>
<tr>
<td>Binge drinkers (N=323)</td>
<td>8.0 (1.7)</td>
<td>8.6 (2.3)</td>
<td>8.0 (2.4)</td>
</tr>
<tr>
<td>Total (N=501)</td>
<td>7.5 (1.9)</td>
<td>7.6 (2.7)</td>
<td>6.1 (3.3)</td>
</tr>
</tbody>
</table>

* The American industry standard bottle (ISB) size of 12 U.S. fl oz (355 ml) was used as a measurement for the amount of drinking and the estimation is based on one overnight party.
** Standard deviation.

Table 1 presents a comparison of the perceived estimation of peer’s drinking and the average alcohol consumption by the college students with the categorization of moderate drinkers and binge drinkers. The findings indicate that there exists a pluralistic ignorance mainly among moderate drinking college students. Moderate drinkers falsely assume that most of their fellow students drink more than they actually do. They also estimated that the general campus student body would consume more alcohol than their close friends, 6.1 and 5.9 bottles respectively. The phenomenon of false consensus of estimating most students drink as much as they do appeared among binge drinking groups. Binge drinkers falsely assumed that college student body as well as their close friends are likely to consume at least as much as they do, which is at least two bottles higher than average college student drinking (one standard bottle
(ISB) has 12 U.S. fl oz (355 ml)). Above all, binge drinkers highly overestimate their close friends’ drinking.

The findings of overestimating drinking norms among respondents induced both by pluralistic ignorance from moderate drinkers and false consensus from binge drinkers confirmed the background arguments of social norms campaign. Having confirmed the existence of a perception gap, however, makes it further attempting to explain the inefficacy of social norms campaign via the mediating effect of psychological reactance variable between campaign exposure and attitudinal changes.

Figure 3. Revised model for the reactance process after exposing “social norm” messages to both binge drinkers (N=323) and moderate drinkers (N=178): Final model with standardized direct effects.

<table>
<thead>
<tr>
<th></th>
<th>Reactance Proneness (V1)</th>
<th>Psychological Reactance (V3)</th>
<th>Attitude (V4)</th>
<th>Intention (V5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reactance Proneness</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Threat to Freedom</td>
<td>0.112*(0.079)</td>
<td></td>
<td>0.122*(0.044)</td>
<td></td>
</tr>
<tr>
<td>Freedom (V2)</td>
<td>0.142*(0.079)</td>
<td>0.158*(0.040)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Effect statistically significant (z statistic > 2).
- The values outside ( ) are standardized causal effects of social norm messages among binge drinkers.
- The values in ( ) are standardized causal effects of social norm messages among moderate drinkers.

The initial structural equation model, represented in Figure 2, generally supported a set of relationships predicting binge drinking attitudes and intentions under the mediating role of psychological reactance for both moderate and binge drinking groups. However, the modification indices from the initial model outcomes suggested the need to add direct paths between behavioral intentions and psychological reactance variables for both moderate and binge drinking subgroups. Also in both subgroups the model fits were improved by deleting paths linking attitude and behavioral intention. The suggestions to the model modifications by SEM
analysis program (LISEREL) were similar to both models for the subgroups of moderate and binge drinkers. Because the modifications were not contrary to the theoretical supports of this study, the paths were revised as suggested. The results of the final model are presented in Figure 3 and Table 2.

Table 2 Standardized causal effects of social norms messages on binge drinkers (N=323) and moderate drinkers (N=178): Standardized effects of exogenous and endogenous variables on endogenous variables.

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Determinant</th>
<th>Direct</th>
<th>Indirect</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Psychological Reactance</td>
<td>Reactance Proneness</td>
<td>0.112*(0.079)</td>
<td>-</td>
<td>0.112*(0.079)</td>
</tr>
<tr>
<td></td>
<td>Threat to Freedom</td>
<td>0.142*(-0.079)</td>
<td>-</td>
<td>0.142*(-0.079)</td>
</tr>
<tr>
<td>Attitude Reactance</td>
<td>Psychological Reactance</td>
<td>0.122*(0.044)</td>
<td>-</td>
<td>0.122*(0.044)</td>
</tr>
<tr>
<td></td>
<td>Reactance Proneness</td>
<td></td>
<td>0.014(0.004)</td>
<td>0.014(0.004)</td>
</tr>
<tr>
<td></td>
<td>Threat to Freedom</td>
<td></td>
<td>0.018(-0.003)</td>
<td>0.018(-0.003)</td>
</tr>
<tr>
<td>Intention</td>
<td>Psychological Reactance</td>
<td>0.158*(0.040)</td>
<td>-</td>
<td>0.158*(0.040)</td>
</tr>
<tr>
<td></td>
<td>Reactance Proneness</td>
<td></td>
<td>0.018(0.003)</td>
<td>0.018(0.003)</td>
</tr>
<tr>
<td></td>
<td>Threat to Freedom</td>
<td></td>
<td>0.023(-0.003)</td>
<td>0.023(-0.003)</td>
</tr>
</tbody>
</table>

* Effect statistically significant (z statistic >2).
( ): The values outside ( ) are standardized causal effects of social norm messages on binge drinkers. The values in ( ) are standardized causal effects of social norm messages on moderate drinkers.

Validation of findings: Binge drinkers

Among binge drinkers (N=323), the overall fit of the final model (Figure 3) to the observed data was excellent. The null hypothesis that the model is correct to the observed data is not rejected \( \chi^2 = 7.409, p = 0.116 \). The small chi-square relative to the degree of freedom \( df = 4 \) is desirable when implying an acceptably fitting covariance matrix. The root mean square error of approximation (RMSEA) was 0.051, much smaller than the upper limit of 0.08 for acceptable fit. The adjusted goodness of fit index (AGFI) and goodness of fit index (GFI) are 0.966 and 0.991 respectively, higher than the typical target of 0.9. The estimated standardized direct, indirect, and total causal effects represented by the model are summarized in Table 2. Most of the estimated direct effects are statistically significant \( z > 2.0 \) among binge drinkers.
and most of them are of practical importance (i.e., all are larger than roughly 0.1). Moreover, the signs of all of these effects are consistent with the directions hypothesized in H1, H2, H3, and H4 among binge drinkers. Among moderate drinkers, in spite that the overall model fit of the final model was excellent as well \(\chi^2 = 3.183, p = 0.528\), however, most of the estimated direct and indirect effects were statistically insignificant. So, the hypotheses tests will be confined mainly to the binge drinking group.

H1 predicted positive associations between personal reactance proneness and psychological reactance. The path from psychological proneness and psychological reactance was 0.112 \((z > 2)\) in the binge drinking group data. The association from the moderate drinking data was not significant \((0.079, z < 2)\). Therefore, H1 received support from the binge drinking data set.

H2 anticipated a positive correlation between threat to freedom and psychological reactance. The path from threat to freedom to psychological reactance was 0.142 \((z > 2)\) among binge drinkers. The association between two variables among moderate drinkers was weak \((-0.079)\) and statistically not significant \((z < 2)\). Therefore, H2 was strongly supported by binge drinking data set again. Overall, the determinant with the largest total causal effect on psychological reactance was the perceived threat to the freedom (V2) by the social norms messages with the most total effect due to the direct effect. These outcomes indicate that social norms messages trigger threat on college student’s desire to maintain autonomy and self-determination in their drinking behavior, especially among binge drinkers.

Among binge drinkers, the primary determinants of attitudes (V4) towards binge drinking were psychological reactance (V3) with a direct effect of 0.122 with a significant effect size \((z > 2)\). So, H3 was confirmed. Even though there were indirect effects from reactance proneness
(V1) and psychological threat to freedom (V2), there effects were trivial with a combined effect of 0.032 with insignificant effect sizes.

The behavioral intention to binge drink (V5) is mainly determined by psychological reactance (V3) with a direct effect of 0.159. So, H4 was confirmed. The comparatively larger direct effect of psychological reactance on the behavioral intention than attitude in regard to binge drinking implies that the psychological reactance generated by the social norms message seems to have more emotional attributes than cognitive ones. While the effect of psychological reactance (V3) on the intention to binge drinking (V5) was enhanced by indirect effects transmitted via reactance proneness (V1) and perceived threat to the freedom (V2), the indirect effects were very trivial with a combined effect size of 0.041.

Discussions

The college population surveyed in this study seemed to drink much when we apply the nationally accepted measures of binge drinking behavior (the 5/4 measure; 5 bottles for men and 4 bottles for women), because they drink average 6.1 bottles in one sitting. Moreover, as Table 1 indicates, the most common misperception among surveyed students is their beliefs that their fellow students drink more than they actually do, regardless of close friends or not. Average college students believe that their close friends or common students drink about seven and a half standard drinks over one sitting, which is almost one and a half drink more than actual drinking. The pluralistic ignorance (e.g., a majority of college students falsely assume that most of their fellow students drink more than they actually do) among surveyed college students seemed to support the social norms idea that a correct normative feedback may weaken the peer influence to drink more by demonstrating that college students actually drink moderately. However, the social norms messages were not transmitted and retained to the college student body as campaign
planners have anticipated. The first national evaluation of social norms feedback campaigns concluded that no decrease has been detected in alcohol consumption among college students (Wechsler et al., 2003). The outcomes of this study supported that psychological reactance must certainly play a central role in college students’ emotional responses to social norms messages, and it seems reasonable to assume that, among binge drinking college students, magnitude of freedom restricted and personal psychological reactance have critical impact on how social norms messages are processed. For the binge drinking college students, the variable of psychological reactance figured prominently as significant predictor of binge drinking attitude and intention.

The final model of this study (Figure 3) showed some modifications to the theory of reasoned action. The theory of reasoned action argues that attitudes are considered important because of their presumed association with related behavioral intentions or behaviors. The findings from this study do not necessarily challenge the basic conceptual underpinnings of the reasoned action model. However, the final model pointed to the need to develop a more effective application of the model in case new mediating variables were introduced like the variable of psychological reactance. In this study, among binge drinking college students, the findings show that the mediating psychological reactance variable is directly related to attitude (0.122, z value > 2) and behavioral intentions (0.158, z value > 2) respectively, with a stronger direct effect upon behavioral intentions. For this reason perhaps, the nature of psychological reactance is a combination of the purely cognitive (Petty & Cacioppo, 1986) and emotional (Dillard & Meijnders, 2002). The outcomes make us conclude that psychological reactance, when it is activated, should be viewed as a cognitive and affective amalgam, which means both anger and negative cognitive conditions should be assessed together. Out of the research outcomes, the
stronger direct effect of psychological reactance on behavioral intention than attitude indicates that binge drinking college students who were exposed to the social norms campaign messages activated strong emotional reactance that can exert a direct effect on behavioral intention. When the binge drinking college students in this study feel that their autonomy and self-determination are threatened by proscribed behavioral recommendations, they are more likely to show emotional reactions, rather than reasonably calculating the gains and losses of recommended behaviors. Further research is needed to know how certain message compositions relate with emotional or cognitive areas of psychological reactance and how differently activated psychological reactance effects attitude or behavioral intention.

Concerning the effects social norms campaign messages have on psychological reactance, among binge drinking college students, the findings indicate that psychological reactance is for the most part generated from feeling of restricted freedom by the influence of social norms messages (0.142, z > 2), not from the respondents’ personal traits of reactance proneness (0.112, z > 2). However, further research is needed to verify how and how much certain types of freedom restricting messages (e.g., fear appeal or social norms messages) activate the feeling of restricted freedom as well as underlying personal traits of reactance proneness, which in turn generate psychological reactance. One social norms trait that has increasingly been positive aspect of social norms campaigns is that it does not tend to employ scare tactics which are more likely to invoke rebellious responses from the college students. However, for a specific subgroup, the results of this study indicate that even social norms’ rather positive and less restrictive trait does generate the feeling of restricted freedom and innate reactance proneness that mainly lead to the activation of psychological reactance.
Practical Implications

False assumption of peer alcohol consumption and peer pressure existed among the college population in this study. Average student in this study overestimated his or her friend’s drinking about one and a half bottle and 48.8 % of students answered that they have experienced peer pressure to drink more according to the ’06 CORE survey. These baseline data certainly function as a groundwork prompting the implementation of social norms campaign. However, to a certain target group (e.g., binge drinking college students), a psychological reactance triggered by freedom threatening messages, whether it is positive or not, must certainly play a central role in a college student’s cognitive and emotional response to social norms messages. It also seems reasonable to assume that, among the subgroup of binge drinkers, the negative and reactionary response would be intensified compared with casual or moderate drinkers. To the binge drinking college students, the three variables of reactance proneness, threat to freedom and psychological reactance figure prominently as significant predictors of binge drinking attitudes and intentions. These three variables deserves the special attention of all those involved in anti-binge drinking message campaigns and evaluations.

As an idea, it is interesting to point out that the characteristic of campaign administrator/receiver relations should be a significant moderating variable between campaign messages and ensuing psychological reactance. This idea is in perfect accord with psychological reactance theory, which would suggest that, if anything, administrative prohibitions – especially when perceived as strict, prohibitive, or controlling – should be met with opposition in the form of resistance, noncompliance, even behaving opposite direction. However, not all administrative activities engender the boomerang effect. Well designed campaign programs and other types of supportive services are known to be inversely related to substance abuse (Wills & Vaughan,
As long as administrative influences of anti-binge drinking campaigns are applied with implicit and supportive rather than explicit and restrictive forces, college students can be expected to be more receptive and amenable. Collaboration with peer educator in residence hall, expansion of BASICS and intervention program with links to web page, promoting and attending late night activities, developing and expanding Facebook and MySpace group membership, and participating in all opening and transfer orientation programs are a few ideas of supportive actions that increase inclusiveness between two counterparts of social norms campaign. The inclusiveness created by these supportive actions may even function as a form of credibility restoration, offering college students a new type of positive assurance regarding the functions of college administrator benefiting their healthy college life. A message is more believable to the intended audience if the source has the credibility. More researches should be done to delineate who is the most credible and effective sources of delivering social norms messages to the college students – whether faculties, friends, health administrators, or strangers.

**Limitations and Suggestions for Future Research**

The generally weak causal relationships among variables can be attributed to the little attention given to the social norms messages by college students. This argument is consistent with other research outcomes of social norms campaigns: that most college students are not clearly aware of the purpose of the social norms campaign and are skeptical about the veracity of the campaign messages (Thombs, Dotterer, Olds, Sharp, & Giovannone, 2004). To better facilitate the effects of social norms campaigns, in addition to lessening the activation of psychological reactance, more creative tactics should be developed to attract college student’s attention to campaign messages as well as to enhance the comprehension and credibility of campaign ideas.
Perhaps one notable limitation of the method we used concerns external validity. Although the outcomes of social norms messages at the host institution appear to be quite similar to those found at other universities, the data used in this research were collected from just one college. Thus, there is some uncertainty about the generalizability of the findings. In this research, however, the online survey format of research design simulated a natural social norms campaign, which is quite similar to voluntary exposure to social norms messages in the college health campaign setting.
References


