Self-Determination, Perception of Peer Pressure, and Drinking Among College Students[1]

C. RAYMOND KNEE[2]
University of Houston

CLAYTON NEIGHBORS
University of Washington

Based on self-determination theory (Deci & Ryan, 1985b), the present research tested a model that incorporated motivational orientation, extrinsic reasons for drinking, and perceptions of peer pressure as predictors of drinking among college students. In a sample of undergraduates, support was found for a path model in which global motivation predicted extrinsic reasons for drinking, which predicted perceptions of peer pressure, which in turn predicted alcohol consumption. In addition, the relation between peer pressure and drinking was stronger for those who were oriented toward feeling controlled. Support was found for a similar model in a sample of fraternity students. Results support previous research on self-determination and health.

Alcohol consumption among college students has long been a popular public concern. Research suggests that an overwhelming majority of college students (88%), including those under the legal drinking age, have consumed alcohol (Johnston, O'Malley, & Bachman, 1995). In 1994, 67.5% of college students reported consuming alcohol in the past 30 days. Clearly, most college students drink occasionally. However, many of them frequently drink to excess or binge-drink. Johnston et al. found that 40% of college students reported binge drinking at least once within 2 weeks of being surveyed. According to these estimates, 40% of college students get drunk a minimum of 24 times per year; a figure that well exceeds the criteria for many standard definitions of alcoholism.

Further, drinking is not without consequences. Excessive drinking has been associated with damaged property, poor class attendance, hangovers, trouble with authorities, and injuries (Wechsler, Davenport, Dowdall, Moeykens, & Castillo, 1994; Wechsler & Isaac, 1992). In addition, research has demonstrated links between drinking among college students and unwanted sexual advances, unplanned and unprotected sex, sexual aggression, and sexual assault (Frintner & Rubinson, 1993; Koss & Gaines, 1993; Wechsler et al., 1994).

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[2]Correspondence concerning this article should be addressed to C. Raymond Knee, Department of Psychology, University of Houston, Houston, TX 77204-5341. E-mail: knee@uh.edu

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Drinking among college students typically occurs within a social context. One important element within this social context is pressure from peers to drink alcohol. Alcohol consumption by college students has been shown to be affected by the social behavior and drinking of those around them (Marlatt, Baer, & Larimer, 1995). For example, Geller and Kalsher (1990) found that college students at bars consumed more alcohol in groups than when alone. Also, research has shown that students typically perceive that peers drink more than themselves and that these exaggerated perceptions of others' drinking are associated with greater individual use (Baer & Carney, 1993; Baer, Stacy, & Larimer, 1991; Prentice & Miller, 1993). One would expect that levels of drinking would be higher in contexts where alcohol use is normative and peer pressure is relatively high. Fraternities and sororities are one example. Indeed, there is evidence that fraternity and sorority members drink more and drink more frequently than do nonmember college students (Baer, Kivlahan, & Marlatt, 1995; Marlatt et al., 1995; Wechsler, Dowdall, Davenport, & Castillo, 1995).

Because social influence is a powerful force in the context of drinking, it is important to identify factors that lead to differential perceptions of social pressure to drink. We believe that a motivational framework can be very useful here. We propose that both general motivational orientations as well as specific motivations for drinking might facilitate a better understanding of drinking as a function of peer pressure. Drawing largely from self-determination theory (Deci & Ryan, 1985b, 1991), we examined how motivational orientations relate to perceptions of peer pressure and alcohol consumption.

General Motivational Orientation

A key component of being motivated by and concerned about others' expectations can be derived from work on extrinsic motivation. Broadly, extrinsically motivated behaviors are those that are performed to obtain some incentive or to avoid some punishment (e.g., studying for an exam to obtain praise or to avoid retribution). These behaviors fall at one end of a continuum anchored by intrinsically motivated behaviors, which are those that are performed in the absence of any obvious incentive or punishment (e.g., studying for an exam because one enjoys learning and improving one's skills). The continuum of intrinsic–extrinsic motivation has been examined from a variety of perspectives and within several domains (Deci & Ryan, 1985b; Harter & Jackson, 1992; Vallerand, 1997) including educational settings (e.g., Grolnick & Ryan, 1989; Grolnick, Ryan, & Deci, 1991; Ryan & Connell, 1989), interpersonal settings (e.g., Blais, Sabourin, Boucher, & Vallerand, 1990; Hodgins, Koestner, & Duncan, 1996), and health settings (e.g., Ryan, Plant, & O'Malley, 1995; Williams, Grow, Freedman, Ryan, & Deci, 1996). Further, investigators have operationalized extrinsic motivation in various ways, including the aspirations that individuals endorse (Kasser & Ryan, 1993, 1996), coercive elements of the social context (Deci, Eghrari,

Patrick, & Leone, 1994; Deci, Spiegel, Ryan, Koestner, & Kauffman, 1982; Ryan, 1982; Ryan, Mims, & Koestner, 1983), the reasons that individuals report for engaging in various behaviors (Vallerand & Bissonette, 1992; Vallerand, Blais, Briere, & Pelletier, 1989), and individual differences in motivational orientations (Deci & Ryan, 1985a; Knee & Zuckerman, 1996, 1998; Koestner & Zuckerman, 1994).

This latter work on motivational orientations evolved from the assumption that people differ in the extent to which they regulate their behavior based on autonomy and choice or based on (either real or imagined) pressures to perform (Deci & Ryan, 1985a). Accordingly, Deci and Ryan developed a general measure of causality orientations that assesses the degree to which an individual's behavior is amotivated, self-determined, or controlled by others. Given our interest in an extrinsic motivational orientation, the controlled orientation subscale was particularly relevant to the current investigation. Controlled individuals tend to regulate their behavior according to external, rather than internal, cues and exhibit less consistency among their attitudes, traits, and behaviors (Koestner, Bernieri, & Zuckerman, 1992; Scherhorn & Grunert, 1988). In addition, the controlled orientation is correlated positively with the Type-A coronary-prone behavior pattern, public self-consciousness, and is associated with the adoption of a pressured, ego-involved stance toward achievement tasks (Deci & Ryan, 1985b; Ryan, Koestner, & Deci, 1991). Thus, the behavior of controlled individuals tends to be motivated extrinsically, being relatively more pressure- or reward-regulated than self-regulated. These individuals tend to respond strongly to performance pressures in their social environment, and thus may be more strongly affected by pressure from peers to drink alcohol. Along these lines, research has consistently found that extrinsic goals, aspirations, and strivings predict poorer health and well-being both concurrently and over time (Kasser & Ryan, 1993, 1996; Sheldon & Elliot, 1999; Sheldon & Kasser, 1998).

Domain-Specific Motivation

Another popular approach to assessing extrinsic motivation has focused on the reasons that people give for engaging in an activity (Vallerand, 1997; Vallerand et al., 1989). Much of the research on context-specific motivation is reflected in Vallerand's hierarchical model of intrinsic and extrinsic motivation. While this model shares many of the same assumptions of self-determination theory (Deci & Ryan, 1985b), it addresses the relations among different levels of motivation from global to contextual to situational. Global motivation is typically operationalized as a personality construct, such as the General Causality Orientation Scale (GCOS; Deci & Ryan, 1985a) or the Global Motivation Scale (Vallerand, 1997) and reflects a general motivational orientation toward a broad range of events and contexts. Contextual motivation refers to motivation within a

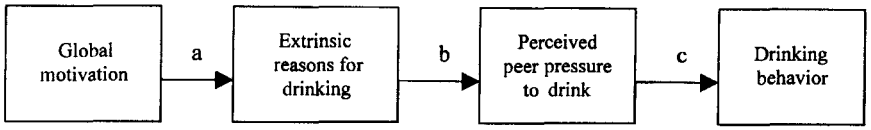

Figure 1. Proposed model of extrinsic motivation with regard to alcohol consumption.

specific domain, as in education (Vallerand & Bissonette, 1992) and romantic relationships (Blais et al., 1990) and is typically operationalized as a variant on the Academic Motivation Scale (Vallerand et al., 1989). For example, in response to the question "Why do you go to college?" potential reasons reflecting extrinsic motivation toward education include the goals of getting a prestigious job, feeling important, and proving that one is intelligent. Thus, extrinsically motivated reasons emphasize contingency and pressures toward living up to standards.

Situational motivation is typically measured by asking participants why they are engaged in their current activity (Vallerand, 1997). Vallerand's hierarchical model indicates that the effects of motivation proceed in a top-down fashion, from global motivation to situational motivation. That is, global motivation is presumed to affect contextual motivation, which, in turn, is presumed to affect situational motivation. Few published studies have assessed the simultaneous effects of motivation at multiple levels. Williams et al. (1996) provided one such study that supported Vallerand's top-down assumption. Williams et al. examined patients in a 6-month weight-loss program and found that global motivation, measured by the autonomy orientation of the GCOS (Deci & Ryan, 1985a), was linked to more specific motivation, operationalized as autonomous reasons for joining a weight-loss program. This specific motivation, in turn, predicted program attendance and subsequent weight loss.

Both self-determination theory and Vallerand's (1997) model view motivation on a continuum from intrinsic to extrinsic. We have chosen to focus on extrinsic motivation in our model of drinking because we are primarily interested in drinking that results from peer pressure, and only extrinsic motivation has a clear conceptual link to this kind of behavior. Borrowing from the aforementioned perspectives, we proposed the model depicted in Figure 1.

Consistent with previous literature (Vallerand, 1997; Williams et al., 1996) we propose that both global and specific motivations are important precursors to drinking behavior among college students. Specifically, we predict that extrinsic motivation at the global level will impact specific motivations for drinking, which will in turn impact perceptions of peer pressure and subsequent drinking. Accordingly, we examine controlled orientation, extrinsic reasons for drinking, and perceived peer pressure as predictors of drinking among college students. Path a suggests that one's general orientation toward feeling controlled would be

associated with more extrinsic reasons for drinking. Path b suggests a link between extrinsic reasons for drinking and perceptions of peer pressure to drink. Finally, Path c suggests a link between perception of peer pressure to drink and alcohol consumption.

It is important to note that we are interested in normative reasons for drinking given that these reasons are most conceptually linked to perception of peer pressure. Further, we are not arguing that motivation for drinking and perception of peer pressure are the only or even the most important variables in alcohol consumption. Vallerand and his colleagues (Vallerand, 1997; Vallerand et al., 1989) have argued that motivation within a particular context predicts behavior within that particular context. Thus, we expect that endorsement of extrinsic reasons for drinking (e.g., "I drink because refusing to drink is unsociable") might enhance the perception of pressure from one's peers, whether or not actual pressure is present. We only examine extrinsic reasons for drinking given that it is unclear how intrinsic reasons to drink would relate to peer pressure and subsequent alcohol consumption.

In addition to testing the full model, we are interested in potential moderators of the link between peer pressure and alcohol consumption. Although controlled orientation is not explicitly stated as a moderator in Vallerand's (1997) hierarchical model, it has been shown to moderate a variety of other self-esteem maintenance behaviors (Knee & Zuckerman, 1996, 1998). Controlled orientation in part reflects the degree to which one is concerned about pressures from oneself and others. Thus, we hypothesize that controlled orientation will moderate the association between peer pressure and alcohol consumption. Specifically, we predict that the association between peer pressure and alcohol consumption will be stronger for those who are oriented toward being controlled. Given that self-esteem and self-handicapping have been linked to both controlled orientation and drinking (Higgins & Harris, 1988; Knee & Zuckerman, 1998), we also test whether these two constructs account for the moderating effect of controlled orientation.

In a second sample consisting of only fraternity students, we tested a similar conceptual model of motivation, perceptions of peer pressure, and drinking. A fraternity sample was selected for several reasons. First, common thinking, as well as data, suggest that students in fraternities have more opportunities to drink (Wechsler, Dowdall, Davenport, & Castillo, 1995), given the frequency of large social events on behalf of the fraternity. Second, the norms for drinking within fraternities may be stronger. Thus, one would expect that fraternity students might experience more peer pressure to drink than their non-Greek counterparts. Third, because fraternity students on average tend to consume alcohol more frequently and in greater quantity than nonfraternity students (Wechsler et al., 1995), it is possible that fraternity students are at higher risk for drinking-related illnesses.

Method

Undergraduate Sample

Participants were 74 undergraduates (51 women, 23 men) enrolled in a social psychology course at the University of Houston. Students received extra credit for their participation. One women and 2 men were excluded based on fraternity or sorority membership. The sample included 28 Caucasian (40%), 13 Asian (18%), 15 African American (21%), and 11 Hispanic (16%) participants, as well as 4 participants of other ethnicities (5%). Participants were 8 freshmen (11%), 26 sophomores (37%), 29 juniors (41%), 7 seniors (10%), and 1 postbaccalaureate (1%). A majority of participants lived off campus with their parents (n = 37, 52%), whereas others lived off campus but not with parents (n = 29, 41%), or on campus (n = 5, 7%). The average age was 23 years (SD = 5.37).

Fraternity Sample

Participants were 53 University of Houston male volunteers, representing seven fraternities. A team of research assistants attended the weekly meetings of seven popular fraternities at the university and solicited volunteers for a study on personality and drinking among college students. The sample included 33 Caucasian (62%), 9 Asian (17%), 6 African American (11%), and 4 Hispanic participants (8%), as well as 1 participant of another ethnicity (2%). Participants were 9 freshmen (17%), 16 sophomores (30%), 23 juniors (44%), and 5 seniors (10%). A portion of the participants lived in fraternity housing (n = 16, 30%), whereas others lived on campus but not in a fraternity house (n = 7, 13%), off campus with parents (n = 12, 23%), or off campus not with parents (n = 18, 34%). Participants had been in the fraternity an average of 15 months (SD = 12.91), with some participants being members as long as 4 years. The average age was 21 years (SD = 1.79).

Procedure

Participants in the undergraduate sample completed all measures during class on the same day. There was no communication between participants. They were urged to answer all items honestly and were reminded that all answers would remain anonymous. Following the assessment, participants were debriefed and thanked for their participation. Measures were administered in a Latin square design to distribute potential order effects.

Participants in the fraternity sample were gathered separately. Volunteers from each fraternity were taken to a room and given instructions by the research assistant. Participants completed the questionnaires in small groups but were instructed to work individually. They were urged to answer all items honestly and were reminded that all answers would remain anonymous. Participants were thanked for their participation and were debriefed upon completion.

Measures

Controlled orientation. We used the controlled orientation subscale from the revised General Causality Orientation Scale (GCOS; Deci & Ryan, 1985a). The original GCOS consisted of 12 vignettes, 8 of which were achievement-related. The revised scale employed here was an expanded version that included an additional 5 vignettes that were explicitly interpersonal (Hodgins et al., 1996; Ryan, 1989). Each of the 17 vignettes is followed by a controlled orientation response, which the respondent rates on a 7-point scale of how characteristic it would be of him or her.[3] For example, one of the vignettes and its response is as follows:

Recently a position has opened up at your place of work that could have meant a promotion for you. However, a person you work with was offered the job rather than you. In evaluating the situation, you are likely to think: The other person probably "did the right things" politically to get the job.

Participants rate the response on a scale from 1 (*very unlikely*) to 7 (*very likely*). Scores are computed by averaging respondents' ratings across all 17 vignettes. Internal reliabilities (Cronbach's alpha) in this study were .79 and .83 for the undergraduate and fraternity samples, respectively.

Extrinsic reasons for drinking. Extrinsic reasons for drinking were assessed by 16 items administered on a 7-point Likert-type scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). Each item was prefixed by "I drink because . . ." Sample items include "I feel uncomfortable if I am the only person not drinking," "Most responsible adults drink," "I think I should drink," and "I feel that I must drink at parties." A principal components analysis along with a scree plot suggested primarily one factor, with eigenvalues of 6.04 and 5.50 accounting for 38% and 34% of the original variance in the undergraduate and fraternity samples, respectively. All loadings on this factor were greater than .40 in both samples. Internal reliabilities (alpha) were .87 and .86 for the undergraduate and fraternity samples, respectively.

Perceived peer pressure. A 10-item measure of perceptions of peer pressure was adapted from Keefe (1994). Participants rated each item on a 7-point scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). Sample items are as follows: "My best friends think I should drink at a party," "My best friends think that I should never drink" (reverse scored), "My best friends think that it's OK for me to have five or more drinks once or twice every weekend," and "My best friends think that I should not have one or two drinks nearly every day" (reverse-scored). Internal reliabilities were .86 and .80 for the undergraduate and fraternity samples, respectively.

Alcohol consumption. Alcohol consumption was measured by eight items. Four items were directed at binge drinking and asked on how many occasions the

[3]The GCOS includes subscales of autonomy and impersonal orientations as well, but these were not of interest in the present study.

participant consumed five or more drinks at one sitting (e.g., "During the past month, how many times did you have five or more drinks on one occasion?"). The other four items were more general questions about the number of drinks consumed in a given time frame (e.g., "On average, how many drinks per week do you consume?"). To create the primary criterion variable, the eight items on the drinking questionnaire were subjected to a principal components analysis followed by varimax rotation. A single factor emerged in both samples, with eigenvalues of 6.23 and 6.35 accounting for 78% and 79% of the original variance in the undergraduate and fraternity samples, respectively. Accordingly, the eight items were averaged to form an index of drinking with internal reliabilities of .95 and .96 for the undergraduate and fraternity samples, respectively.

Alternative constructs. Measures of self-esteem and self-handicapping were included to test whether any relations between controlled orientation, peer pressure, and drinking were merely a function of those participants having lower self-esteem or stronger tendencies to self-handicap. Self-esteem was measured by Rosenberg's (1965) 10-item measure that contains statements like "I feel I have a number of good qualities." Participants respond to each item on a 5-point Likert-type scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Internal reliabilities were .85 and .86 for the undergraduate and fraternity samples, respectively. Self-handicapping was measured by Jones and Rhodewalt's (1982) Self-Handicapping Scale, which is a 25-item instrument that samples a wide variety of self-handicapping behaviors (e.g., "I tend to put things off until the last minute"). It has been shown that those scoring higher on the Self-Handicapping Scale tend to use both behavioral and self-reported handicaps when facing threats to self-esteem (e.g., Rhodewalt, Saltzman, & Wittmer, 1984). Internal reliabilities were .74 and .69 for the undergraduate and fraternity samples, respectively.

Results

Undergraduate Sample

Table 1 presents the correlation matrix of measures including controlled orientation, extrinsic reasons for drinking, perception of peer pressure, drinking, self-esteem, and self-handicapping. As shown, controlled orientation was positively correlated with reporting extrinsic reasons for drinking and with somewhat (but nonsignificantly) more drinking. Consistent with previous research, controlled orientation was also correlated with a stronger tendency to self-handicap (Knee & Zuckerman, 1998). Extrinsic reasons for drinking were positively correlated with perception of peer pressure, drinking, and self-handicapping. As our model would predict, the pattern of correlations between extrinsic motivation and drinking behavior appear somewhat stronger when motivation is measured with regard to the specific context, rather than globally. Finally, perception of peer pressure was positively correlated with drinking.

Table 1

Zero-Order Correlations Among Measures on the Undergraduate Sample

Measure	1	2	3	4	5	6
1. Controlled orientation	—					
2. Extrinsic reasons	.44**	—				
3. Peer pressure	.13	.54***	—			
4. Drinking	.21†	.42**	.48***	—		
5. Self-handicapping	.26*	.47***	.19	.08	—	
6. Self-esteem	.10	-.03	-.02	.19	-.56***	—

Note. *N*s range from 50 to 71.
†$p < .10$. *$p < .05$. **$p < .01$. ***$p < .001$.

We used path analysis to test the conceptual model displayed in Figure 1. To assess the fit of the model, we computed the chi-square statistic, the goodness-of-fit index (GFI), and the Tucker-Lewis Index (TLI). The TLI was included because it is stable across smaller samples such as ours (Bollen, 1989; Williams et al., 1996). Fit indexes and path coefficients were obtained with the AMOS (Version 3.6) software package using maximum likelihood estimation. Only participants with complete data are included in the path analyses. Of 71 nonfraternity students, 50 had complete data.

Figure 2 provides the path coefficients for the model. The hypothesized model fit the data well, $\chi^2(3, N = 50) = 3.62, p = .31$, GFI = .96, TLI = 0.97. Further, all path coefficients were significant at the $p < .01$ level. In addition to our hypothesized model, we employed a steplike procedure to determine if additional paths that were consistent with our perspective would improve model fit. Specifically, we examined whether direct paths from extrinsic reasons for drinking to alcohol consumption (Path d) and from controlled orientation to peer pressure (Path e) would improve the fit of the model. A direct path from extrinsic reasons to drinking would suggest that extrinsic motivation to drink is directly associated with more drinking, without regard to how such motivation might relate to perception of more peer pressure to drink. A direct path from controlled orientation to peer pressure would suggest that merely having a general orientation toward being controlled is directly associated with perceiving more pressure from one's peers, without regard to one's specific motivation to drink. Results indicate that neither of the additional paths significantly improved model fit, χ^2difference(1, $N = 50$) = 1.87, *ns*; χ^2difference(1, $N = 50$) = 1.59, *ns*, for models with Paths d and e, respectively. Further, adding both paths simultaneously also did not result in an improved model, χ^2difference(2, $N = 50$) = 3.47, *ns*.

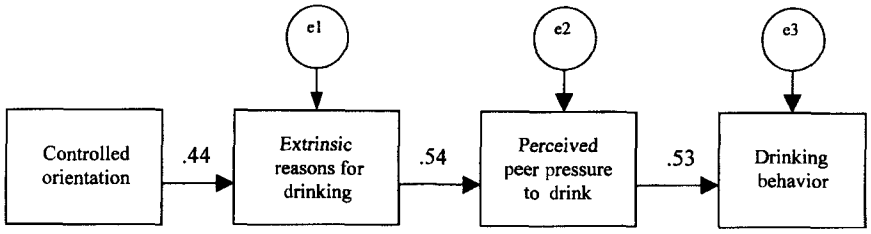

Figure 2. Path model of global motivation, extrinsic reasons for drinking, peer pressure, and alcohol consumption (e1, e2, and e3 are residual errors).

To examine whether perceived peer pressure mediated the relationship between extrinsic reasons for drinking and alcohol consumption, we conducted a hierarchical multiple regression analysis. According to Baron and Kenny (1986), evidence for B mediating the relationship between A and C exists when A predicts C, A predicts B, B predicts C, and the relation between A and C is reduced or eliminated when controlling for B. Accordingly, we found a positive relationship between extrinsic reasons and drinking ($r = .42$, $p < .01$), between extrinsic reasons and peer pressure ($r = .54$, $p < .001$), and between peer pressure and drinking ($r = .48$, $p < .001$). Finally, when predicting drinking as a function of extrinsic reasons and controlling for peer pressure, the relationship between extrinsic reasons and drinking was no longer significant, $F(1, 47) = 1.83$, *ns*, *pr* (partial correlation) = .19, suggesting that the effect of extrinsic reasons on drinking was largely mediated by peer pressure.

We also hypothesized that the relation between peer pressure and drinking would be moderated by controlled orientation. Accordingly, a hierarchical multiple regression analysis was conducted on the drinking index. Gender, perceived peer pressure, and controlled orientation were entered at Step 1, followed by the 3 two-way product terms at Step 2. The three-way product was entered at Step 3 to test whether the hypothesized effect differed with gender. Perception of peer pressure to drink at Step 1 was associated with more drinking, $F(1, 58) = 16.27$, $p < .001$, $pr = .47$. Step 2 revealed that although a trend emerged such that the relation between peer pressure and drinking was particularly strong among controlled individuals, this trend was not statistically significant, $F(1, 55) = 3.07$, $p < .08$, $pr = .23$. However, in partial support of the hypothesis, Step 3 revealed a significant interaction between peer pressure, controlled orientation, and gender such that the predicted interaction between peer pressure and controlled orientation was particularly strong among men, relative to women, $F(1, 54) = 8.24$, $p < .01$, $pr = .36$. Figure 3 presents drinking scores derived from the regression equation at Step 3 as a function of perceived peer pressure, controlled orientation, and gender. Analysis of the Peer Pressure × Controlled Orientation interaction within each gender showed that controlled orientation significantly moderated

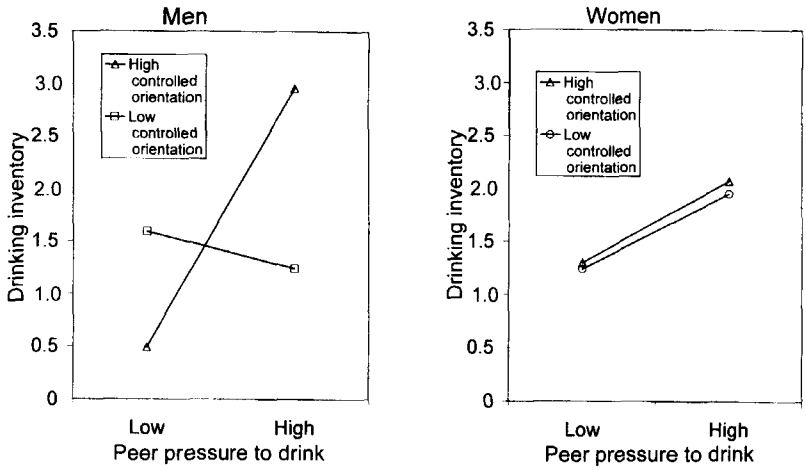

Figure 3. Drinking as a function of peer pressure, controlled orientation, and gender.

the relation between peer pressure and drinking among men, $F(1, 16) = 9.44$, $p < .01$, $pr = .61$; but not significantly among women, $F(1, 38) < 1$, $pr = .02$.

It was possible that the moderating effect of controlled orientation on the link between peer pressure and drinking was a function of controlled individuals having lower self-esteem and thus responding more strongly to peer pressure because of feelings of inadequacy, rather than a controlled motivational orientation. Accordingly, the hierarchical multiple regression analysis was repeated by adding self-esteem in Step 1, the relevant product terms at Step 2, and the Peer Pressure × Self-Esteem × Gender product at Step 3. The interaction between peer pressure, controlled orientation, and gender remained significant, $F(1, 50) = 4.17$, $p < .05$, $pr = .28$, whereas the alternative interaction with self-esteem was not significant, $F(1, 50) = 1.50$, $p = .22$, $pr = .17$.

Given that previous work has linked motivational orientations to self-handicapping (Knee & Zuckerman, 1998) and self-handicapping to drinking (Higgins & Harris, 1988), it was possible that the moderating effect of controlled orientation was a function of controlled individuals having stronger tendencies to self-handicap. Accordingly, the hierarchical multiple regression analysis was repeated, substituting self-handicapping for self-esteem where relevant. Again, the interaction between peer pressure, controlled orientation, and gender remained significant, $F(1, 50) = 10.00$, $p < .001$, $pr = .41$, whereas the alternative interaction with self-handicapping was not significant, $F(1, 50) = 2.57$, $p = .11$, $pr = .22$. Thus, it was not the case that the relation between peer pressure and drinking among controlled men was a result of those individuals having lower self-esteem nor stronger tendencies to self-handicap.

In sum, our hypotheses were largely supported. First, path analysis confirmed that the hypothesized model provided a good fit for the data. Thus, general motivational orientation was associated with domain-specific motivation to drink. This extrinsic motivation to drink was in turn related to stronger perceptions of peer pressure, which in turn was linked to more alcohol consumption. Adding paths from motivation to drink directly to drinking did not significantly improve the model, nor did the addition of a path from general motivational orientation to perception of peer pressure. Second, we also found that perception of peer pressure mediated the relation between domain-specific motivation and alcohol consumption. Such mediation is consistent with the notion that extrinsic reasons for drinking influence perceptions of peer pressure, which in turn influence alcohol consumption.

Third, we found partial support for the hypothesis that the relation between peer pressure and drinking would be moderated by controlled orientation. A higher level three-way interaction revealed that the hypothesis was supported primarily among men. Thus, it was men who felt controlled who tended to drink as a function of peer pressure. The moderating effect of controlled orientation was not supported among women. Although these latter results are consistent with the notion that drinking may be more "expected" for men than for women, in this study, men did not perceive significantly more pressure from peers, nor did they report significantly more drinking than women, $rs < .16$.[4]

Fraternity Sample

To ensure that the seven fraternities (A through G) from which we sampled were not significantly different on variables of interest, we began by examining homogeneity of responses among members of different fraternities. Accordingly, we conducted a MANOVA predicting controlled orientation, extrinsic reasons, perceived peer pressure, and drinking as a function of the fraternity to which participants belonged. The overall MANOVA was not significant, Wilks's $\Lambda = .50$, $F(24, 141) = 1.29$, *ns*, suggesting that responses did not differ by fraternity.

Table 2 presents the correlation matrix of measures including controlled orientation, extrinsic reasons for drinking, perceptions of peer pressure, and drinking, as well as self-handicapping and self-esteem. Results were largely similar to those in the undergraduate sample. As shown, controlled orientation was associated with reporting more extrinsic reasons for drinking and a stronger tendency toward self-handicapping. Extrinsic reasons for drinking were associated with

[4]According to these results, controlled orientation would seem to have two roles within the same model in that it not only predicts more extrinsic reasons for drinking, but also moderates the path from perception of peer pressure to drinking. It should be noted that both of these roles are consistent with existing research and theory on controlled orientation. We would expect that controlled orientation would be associated with more extrinsic reasons for drinking and that those who are more susceptible to drinking under pressure would be higher in controlled orientation.

Table 2

Zero-Order Correlations Among Measures on the Fraternity Sample

Measure	1	2	3	4	5	6
1. Controlled orientation	—					
2. Extrinsic reasons	.37**	—				
3. Peer pressure	.14	.25†	—			
4. Drinking	.15	.40**	.51***	—		
5. Self-handicapping	.48**	.30*	.09	.29*	—	
6. Self-esteem	-.20	-.35*	-.01	.11	-.46**	—

Note. *Ns* range from 50 to 53.
†$p < .10$. *$p < .05$. **$p < .01$. ***$p < .001$.

perceiving somewhat more peer pressure and reporting more general drinking, as well as a stronger tendency toward self-handicapping and lower self-esteem. Peer pressure itself was strongly related to more drinking, and drinking was related to a stronger tendency to self-handicap, as previous literature has suggested (Higgins & Harris, 1988). Finally, self-handicapping was related to lower self-esteem, as has been demonstrated elsewhere (Zuckerman, Kieffer, & Knee, 1998).

To compare fraternity and nonfraternity students, we combined the data and included fraternity membership as a variable. Demographically, fraternity members did not differ from nonfraternity members in ethnicity, $\chi^2(5, N = 124) = 8.43$, *ns*. Not surprising, nonfraternity members were more variable in terms of age, $F(57, 49) = 9.09$, $p < .001$, and tended to be older, t for unequal variances (71) was 3.21, $p < .01$. With regard to the variables in our conceptual model, as expected, fraternity members felt somewhat more controlled ($r = .18$, $p < .06$), gave more extrinsic reasons for drinking ($r = .31$, $p < .01$), perceived more peer pressure ($r = .35$, $p < .001$), and reported more drinking ($r = .48$, $p < .001$), compared to their nonfraternity counterparts.[5,6]

[5]Noting the confound between fraternity membership and gender, we also examined correlations between fraternity membership and each of the variables in our conceptual model including only the male participants from the nonfraternity sample. Despite a substantial reduction in statistical power, fraternity members still exhibited significantly higher levels of all variables except controlled orientation, which remained in the expected direction but was no longer significant. Given that fraternity members also tended to be younger than nonfraternity members, we also compared them on the same variables controlling for age. Again, effects were relatively unchanged except that, controlling for age, fraternity members no longer exhibited higher levels of controlled orientation.

[6]The significant age differences were largely a result of participants who were more than 2 standard deviations above the mean. We re-ran the path models after dropping 4 such participants from the nonfraternity sample and 2 such participants from the fraternity sample. No changes in the significance of paths or fit were found.

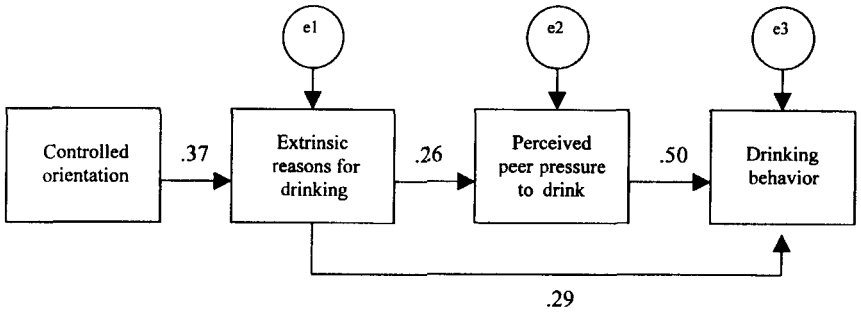

Figure 4. Path model of global motivation, extrinsic reasons for drinking, peer pressure, and alcohol consumption among fraternity students.

Model Testing

Using the fraternity sample, we again used path analysis to test our conceptual model. The hypothesized model fit the data relatively well, $\chi^2(3, N = 50) = 6.44$, $p = .09$, GFI = .94, TLI = .78. Further, two of the three path coefficients were significant at the $p < .01$ level. The coefficient for extrinsic reasons predicting peer pressure was marginally significant ($p = .07$). In addition to our hypothesized model, we again used a steplike procedure to determine if additional paths that were consistent with the theoretical perspective would improve model fit. Although adding a direct path from control orientation to peer pressure did not improve model fit, χ^2difference$(1, N = 50) = 0.08$, *ns*, adding a direct path from extrinsic reasons to alcohol consumption did significantly improve model fit, χ^2difference$(1, N = 50) = 6.36$, $p < .01$, with the new model fitting the data well, $\chi^2(2, N = 50) = 0.08$, $p = .96$, GFI = 1.00, TLI = 1.18. This revised model is displayed in Figure 4.

Adding both paths simultaneously did not yield a better fit than the model including only the path from extrinsic reasons to drinking, χ^2difference$(1, N = 50) = .08$, *ns*. Thus, for the fraternity sample, the best fitting model included a direct path from extrinsic reasons to drinking. This suggests that whereas in the nonfraternity sample the relationship between extrinsic reasons and drinking was mostly mediated by peer pressure, in the fraternity sample the relationship between extrinsic reasons and drinking was only partly mediated by peer pressure.

We further examined this interpretation by conducting hierarchical multiple regression according to Baron and Kenny's (1986) mediation criteria. We again found positive relationships between extrinsic reasons and drinking ($r = .40$, $p < .01$), extrinsic reasons and peer pressure ($r = .25$, $p < .10$), and between peer pressure and drinking ($r = .58$, $p < .001$). When alcohol consumption was predicted

as a function of extrinsic reasons controlling for peer pressure, the relationship between extrinsic reasons and drinking remained significant, $F(1, 48) = 5.55$, $p < .05$, although the effect size (standardized beta) was reduced from .40 to .31, suggesting partial mediation.

As with the undergraduate sample, we conducted hierarchical multiple regression analysis to determine if the relation between peer pressure and drinking varied as a function of controlled orientation. Peer pressure and controlled orientation were entered at Step 1, followed by the product term at Step 2. Perceiving more pressure was again strongly associated with more reported drinking, $F(1, 49) = 15.69$, $p < .001$, $pr = .49$; however, the interaction with controlled orientation was not significant, $F < 1$.

Alternative Model

It is reasonable to assume that, in some cases, students may first perceive pressure from peers and that this pressure then becomes a reason to drink. This would suggest an alternative model in which the roles of extrinsic reasons and perception of peer pressure are reversed. Indeed, there may be considerable conceptual overlap between extrinsic reasons for drinking and perceptions of peer pressure. One key difference, however, is that one may have many other extrinsic reasons for drinking, in addition to or in place of pressure from one's peers (e.g., "I drink because it relieves the pressure I am under").

To test the alternative model in both samples, we reversed the location of extrinsic reasons and perception of peer pressure and examined the chi squares, fit indexes, and path coefficients. The alternative model reflected a poorer fit, along with a significant chi square in the undergraduate sample, $\chi^2(3, N = 50) = 20.21$, $p < .001$, GFI = .84, AGFI = .48, TLI = .16; and the fraternity sample, $\chi^2(3, N = 50) = 23.67$, $p < .001$, GFI = .83, AGFI = .43, TLI = -.29. Thus, the data are more consistent with the hypothesized model in which having extrinsic reasons for drinking predicts increased perceptions of pressure to drink.

Discussion

Based on self-determination theory (Deci & Ryan, 1985b, 1991), the present research tested a model that incorporated motivational orientation, extrinsic reasons for drinking, and perceptions of peer pressure as predictors of drinking among college students. The model was derived from previous research on context-specific motivation (e.g., Vallerand, 1997), along with previous research on self-determination and health (e.g., Williams et al., 1996).

In a sample of undergraduates, support was found for a path model in which global motivation predicted extrinsic reasons for drinking, which predicted perceptions of peer pressure, which in turn predicted alcohol consumption. It was

also found that perception of peer pressure almost completely mediated the relation between extrinsic reasons for drinking and reported drinking. Thus, drinking for extrinsic reasons was linked to perceiving more peer pressure to drink, which was then related to more drinking. Consistent with self-determination theory, it was also found that one's global motivation moderated the relation between perceived peer pressure and drinking. Specifically, the relation between perceptions of peer pressure and drinking was stronger for individuals who were oriented toward feeling controlled, particularly among men. Thus, it was men who were higher in controlled orientation that were particularly susceptible to drinking as a function of the pressure they perceived from their peers. Further, this moderating effect was not a result of self-handicapping or self-esteem, but was specific to a controlled (less self-determined) motivational orientation.

In a second sample, we examined fraternity students and found support for a similar model. Again, those who felt more controlled reported more extrinsic reasons for drinking, which in turn predicted perception of peer pressure to drink and more reported drinking. In addition, among fraternity students, support was also found for a direct path from extrinsic reasons to reported drinking. Thus, among fraternity students, drinking for extrinsic reasons (e.g., "because people like me more when I have had a few drinks") was associated with more alcohol consumption, both directly and as a function of increased perception of peer pressure.

Another difference among fraternity students was that, unlike nonfraternity students, support was not found for a moderating effect of one's global motivational orientation. Fraternity students appeared to drink as a function of peer pressure, regardless of how controlled they generally felt. Examination of how fraternity students differed from nonfraternity students on other variables might shed light on why general controlled orientation did not play a moderating role. For example, fraternity members felt somewhat more controlled, gave more extrinsic reasons for drinking, perceived more peer pressure, and reported more drinking compared to their nonfraternity counterparts. Perhaps, then, drinking in fraternities is more expected, normative, and pressured to begin with. If so, then students may tend to drink as a function of perceiving pressure to do so, regardless of whether they generally feel pressured in other contexts.

This would certainly seem consistent with research showing that fraternity students tend to have biased perceptions of normative drinking, view their social reputations more positively, and view heavy drinking as more acceptable (Baer et al., 1991; Larimer, Irvine, Kilmer, & Marlatt, 1997), and that Greek membership in general is conducive to more excessive and problematic drinking (Lo & Globetti, 1995). Also, members of Greek organizations are more likely to believe that alcohol is a vehicle for friendship, social activity, and sexual opportunity (Cashin, Presley, & Meilman, 1998). Indeed, a recent review of research on fraternity drinking noted the central role of alcohol in fraternity socialization and the

enabling environment of the fraternity house as common themes in the empirical literature (Borsari & Carey, 1999). Still, some evidence suggests that people who join fraternities are already more likely to drink, and may join to facilitate or enhance their drinking (Baer, 1994; Lo & Globetti, 1995; O'Connor, Cooper, & Thiel, 1996). Thus, fraternity students might already be higher on controlled orientation and be drawn to the relatively regimented rules, norms, rituals, punishments, and social pressures of fraternity life.

The present research is not without limitations. First, our measures of drinking were based on self-report. It would have been helpful to have indirect measures of drinking, such as one's friends' reports. Second, the present research is based on data from a large urban university in which most students commute daily rather than live on campus, which limits the generalizability of the findings. The present samples might be more diverse in ethnicity and age, and these students might have fewer opportunities to drink and participate in fraternities than students at other universities. Third, we focused primarily on extrinsic reasons for drinking rather than a broader continuum of introjected, identified, and integrated reasons for drinking. Future researchers might want to examine this larger array of possible reasons, as self-determination theory would suggest. Finally, the present findings are based on a cross-sectional, nonexperimental design and thus do not indicate the causal direction of effects.

Despite these limitations, the present findings have several implications. First, they support previous research on self-determination and health in which feeling less self-determined has been associated with poorer health outcomes (e.g., Kasser & Ryan, 1993, 1996; Ryan et al., 1995; Williams et al., 1996). Feeling controlled and providing more extrinsic reasons for one's behavior have been linked to less adaptive outcomes in several domains, including educational settings, romantic relationships, and medical contexts. The present results indicate that feeling controlled and being extrinsically motivated are also linked to more alcohol consumption among college students, and in a manner consistent with self-determination theory (Deci & Ryan, 1985b, 1991).

Another implication is that the same quality that might lead controlled, extrinsically motivated individuals to drink at parties might also lead them to be particularly receptive to social influences for positive change. It is possible, given the results for nonfraternity students, that these individuals might be more receptive to interventions and remedial attempts that address perceived norms and pressures from peers. In the undergraduate sample, it was men who felt controlled who tended to drink as a function of peer pressure. Among fraternity students, however, it would seem that both their motivation for drinking, as well as their susceptibility to peer pressure may be at work. Given the direct and indirect effects that we found among fraternity students, attempting to influence either peer pressure or one's motivation to drink, by themselves, may not be effective. Interventions targeted at reducing drinking among fraternity students might need

to address both the motivation for drinking as well as peer pressure and social norms.

The present findings seem consistent with recent work that suggested that self-presentation could have negative consequences for a variety of health behaviors (Leary, Tchividjian, & Kraxberger, 1994). For example, the desire to attain peer acceptance and social approval has been shown to be a major reason why people drink alcohol (Farber, Khavari, & Douglas, 1980). This desire to be viewed as socially vigorous, adventurous, and loyal would seem to be particularly strong among individuals who feel less self-determined and more extrinsically motivated. Indeed, in both studies here, feeling less self-determined and providing more extrinsic reasons were associated with perceiving more pressure from peers and in turn with more alcohol consumption.

Finally, future research could examine whether a similar process operates with other negative health behaviors that are grounded in social influence (e.g., smoking, drug use, unprotected sex). Concern about one's image in the eyes of others has been implicated in a variety of negative health behaviors (Leary et al., 1994), and feeling less self-determined might be associated with a similar responsiveness to perceptions of peer pressure, whether the pressure is to drink, smoke, do drugs, or have unprotected sex.

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