HHS Public Access

Author manuscript

Pers Soc Psychol Bull. Author manuscript; available in PMC 2024 January 04.

Published in final edited form as:

Pers Soc Psychol Bull. 2008 September ; 34(9): 1249–1259. doi:10.1177/0146167208319385.

Evidence for Positive Mood Buffering Among College Student Drinkers

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Abstract

Positive experiences play an important role in buffering the effects of negative experiences. Although this process can play out in a myriad of contexts, the college context is one of particular importance because of significant concerns about student stress levels and alcohol abuse. Building on evidence that at least some students drink in response to negative experiences, we considered the possibility that positive moods would moderate college student negative mood–drinking relationships. Using a Web-based daily process study of 118 (57% women) undergraduate student drinkers, the authors reveal that positive moods indeed buffer the effects of negative moods on student drinking, depending on the mood and drinking context. Furthermore, the buffering of ashamed mood appears to explain the buffering of other negative moods. Implications of these findings are considered in terms of the relationship between negative self-awareness and drinking to cope.

Keywords

alcohol consumption; college student drinking; positive moods; shame; buffering

Positive experiences play an important role in enhancing well-being, as well as altering or buffering the effects of negative experiences. Specifically, models of positive emotion describe how positive emotional experiences buffer the effect of negative experiences (e.g., Fredrickson, Tugade, Waugh, & Larkin, 2003). Although this process can play out in a myriad of contexts, the college context is one of particular importance because student stress levels and behavior, such as alcohol use, can combine to lead to higher levels of depression (Voelker, 2004) and numerous negative social consequences (e.g., Wechsler et al., 2002). In considering the problem of college student drinking, much attention has been placed on normative influences and students' motivation to drink to have fun with others. Yet at least

some students also drink to alleviate negative experiences (e.g., Mohr et al., 2005); this may be particularly true for experiences of negative self-awareness (e.g., Hull, 1981). Drinking to cope, in turn, is associated with increased potential for alcohol-related problems and abuse (Cooper, 1994; Neighbors, Lee, Lewis, Fossos, & Larimer, 2007). One limiting factor to such detrimental drinking behavior may be the potential for positive experiences; that is, students may be less inclined to drink to cope if their negative experiences are buffered by positive ones. The purpose of this study is to consider the influence of positive experiences, particularly positive moods, on college students' drinking-to-cope behavior patterns.

Drinking to Cope

Drinking-to-cope motivation is predicated on the tension-reduction hypothesis (Conger, 1956), which posits that alcohol consumption relieves distress caused by stressful situations, thereby reinforcing drinking in similar situations. Drinking-to-cope motivation is conceptualized as an aversive motivational process, whereby people drink as an affect regulation strategy to escape or avoid negative experiences. It is theorized to be more closely associated with solitary drinking rather than social drinking; social and solitary drinking are thought to be somewhat distinct behaviors, with unique antecedents and consequences (Cooper, 1994). Indeed, consistent with Cooper, recent research on both college student and adult daily drinking patterns revealed that negative experiences were more closely associated with solitary drinking (i.e., at home, alone) than social drinking (i.e., away from home, with others; Mohr et al., 2001; Mohr et al., 2005). Furthermore, Mohr et al. (2005) demonstrated that negative mood–drinking relationships were strengthened on evenings when time spent with friends was lower, supporting the notion that this is a more solitary context.

Whereas the tension-reduction hypothesis presumes that all negative experiences have the potential to trigger alcohol consumption, Hull's (1981) self-awareness model posits that individuals drink to escape from negative self-evaluation that results from heightened self-awareness following failure. Specifically, self-awareness following a failure experience will lead to negative affect and self-evaluation (Hull, 1981; Steenbarger & Aderman, 1979), which in turn will lead to efforts to reduce self-reflection. Alcohol can play a fundamental role in this reduction process, in that alcohol disrupts the encoding process of self-relevant information, leading the individual to be less sensitive to the information (Hull, 1981; Hull, Levenson, Young, & Sher, 1983).

Evidence from the emotions literature suggests that this negative self-relevant affect may be best represented as shame. In particular, shame concerns a global negative feeling about the self (Lewis, 1971; Tangney & Dearing, 2002). Not only is shame extremely negative and painful, but when an individual feels shame, the tendency is to focus on his or her negative self (as opposed to his or her negative behavior; Lewis, 1971; Tangney & Dearing, 2002). Shame incites negative self-evaluation and scrutiny, which can be demoralizing; in addition, individuals who are experiencing shame often want to conceal themselves from the outside world because they are afraid of public humiliation (Tangney, Wagner, Fletcher, & Gramzow, 1992). People who suffer from shame often drink to numb their psychological pain, which in turn leads them to feel more shameful; thus, a negative cyclical pattern may emerge (Tangney & Dearing, 2002). Indeed, shame proneness has been associated with

substance abuse problems among college students (Dearing, Stuewig, & Tangney, 2005), providing evidence of the shame–drinking cycle. Based on Hull's self-awareness model, then, students may drink more when their sense of shame is heightened in an effort to reduce self-awareness and thereby reduce the negative emotional impact of shame.

Although numerous studies have investigated the link between negative moods, including shame and drinking, only a few recent studies have used daily process designs to investigate negative mood–drinking associations among college students (e.g., Hussong, Galloway, & Feagans, 2005; Hussong, Hicks, Levy, & Curran, 2001; Mohr et al., 2005). Although it is meaningful to consider the relationship between average mood and alcohol use (as many previous between-person studies have), daily process studies have the advantage of considering the proximal within-person association predicted by motivational models; that is, whether college students drink more at home at times when they experience greater negative mood, relative to times when they experience less negative mood. Results of the two most relevant studies have been mixed in that one study did not find a negative mood–drinking association among college students (Hussong et al., 2005), whereas the second study demonstrated a relationship between daytime negative moods and evening consumption (Mohr et al., 2005). However, neither study considered consumption as a function of shame.

Indeed, although we are aware of no study that has linked daily shame with consumption, Hussong and colleagues (Hussong et al., 2001; Hussong et al., 2005) examined both daily and weekly guilt-drinking associations and did not find significant relationships. However, in the 2001 study, they did find that students' weekend hostility, but not other negative moods, positively predicted consumption during the following weekdays. Yet, according to Tangney and colleagues (Tangney & Dearing, 2002; Tangney, Wagner, Fletcher, et al., 1992), shame is strongly linked with anger and hostility, such that shame can give rise to anger and hostility when an individual works to deflect the consequences of negative emotions away from self and onto others. Thus, anger and hostility may show similar relationships to drinking as shame.

Positive Mood Buffering

Whereas shame may be a powerful motivator of drinking-to-cope behavior, positive emotions have the potential to reduce the experience of negative emotions (Fredrickson, 2000; Tugade, Fredrickson, & Feldman-Barrett, 2004), including shame, thereby reducing the need to drink to cope. In particular, Fredrickson (1998, 2000) argues that positive emotions serve to correct or negate the effects of negative emotions, by "down-regulating" the psychological and physiological effects of negative emotions (Fredrickson, 2000; Tugade et al., 2004). One outcome of this down-regulation should be a reduction of the negative emotion and negative emotion-related outcomes, including health outcomes (Fredrickson, 2000). In one particularly relevant study, Fredrickson et al. (2003) supported their hypothesis that positive emotions experienced over the 10 days after September 11th would buffer the negative influence of the event on depressive symptoms experienced over the same period, particularly for resilient people. These effects were theorized to be explained by the "undoing effects" of the positive emotional experiences on cardiovascular reactivity.

In the present study, we are interested in considering whether the presence of positive moods might buffer or reduce the detrimental effect of negative moods, particularly shame, on tension-reduction drinking. If people are drinking to relieve shame associated with negative self-evaluation, the shame–drinking association should be reduced when positive experiences are present. If such buffering effects are revealed, they may be mediated or brought about by changes in physiological arousal, based on the Undoing Hypothesis (e.g., Fredrickson & Levenson, 1998). We propose to take the first step in understanding this mediational process by examining how positive moods can change or buffer the negative mood–drinking association, a necessary condition for the Undoing Hypothesis to be operating. In support of our approach, Wills, Sandy, Shinar, and Yaeger (1999) documented that positive affect buffered the effect of negative affect on substance use among 7th through 10th graders. However, their analyses were cross-sectional by year in school, which are suggestive but do not directly address the key question of interest: Is the effect of negative mood on daily drinking lessened on days when positive mood is relatively higher? That is, contrary to cross-sectional analyses, within-person daily process studies allow one to better understand the temporal association between positive and negative moods and drinking, which is central to buffering and tension-reduction models.

To our knowledge, no previous study has considered the buffering effect of positive moods on daily negative mood–drinking associations. In the closest study to date, Mohr et al. (2005) examined evidence to support the multidimensional model of alcohol consumption, wherein college students were theorized to drink due to coping, enhancing, conforming, and social motives. Mohr et al. also examined whether each of the four between-person motives moderated within-person positive experience–drinking and negative experience–drinking associations. Importantly, that study demonstrated negative experience–drinking associations among college students. Furthermore, daytime positive mood was related to drinking away from home but not drinking at home that evening. This supports the notion that positive experience–motivated drinking is more social than solitary. However, in the current study, we actually propose a different effect of positive moods, when they occur in the context of greater negative mood. Whereas positive mood is directly related to increased social consumption, we propose that positive mood can also reduce drinking in solitary contexts by reducing the influence of negative experiences. Thus, in the present study, we considered positive mood buffering using the Mohr et al. (2005) sample.

Present Study

The current study uses a daily process approach (Tennen, Affleck, Armeli, & Carney, 2000) to examine the buffering effects of positive moods on negative mood–drinking associations by considering whether positive moods moderate negative mood–drinking associations. Specifically, we examined whether negative moods, particularly shame, were more strongly related to drinking at home or away from home when students experienced lower positive mood than when they experienced higher positive mood on that day. That is, we expected that students would drink more at home on days when they experience greater shame relative to days on which they experience less shame; yet that relationship would be contingent on the level of positive mood experienced. Thus, we hypothesized that the shame–drinking at

home relationship would be stronger on days with lower positive mood relative to days with higher positive mood.

Finally, we considered whether gender differences were evident in negative mood–drinking and buffering associations. Because women experience greater shame relative to men (Tangney & Dearing, 2002), they may be more likely to demonstrate a shame–drinking relationship. Yet drinking to cope is more common among men than women (Cooper, Russell, Skinner, Frone & Mudar, 1992). Furthermore, women demonstrate a weaker stress–response dampening effect than men (Abrams & Wilson, 1979; Armeli et al., 2003), which may give them less motivation to drink to cope. Positive emotion buffering studies have not considered potential gender differences. Thus, we did not render specific hypotheses for gender.

METHOD

Participants

Participants included 118 student drinkers (51 men, 67 women) who were selected from a larger sample of 152 college students recruited via the psychology department's participant pool and in-class solicitations; 30 participants were excluded from the current analysis because they were abstinent during the 21-day study.[1] The average participant was 18.9 years old (SD = 1.16), mostly European American (91.5%), and all were unmarried. The majority of students were in their 1st (50%) or 2nd (32%) year of college, living in a coed dorm (89%), with few (11%) reporting membership in a fraternity or sorority. The sample of 122 students had an average completion rate of 17.4 days of the 21-day study (SD = 3.4). Of the 2,562 potential reporting days (122 participant × 21 days), participants completed the daily survey on 2,126 days (83%). Additional details regarding compliance issues are provided in Mohr et al. (2005).

Procedure

Interested students attended an informational session in which they provided informed consent, after which they were instructed to complete an initial Web-based questionnaire. Students received an e-mail reminder the night before the study began and each morning thereafter. Then for 21 days, students logged on to a password-protected Web site every afternoon to complete their brief daily survey regarding their moods and alcohol consumption. Access to the daily Internet page was limited to the hours between 3:30 p.m. and 7:00 p.m., a time selected to coincide with the end of the students' school day but before the start of evening activities. Participants were not allowed to make up previous day's missed entries. This eliminated the possibility of bias resulting from retrospective reporting. Students were awarded course credit in exchange for their participation; students who demonstrated perfect compliance were also eligible for a cash award and potential lottery prizes.

[1]As reported in Mohr et al. (2005), 4 students in the original 152 sample demonstrated mood-drinking slopes over 3 standard deviations above or below the mean, which resulted in unexpectedly large variance components in the HLM analyses and biased estimates of within-person slopes. As a consequence, these individuals were excluded from those analyses and for similar reasons were not included in the present sample.

Measures

Alcohol consumption.—Participants recorded the number of alcoholic beverages they consumed the previous night after completing the previous day's survey. Participants recorded the number of alcoholic drinks consumed in each of two locations: at home and away from home. Drinking at home was defined as drinking in the student's own dorm room or apartment, and drinking away from home included examples of settings such as drinking at a friend's apartment or dorm room or a bar. Response options included drink amounts ranging from 0 to 12 and greater than 12 (coded as 13); one alcoholic beverage was defined (both in the training and on the Web page) as one 12-ounce beer, 4-ounce glass of wine, or 1-ounce glass of spirits.

Negative moods.—As part of each daily interview, participants recorded the extent to which each of 9 words described their mood that day, by clicking on the appropriate response. Specifically, *nervous*, *jittery*, *sad, dejected*, and *bored* mood items were included based on Larsen and Diener's (1992) mood circumplex model. Other mood items included *ashamed, guilty, hostile*, and *angry*, taken from the Positive and Negative Affect Schedule (Watson & Clark, 1994; Watson, Clark, & Tellegen, 1988). Participants rated each mood category on a 5-point scale ranging from 0 (*not at all*) to 4 (*extremely*).

Positive moods.—Eight positive moods were assessed as part of the previously described daily mood interview, including *cheerful*, *happy*, *excited*, *enthusiastic*, *content*, *relaxed*, *proud*, and *active*. Composite scores were created for each day's positive mood. The composite mood measure demonstrated good internal consistency, as determined for three randomly selected days to represent the beginning, middle, and end of the daily reporting period: α = .88 (Day 5), .83 (Day 12), and .87 (Day 18).

Data Analyses

To test our hypotheses, we conducted multilevel regression analyses using the Hierarchical Linear Modeling (HLM) program, Version 5.0 (Raudenbush, Bryk, Cheong, & Congdon, 2000), which allows for the estimation of within-person and between-person effects in unbalanced diary data. To consider how positive moods influenced the mood–drinking relationships, we created interaction terms between the person-centered values for all of our negative mood predictors and positive mood. In particular, the following models were estimated:

$$\text{Drink}_{it} = b_{0i} + b_{1i}(\text{Shame}_{it}) + b_{2i}(\text{Positive Mood}_{it}) + b_{3i}(\text{Shame} \times \text{Positive Mood}) + e_{it}. \quad (1)$$

where "Drink$_{it}$" is person *i*'s consumption on day *t*, b_{0i} is the predicted value of Drink for person *i* when all of the predictors equal 0 on day *t*, b_{1i} is the partial within-person regression coefficients for the negative mood predictors for person *i*, b_{2i} is the partial within-person regression coefficients for the positive mood predictor for person *i*, b_{3i} is the partial within-person regression coefficients for the interaction of negative and positive moods for person *i*, and e_{it} is a random residual component. Models were conducted separately for each negative mood, because of significant within-person intercorrelations among the negative

moods. Regressions were also conducted separately for drinking at home and away from home.

To model the association between daily moods and evening drinking, we predicted nighttime drinking reported on day $t + 1$ (for the previous evening) from afternoon mood states reported on day t. Unlike moods, discrete events such as number of drinks consumed can be measured the next day fairly reliably (e.g., Reis & Gable, 2000; Shiffman, 2000). Matching drinking to prior day's mood reports reduced the possible number of study days per person to 20 and missing data contributed to an additional reduction (losing 2 data points for every missing day), such that the average number of study days was 12.4 ($SD = 4.9$); one individual did not have consecutive days of data and thus was dropped from the HLM analyses. The resulting analysis sample was composed of 117 participants.

All of the Level 1 predictors were person centered; thus, b_{0i} can be interpreted as the predicted value of alcohol consumption at the person's average level of the Level 1 predictors. We modeled intercepts and slopes as random effects, except for the variance components for the interaction slopes, which were all fixed to zero, based on guidelines provided by Snijders and Bosker (1999). Six day-of-week dummy variables were included in the models as fixed effects (see Bryk & Raudenbush, 1992, p. 151), to account for weekly cycles observed in alcohol consumption (e.g., Mohr et al., 2001; Mohr et al., 2005). Because our outcome variables (number of drinks) were counts, we conducted nonlinear multilevel regression analyses for drinking at home and drinking away from home using a Poisson sampling model with a log-link function (Raudenbush & Bryk, 2002).

We also examined the effects of gender (Level 2 variable) on within-person relations (Level 1 slopes), whereby the Level 1 intercepts and slopes were regressed on the Level 2 predictor. In our estimation procedure, we included an intercept model of average level of drinks as a function of gender, as well as individual differences in negative mood–drinking and positive–mood drinking slopes (b_0, b_1, and b_2). Of interest, however, is Equation 2, which shows the Level 2 regression model predicting the Level 1 within-person interaction of positive and negative moods on drinking:

$$b_{3i} = \gamma_{30} + \gamma_{31}(\text{Gender}) + u_{3i}\,. \tag{2}$$

In these equations, the Level 1 slopes (b_{1i} through b_{3i}) are modeled as a function of gender and random-person effects (e.g., u_{1i}). With the Level 2 predictor, grand mean-centered γ_{31} can be interpreted as the difference between men and women in the buffering effect of positive moods on the ashamed mood–drinking relationship.

RESULTS

Descriptive Statistics

Before proceeding with the multilevel models, we were interested in examining the average experience of students across study days. Thus, we created aggregate mood and drinking variables, which represent the mean of sad mood, for example, across the 21 study days. These descriptive results are presented in Table 1. The majority of students experienced

relatively low levels of each negative mood, with men reporting lower levels of sad, nervous, and jittery moods than women. Means for all of the negative mood variables were highly intercorrelated at the between-person level, with the exception of nervous and bored moods. Students with higher average positive mood reported less sadness during the study and those with higher levels of angry, hostile, and ashamed moods drank more at home during the study. Although these relationships are interesting, telling us how students in our study differed from one another, on average, they cannot inform the meaningful within-person buffering relationships of interest (see Kenny, Bolger, & Kashy, 2001; Tennen & Affleck, 1996). In the following section, we present our multilevel modeling results, according to procedures described in the Data Analyses section.

Positive Mood Moderation

Results of our multilevel modeling analyses are presented in Table 2, including the effects of negative moods, positive moods, and the Negative Mood × Positive Mood interaction. Of interest are the significant interaction effects providing evidence consistent with positive mood buffering. As revealed in Table 2, positive mood moderated most negative mood–drinking at home associations. The form of most associations was similar, whereby higher levels of positive moods were associated with diminished negative mood–drinking associations. For interpretation purposes, we re-estimated each model using recentered positive mood values to represent higher levels of positive mood (defined as 1 *SD* above the person's mean) compared to lower levels of positive mood (1 *SD* below the person's mean). As shown in Figure 1, on days with higher levels of positive mood, the ashamed mood–drinking association was not significant ($b = -.02$, $p = .92$). However, the ashamed mood–drinking at home association was significant and positive ($b = .74$, $p < .001$) on days with lower levels of positive mood. Similar to the relationship depicted in Figure 1, on days with higher levels of positive mood, increasing levels of angry mood were not associated with drinking at home ($b = .18$, $p = .17$); for days with lower levels of positive mood, increasing levels of angry mood were associated with greater drinking ($b = .86$, $p < .001$).

Furthermore, on days with higher positive moods, the nervous mood–drinking at home association was not significant ($b = .13$, $p = .11$); yet on days with lower levels of positive mood, the relationship was significant and positive ($b = .59$, $p < .001$). Moreover, on days with higher positive moods, the hostile mood–drinking at home association was not significant ($b = .22$, $p = .08$). However, on days with lower levels of positive mood, the relationship was significant and positive ($b = .57$, $p < .001$). The guilty mood–drinking at home association was significant and positive on days with lower levels of positive mood ($b = .72$, $p < .001$). Yet on days with higher levels of positive mood, the relationship was diminished but retained significance ($b = .33$, $p < .05$). In contrast, the bored mood–drinking at home association was significant and negative on days with lower levels of positive mood ($b = -.17$, $p < .05$). On days with higher levels of positive mood, the relationship was not significant ($b = .07$, $p = .41$).

For drinking away from home, only one of the Negative × Positive Mood interactions was significant and is depicted in Figure 2. Consistent with buffering, on days when individuals experienced higher levels of positive mood, the guilty mood–drinking away from home

relationship was not significant (b = .09, $p = .46$). On days when individuals experienced lower levels of positive mood, the guilty mood–drinking away from home relationship was significant and positive (b = .38, $p < .01$).

Gender Moderation

Next, we considered the possibility that gender differences would be revealed in the positive mood buffering effects (see Equation 2), uncovering several differences for drinking at home. First, gender significantly moderated the Nervous Mood × Positive Mood interaction ($\gamma = .17$, $p < .001$). Comparing lower positive mood days (1 *SD* below the mean on positive mood) with higher positive mood days (1 *SD* above the mean on positive mood), as shown in Figure 3, we found a strong positive relationship between nervous mood and drinking at home on low positive mood days, but only for men. All other relationships (for men on high positive mood days and for women on both types of days) were relatively small. Similar moderation effects were revealed for guilty and hostile moods ($\gamma = .18$, $p < .001$ and $\gamma = .27$, $p < .001$). Gender also significantly moderated the Angry Mood × Positive Mood interaction, but in the opposite direction to the previous findings ($\gamma = -.23$, $p < .05$), where women showed a strong positive relationship between angry mood and drinking at home on low positive mood days.

Supplemental Analyses

Because of the similar buffering findings across multiple negative moods, we considered the possibility that they were due to strong relationships among certain negative moods. In particular, as previously described, shame is related to anger and hostility, where shame may lead to anger and hostility (e.g., Tangney, Wagner, Fletcher, et al., 1992). Accordingly, the buffering of ashamed mood may account for the buffering of angry and hostile moods. The relationship between nervousness and shame is more complex (e.g., Tangney, Wagner, & Gramzow, 1992), and although shame and guilt are related, they are distinct in many ways (e.g., Tangney, Miller, Flicker, & Barlow, 1996). Thus, it is difficult to predict how the buffering of those moods might be related. To consider the question, we conducted a follow-up paired analysis including ashamed with each of the other discrete negative moods for which a significant negative interaction was detected predicting drinking at home, as depicted in Equation 3 for ashamed and angry moods:

$$\begin{aligned}\text{Drink}_{it} = {} & b_{0i} + b_{1i}(\text{Shame}_{it}) + b_{2i}(\text{Positive Mood}_{it}) + b_{3i}(\text{Shame} \times \text{Positive Mood}) \\ & + b_{4i}(\text{Angry}_{it}) + b_{5i}(\text{Angry} \times \text{Positive Mood}) + e_{it}.\end{aligned} \tag{3}$$

It was interesting that when angry and ashamed moods were entered in the same model, the Angry × Positive Mood interaction was no longer significant ($b = .01$, $p = .93$), whereas the Ashamed × Positive Mood interaction was still significant ($b = -.30$, $p < .01$). Similarly, when hostile and ashamed were included in one model, the Hostile × Positive Mood interaction was no longer significant ($b = -.07$, $p = .25$), yet the Ashamed × Positive Mood interaction remained significant ($b = -.36$, $p < .001$). The same pattern of association emerged for guilty and ashamed moods, such that the Guilty × Positive Mood interaction was no longer significant ($b = -.06$, $p = .26$); however, the Ashamed × Positive Mood interaction remained ($b = -.27$, $p < .001$). Finally, when nervous and ashamed were included

in one model, the Nervous × Positive Mood interaction was no longer significant ($b = .08$, $p = .08$), whereas the Ashamed × Positive Mood interaction remained significant ($b = -.25$, $p < .001$). Thus, the buffering of ashamed mood appears to account for the buffering of angry, hostile, guilty, and nervous moods on drinking at home.

DISCUSSION

We found evidence of positive mood buffering among college student drinkers, particularly for drinking at home (i.e., in their dorm rooms or apartments). Positive moods reduced negative mood–related drinking for a number of negative moods. This moderating influence of positive moods may help to explain why drinking to cope is not more widespread, presumably because of plentiful opportunities on college campuses for positive experiences.

In particular, positive moods reduced negative mood–related drinking at home for angry, hostile, nervous, guilty, or ashamed moods. According to our supplemental analyses, the buffering of ashamed mood appeared to explain the other buffering effects for drinking at home. These findings are consistent with research on relationships between shame and other negative moods. Specifically, shame is related to anger and hostility and may lead to anger and hostility when an individual deflects negative emotions away from self onto others (e.g., Tangney, Wagner, Fletcher, et al., 1992). Buffering of shame may have the effect of reducing global negative feelings about the self, which reduces painful self-awareness or self-reflection thought to be a key motivator of tension-reduction drinking, according to Hull's (1981) self-awareness model.

Similarly, both shame and guilt involve regret, self-directed anger, and desires to make amends (Tangney et al., 1996). The buffering of shame may explain the buffering of guilt, because in both cases, positive moods are operating by reducing regret and anger toward self, which are also forms of negative self-evaluation. It is also not surprising that buffering of ashamed mood appeared to explain buffering of nervous mood, because shame proneness has been related to trait anxiety. Yet the form of the relationship between shame and anxiety is complex and not well understood (Tangney, Wagner, & Gramzow, 1992). Thus, the process by which these associations emerged is less clear, though we expect that the nervous mood–drinking association was related to negative self-evaluation given the same pattern of results for nervous mood as other negative moods.

That positive moods appeared to enhance bored mood–drinking associations suggests that the positive mood served to energize students' behavior. Boredom is distinct from the other negative moods, in that it is characterized as a neutral mood state with low activation (Larsen & Diener, 1992) as opposed to negative self-evaluative feelings. Bored mood–drinking associations are not likely a function of tension reduction, in that there is no such relationship in the absence of positive mood; it is the positive moods that bring about drinking when students are bored.

Consistent with tension reduction is the finding that most buffering effects were revealed for drinking at home (not away from home). Drinking at home is more typically associated with drinking to cope with negative experiences (Christiansen, Vik, & Jarchow, 2002;

Cooper, 1994). Drinking away from home, particularly at parties, is considered a more social drinking setting in which students drink to have a good time with friends; students hold expectancies about this context, in that they intend to go out and get drunk to be social (Christiansen et al., 2002). Based on experience enhancement motives, students may drink with others and in certain social contexts to enhance positive mood (Cooper, 1994). Our findings suggest, then, that positive moods protect against drinking to cope with negative experiences in contexts more conducive to such goals via buffering. However, consistent with experience enhancement and social motives for drinking, positive moods are directly associated with increased drinking.

Our analyses also revealed gender differences in the buffering of several moods, though not for shame. Despite women's greater experience of shame relative to men (Tangney & Dearing, 2002), their response to shame and subsequent buffering (and hence, many of the previously described processes) was similar. Yet presumably in the absence of shame, men demonstrate a buffering effect for nervous, guilty, and hostile moods, and women demonstrate buffering for angry moods. Social role theory of gender differences (Eagly, 1987) offers one interpretation for our findings, wherein men and women develop distinct skills and attributes as a result of a division of labor between the sexes. Because men occupy agentic roles, they are more assertive, controlling, and independent than women, whereas women occupy communal roles and are consequently more caring, nurturing, and sensitive (Eagly, 1987). Thus, men and women may be uniquely prepared to manage some emotions better than others; when they experience moods that are contrary to their unique social roles and expectations, they may resort to maladaptive coping, including drinking. In the absence of a buffer, women may drink more at home when they are angry because it is not socially acceptable for them to express anger (Averill, 1983) and they tend to self-suppress anger (Funabiki, Bologna, Pepping, & FitzGerald, 1980). Men, who are expected to be strong and assertive (Eagly, 1987; Kilmartin, 2000), may feel more vulnerable when feeling nervous and guilty, which leads them to drink when a buffer is not present. An explanation for why men rather than women demonstrate a similar pattern for hostile mood is less forthcoming and warrants further exploration. Moreover, all of these gender differences should be regarded as preliminary, given that they were not predicted and therefore need to be replicated, particularly with larger samples.

In sum, our findings are consistent with positive mood buffering, whereby positive emotions correct or negate the effects of negative emotions and negative emotion–related outcomes (Fredrickson, 2000). In the present study, we extended this research by showing that positive moods can reduce negative mood–related drinking. Such buffering effects are theorized to be mediated by the Undoing Hypothesis (e.g., Fredrickson & Levenson, 1998), one assumption being that positive buffers follow the negative experiences. Indeed, in the Fredrickson et al. (2003) study, the buffers occurred after the onset of the traumatic experience (i.e., September 11th). In the present study, we do not know the temporal relationship between the positive mood buffers and the negative moods they were buffering, only that they both occurred during the same daytime period. If future research determines that increases in positive moods occur after increases in the negative ones, these results would provide support for the hypothesis that the positive moods "undid" the negative effects of negative moods on drinking. Yet during stressful times, positive emotions co-occur with negative

experiences (Fredrickson et al., 2003), such that it may not be possible to determine ordering of emotional experiences in everyday life. Research is needed to explore these issues and determine whether ordering is important in terms of bringing about buffering effects.

Limitations and Future Directions

In the present study, we did not have complete information about the social or solitary context of drinking and whether others were present when students were drinking at home or away from home. We are not able to conclude that when students were drinking at home, they were engaging in solitary drinking. We included a limited number of drinking questions because we were concerned about reactivity (Mohr et al., 2005). Yet previous research examining similar relationships among adults has determined a high degree of overlap between models of drinking at home alone and drinking at home (Mohr et al., 2001). We were able to determine that on nights when students drank, they also spent time with friends; a relationship which was true for drinking at home and away (Mohr et al., 2005). However, an increasing level of time spent with friends reduced negative mood–drinking associations as well as positive mood–drinking at home associations, suggesting that students were drinking at home but not interacting with others. Research is needed that more deeply probes the solitary versus social context distinction in relation to buffering. One possibility is that friends are an important source of positive experiences that facilitate the buffering process. Because time with friends was concurrent with drinking but subsequent to positive moods, it was not possible to test this mediation model here. Furthermore, in the Mohr et al. (2005) study, we did not find a significant daytime positive social event–drinking association for either drinking at home or away from home, precluding the possibility that positive contacts influenced drinking via enhanced positive mood.

Another limitation of the present study concerns whether these results generalize beyond student drinkers to all drinkers. We anticipate that heavy drinkers (particularly binge drinkers) would be qualitatively distinct from moderate drinkers (e.g., Wechsler, Dowdall, Davenport, & Rimm, 1995; Wechsler & Nelson, 2001). Among the possibilities, there may be fewer opportunities for buffering among those who are alcohol dependent, because their mood–drinking associations may be muted. The college students in the current study were not, as a group, serious drinkers in terms of daily consumption and were not selected for risky or excessive drinking. Thus, we believe that our findings are representative of the typical college student, but we acknowledge that we examined a small sample from one university. Before conclusions are made about buffering and drinking, research on more diverse samples of drinkers is needed.

Implications

Our findings support the benefits of positive moods in alleviating the detrimental effects of negative moods, as they relate to negative self-evaluation. Yet in the college student drinking context, efforts to enhance positive mood can have unintended consequences, in that they may increase social drinking. Whereas drinking to cope is more closely associated with alcohol-related problems than social drinking (Cooper, 1994), students are drinking at alarmingly high rates (Wechsler et al., 2002). The most appropriate use of positive mood buffering may be with targeted interventions that reduce drinking to cope, as well as social

drinking. Our findings also support the potential utility of alcohol-free events, if they are perceived to be as enjoyable (i.e., positive) as drinking-related activities (Murphy, Barnett, & Colby, 2006).

In conclusion, we used a daily process methodology to uncover evidence of positive mood buffering among college student drinkers, revealing that positive moods do reduce the detrimental effects of many negative moods on drinking at home. This process appears to operate by reducing shame, thereby reducing the motivation to drink to dull negative self-awareness. Daily process measures have a distinct advantage over measuring average levels of moods and consumption, as many studies do, because the information could not be used to reflect on a dynamic unfolding process such as buffering. With these findings, we are able to offer insights into college student drinking, with implications for prevention of problematic drinking-to-cope patterns.

Acknowledgments

This research was supported by Grants R03-AA014598, T32-AA07290, and R29AA09917 from National Institute on Alcohol Abuse and Alcoholism. This research was also supported by research funding from Portland State University, including an Undergraduate Research and Creative Activity Award to the third author. Special thanks to M. Anne Carney for her assistance with this project.

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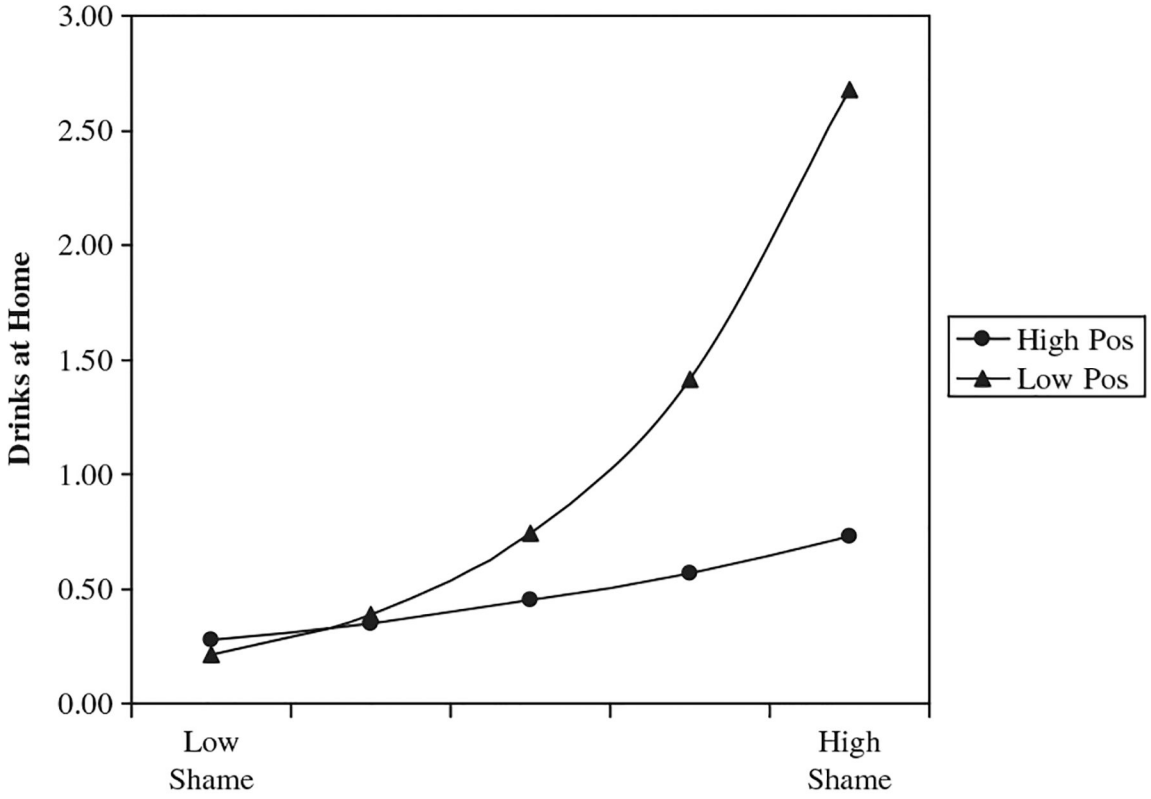

Figure 1.
Interaction between Ashamed and Positive Moods on number of drinks at home.

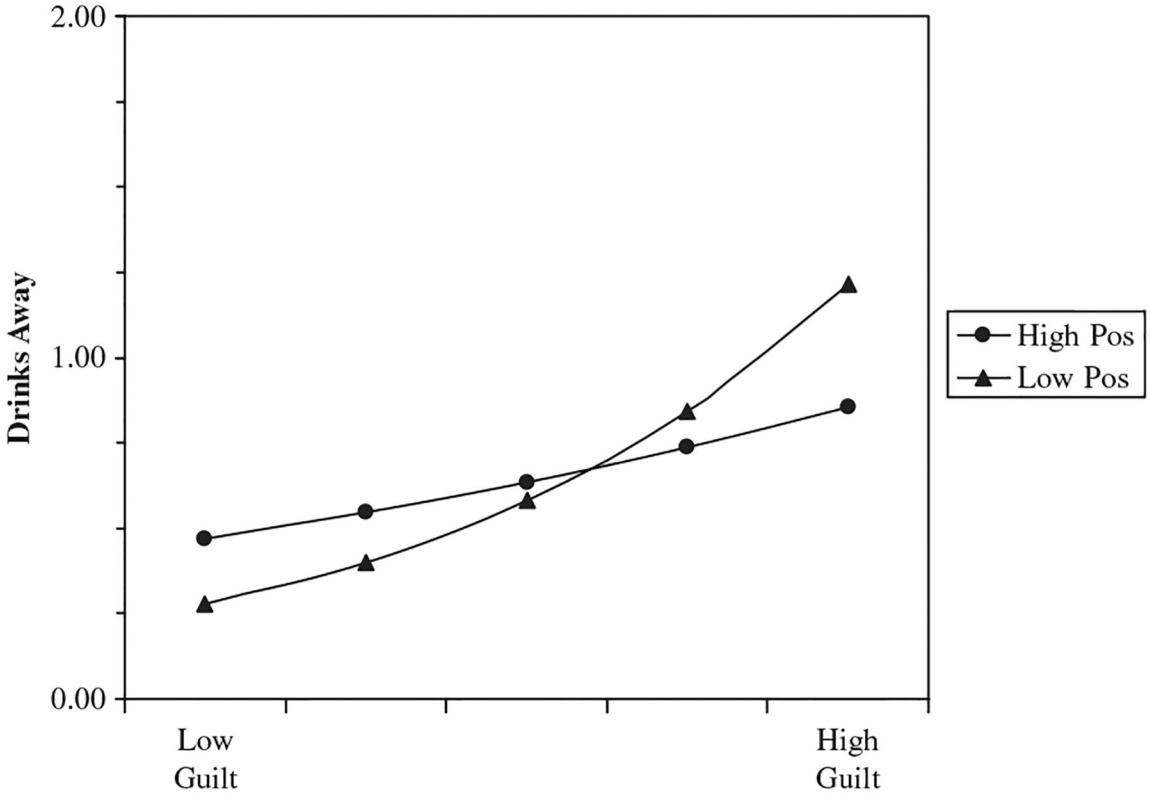

Figure 2.
Interaction between Guilt and Positive Moods on number of drinks away from home.

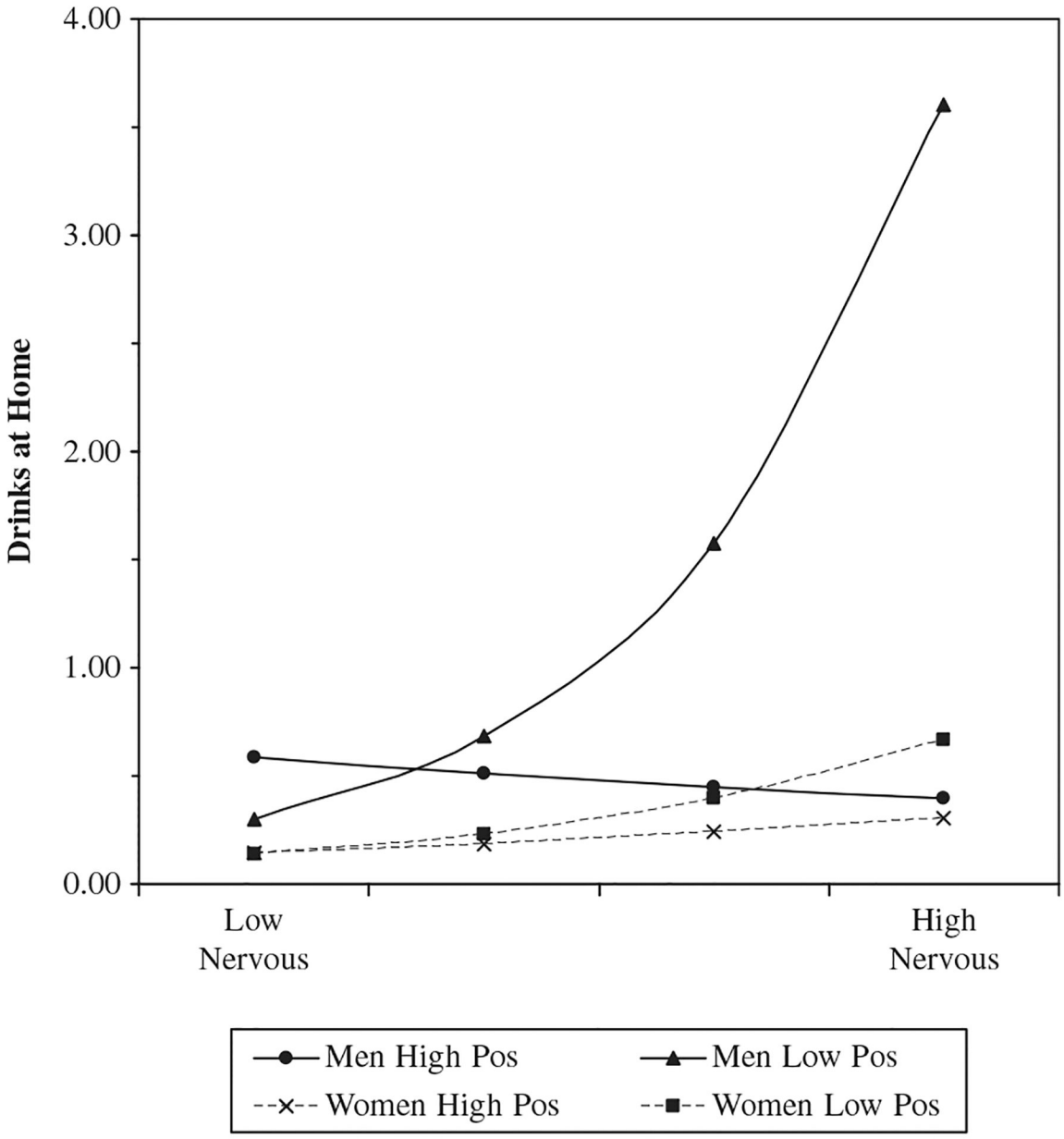

Figure 3.
Interaction between Gender, Nervous Mood and Positive Moods on number of drinks at home.

TABLE 1:

Descriptive Statistics and Between-Person Correlations With Aggregate Daily Variables

Variable	M	SD	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*
1. Gender	—	—												
2. Angry	.46	.40	−.02											
3. Sad	.59	.52	.27**	.74**										
4. Bored	.73	.46	−.17	.51**	.39**									
5. Nervous	.72	.53	.22*	.41**	.44**	.17								
6. Ashamed	.28	.38	−.05	.64**	.51**	.41**	.64**							
7. Hostile	.31	.36	−.06	.83**	.59**	.48**	.43**	.68**						
8. Guilty	.40	.46	.09	.50**	.50**	.31**	.70**	.78**	.53**					
9. Jittery	.49	.54	.19*	.43**	.52**	.25**	.75**	.60**	.47**	.70**				
10. Dejected	.39	.45	.03	.73**	.67**	.46**	.43**	.60**	.73**	.53**	.50*			
11. Positive mood	1.64	.52	.01	−.13	−.19*	−.06	.06	.04	.01	.06	.17	−.13		
12. Drinking at home	.56	.81	−.44**	.21*	.04	.15	−.05	.21*	.27**	.12	.07	.12	.05	
13. Drinking away	.96	1.01	−.21*	.04	−.07	.05	−.04	.12	.13	.05	−.02	.01	.09	.59**

NOTE: $N = 117$. Gender: males = −1, females = 1. Positive correlations indicate higher values for women relative to men.

*$p < .05$.

**$p < .01$.

TABLE 2:

Interaction Terms for Within-Person Negative Mood–Positive Mood Interactions

Coefficient	*At Home*	*Away From Home*
Ashamed	.42*	.40**
Positive Mood	.18*	.27*
Ashamed × Positive Mood	−.26***	.02
Angry	.54***	.23**
Positive Mood	.35**	.37**
Angry × Positive Mood	−.27***	.04
Sad	.23**	.13†
Positive Mood	.28**	.32**
Sad x Positive Mood	.02	.09†
Bored	−.03	.04
Positive Mood	.20*	.32**
Bored × Positive Mood	.11*	.06
Nervous	.36***	.14*
Positive Mood	.09	.32**
Nervous × Positive Mood	−.25***	.04
Guilty	.55***	.26*
Positive Mood	.15†	.22†
Guilty × Positive Mood	−.16***	−.11**
Hostile	.46***	.20*
Positive Mood	.20*	.24*
Hostile × Positive Mood	−.15***	.01
Dejected	.53***	.21†
Positive Mood	.22*	.21†
Dejected × Positive Mood	−.05	.06†
Jittery	.24†	.23**
Positive Mood	.18*	.17†
Jittery × Positive Mood	−.01	.01

NOTE: Analyses are controlled for the day of the week. Coefficients are interpreted as unstandardized regression coefficients.

† $p < .10$.

* $p < .05$.

** $p < .01$.

*** $p < .001$.