

Coping Motives Moderate Efficacy of Personalized Normative Feedback Among Heavy Drinking U.S. College Students

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ABSTRACT. Objective: Personalized normative feedback (PNF) interventions have received empirical support, are presumed to work by reducing normative misperceptions, and have been found to be particularly efficacious for those who drink for social reasons. However, PNF interventions also offer direct comparisons between one's own drinking and normative drinking, which may be especially important for coping drinkers. The present research evaluated whether reduced perceived norms and drinking at follow-ups varied as a function of coping motives. **Method:** Aims were examined as a secondary analysis of a PNF intervention study among 252 U.S. college students. Following baseline assessment, participants were randomly assigned to receive PNF or assessment only. Follow-up assessments occurred 3 and 6 months after baseline. **Results:** Findings indicated that the PNF intervention was more effective at both follow-ups in reducing drinking, but not alcohol

use problems, for participants scoring higher in coping motives. Furthermore, coping motives were the only drinking motive that uniquely moderated PNF efficacy. Analyses indicated that intervention effects on drinking varied as a function of coping drinking motives; however, intervention effects on norms did not vary by coping motives. Finally, coping motives were found to moderate associations between perceived norms and drinking. **Conclusions:** These results suggest that coping motives may be useful for identifying young adults—and presumably others—who can most benefit from PNF approaches. Furthermore, PNF may influence future drinking behavior through mechanisms other than changes in perceived norms. Future investigations could examine other pathways through which PNF may reduce drinking. (*J. Stud. Alcohol Drugs*, 77, 495–499, 2016)

PERSONALIZED NORMATIVE FEEDBACK (PNF) interventions correct normative misperceptions by presenting feedback comparing participants' own drinking, perceptions of peers' drinking, and peers' actual drinking (Lewis & Neighbors, 2007; Neighbors et al., 2004). PNF interventions have been shown to reduce drinking from 1 month (Dimeff & McNeely, 2000; Dumas et al., 2009) to 2 years (Neighbors et al., 2010) after baseline. The success of PNF may be a function of multiple underlying mechanisms; however, correction of normative misperceptions has been emphasized as the primary mediating mechanism underlying PNF and other social norms–based alcohol interventions (e.g., Burchell et al., 2013; Lewis & Neighbors, 2006).

Literature examining PNF has focused on susceptibility to social influences as a moderator of intervention efficacy. For instance, Neighbors et al. (2004) first examined the current data and found that socially focused drinkers (e.g., those scoring higher on social drinking motives, evaluations of social drinking consequences, and social alcohol outcome

expectancies) showed greater reductions in drinking. Although norms may be especially relevant for socially focused drinkers because of the social comparison component of norms, they may be less relevant for coping-motivated drinkers. Drinking to cope with negative affect has been identified as an indicator of heavy (Cooper et al., 2000; Labouvie & Bates, 2002; Montgomery et al., 1993) and problematic drinking (Kuntsche et al., 2005, 2008; Lewis et al., 2008; Martens et al., 2008).

Coping motives are directly (Carey & Correia, 1997; Martens et al., 2008; McNally et al., 2003; Park & Levenson, 2002) and indirectly (Carey & Correia, 1997) associated with alcohol-related problems. Coping motives may lead to hazardous drinking because individuals lack other, more effective coping strategies for regulating negative affect and related internal states (Cooper et al., 1995; Merrill & Thomas, 2013). Furthermore, in the absence of feedback, coping drinkers may not realize that their drinking patterns are atypical or maladaptive.

In the current study, we explored whether coping drinking motives uniquely moderate intervention effects on drinking. Coping drinkers tend to be a small but significant subgroup of drinkers who drink more problematically, for different reasons, and in different situations and contexts (Mohr et al., 2005). In addition, coping drinkers tend to be more prone to negative mood states and more reactive to such states, often

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resulting in drinking. We therefore expected that PNF might work better for coping drinkers, but not through changes in norms.

To test our hypotheses, the present research uses data that have been used to demonstrate efficacy of PNF and examine social moderators of intervention efficacy (Neighbors et al., 2004). The current study evaluated coping motives as a moderator of PNF efficacy and further considered whether intervention effects on drinking and norms vary as a function of coping motives.

We expected PNF to be particularly effective at reducing drinking among those endorsing higher coping motives. We further expected that intervention effects on perceived drinking norms would not differ by coping motives. In other words, reduced drinking at follow-up would be greater among those strongly endorsing coping motives for drinking, but this would not necessarily be attributable to changes in norms.

Method

Participants

Recruitment. A total of 1,115 students from psychology courses at a large northwestern university were screened for participation through mass testing. To participate, individuals had to meet heavy drinking criteria (4/5 drinks for women/men on one or more occasions in the last month) and provide their phone numbers so researchers could call them to schedule their assessments. A total of 481 individuals met criteria, and 252 (58% female) ages 18–34 ($M_{\text{age}} = 18.5$ years, $SD = 1.24$) participated. Participants reported the following racial backgrounds: 79.5% White, 13.7%, Asian, and 6.8% other.

Attrition. Two hundred fifty-two individuals completed baseline, 198 (79%) completed 3-month, and 207 (82%) completed 6-month follow-up assessments. To examine potential differences between individuals who completed the study and those who did not, a dichotomous variable was created to code for missing data, where 0 designated individuals who completed all assessments and 1 designated individuals who did not complete one or both follow-ups. This served as a grouping variable for independent samples t tests that were run on baseline weekly drinking, norms for weekly drinking, and coping motives. No significant differences were found ($ps > .15$).

Measures

Alcohol use. The Daily Drinking Questionnaire (Collins et al., 1985; Kivlahan et al., 1990) measured the number of standard drinks participants consumed each day of a typical week (Monday–Sunday) during the last 3 months. Typical weekly drinking was quantified by averaging the number of drinks that participants reported consuming each week.

Alcohol-related problems. The Rutgers Alcohol Problem Index (White & Labouvie, 1989) evaluated how often participants experienced 25 alcohol-related consequences in the past month, with response options ranging from 0 (*never*) to 4 (*10 times or more*). Two additional items assessed alcohol consequences related to driving. Responses were summed to create a total score. Reliabilities ranged from .81 to .88.

Coping drinking motives. The Drinking Motives Questionnaire–Revised (Cooper, 1994) assessed how often participants engaged in drinking for coping reasons using five items. An example item includes drinking “to forget about your problems” ($\alpha = .81$). Response options ranged from 1 (*never/almost never*) to 5 (*almost always/always*).

Perceived norms. The Drinking Norms Rating Form (Baer et al., 1991) asked participants to estimate the quantity of alcohol a typical student consumes each day of the week. Perceived weekly descriptive norms were calculated by summing estimations for each day.

Procedure

Assessments. Participants completed all assessments in the laboratory. After providing informed consent, participants completed measures of norms, alcohol use and problems, and coping motives at baseline. Then participants were randomly assigned to either the intervention ($n = 126$; 76 women) or control ($n = 126$; 72 women) groups. Participants received extra credit for completing baseline, \$15 for completing 3-month, and \$25 for completing 6-month follow-up assessments. See Neighbors et al. (2004) for further details.

Intervention. PNF was presented on a computer screen following the baseline assessment. Participants viewed the feedback for 1 minute on the computer screen and were given a printed copy to take home. Participants’ feedback was personalized based on their responses to questions in the preceding baseline survey and compared with norms from a previous study. Specifically, participants saw text and graphs showing how much and how often they drink, how much and how often they thought the average student on their campus drinks, and how much and how often the average student actually drinks. To examine potential baseline differences between conditions, a dichotomous variable was created where 0 designated the control condition and 1 designated the PNF condition. This served as a grouping variable for independent samples t tests that were run on baseline weekly drinking, norms for weekly drinking, and coping motives. No significant differences were found ($ps > .30$).

Results

Analysis

Statistical mediation approaches describe relationships among three variables: (a) predictor and mediator, (b) media-

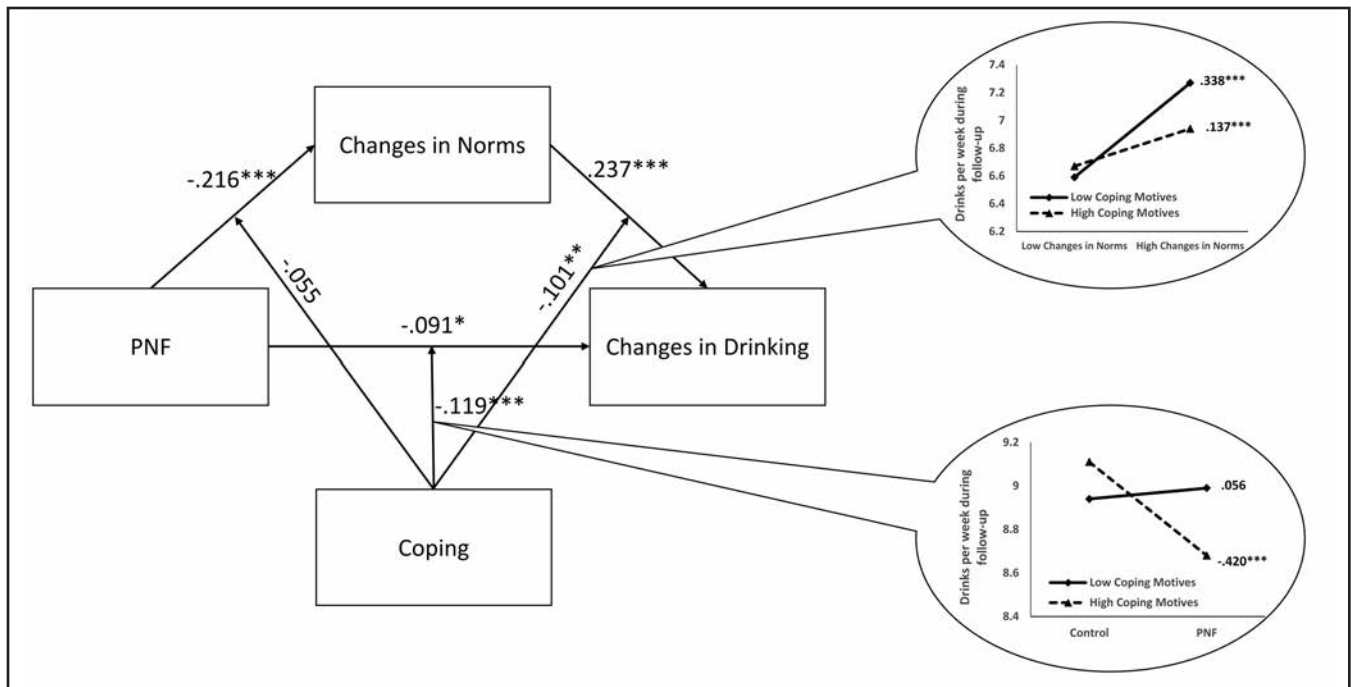


FIGURE 1. The effect of personalized normative feedback on follow-up drinking through changes in norms, as a function of coping drinking motives (i.e., moderated mediation on the *b* path and the direct path). Values displayed represent standardized beta coefficients. PNF = personalized normative feedback. * $p < .05$; ** $p < .01$; *** $p < .001$.

tor and outcome, and (c) predictor and outcome controlling for mediator (Edwards & Lambert, 2007; MacKinnon et al., 2007). Analyses focused on testing coping motives as a moderator of each of these pathways. Generalized estimating equations (Hardin et al., 2007) were fit using the SAS 9.4 GENMOD procedure (SAS Institute Inc., Cary, NC). This approach was chosen based on its flexibility and utility in examining correlated outcomes, which are a defining characteristic of longitudinal data. Variables were standardized before analyses. Primary results are presented in Figure 1. Sex, baseline norms and/or drinking, and time (T2 vs. T3) were included as covariates in all models but not included in the figure for parsimony.

We first examined follow-up drinking as a function of PNF, time, coping motives, and the product of PNF and coping motives, controlling for baseline drinking and sex. Results revealed an overall effect of feedback and moderation by coping motives, such that PNF worked better for individuals scoring higher in coping motives. This effect was not different between follow-ups. See callout in bottom right of Figure 1 for simple slopes of this interaction. When all motives were included, coping remained a significant moderator and none of the other motives moderated the PNF effect on drinking. No effects were found for the same model with alcohol-related problems as the outcome ($ps > .41$). Thus, our findings indicate that PNF effects on drinking are uniquely moderated by coping motives.

Next, models were fit assessing coping as a moderator of the effect of PNF on changes in norms and changes in

drinking. In the first model, follow-up perceived norms were examined as a function of baseline norms, sex, coping motives, time, and PNF as well as two- and three-way products of time, PNF, and coping. The interaction between coping and PNF was not significant, nor was the three-way interaction with time. Thus, there was no evidence for moderation of the *a* path.

We next examined follow-up drinking as a function of baseline norms, baseline drinking, sex, coping motives, time, PNF, and follow-up norms as well as two- and three-way products of time, PNF, and coping. Results revealed a significant *b* path (follow-up norms \rightarrow follow-up drinking), which was moderated by coping motives (weaker for coping drinkers; see the callout in the top right of Figure 1). The direct effect of PNF on drinking reductions (*c* path) depended on coping motives (reductions were seen for high scorers, $\beta = -.416$, $p < .001$, but not for low scorers, $\beta = .065$, $p = .564$). Thus, there was evidence for coping motives as a moderator of the *b* path and the direct effect.

Discussion

Thus far there has been little empirical exploration of moderators of PNF efficacy and alternative pathways from PNF to reductions in drinking. The current research is of particular importance, because coping motives for alcohol use may serve a maladaptive function for drinking (Cooper, 1994) and may constitute a malleable treatment target. The present findings suggest that PNF works better for coping-

motivated drinkers, but not for the same reason it works for others (i.e., changes in norms). This pattern of findings suggests that, among low-coping drinkers, PNF reduces drinking indirectly by reducing perceived norms. More specifically, the indirect effect of PNF on drinking through changes in norms was stronger for low-coping drinkers because of moderation in the *b* path but not the *a* path. Thus, although coping did not differentiate the extent to which PNF changed norms, lower copers appeared to be more affected by the changes in norms due to PNF.

Moreover, the stronger total and direct effects of PNF on drinking among high copers further suggests a unique process through which PNF reduces drinking. A possible explanation is that PNF may serve a diagnostic purpose for coping drinkers by alerting individuals that their drinking is excessive, which may prompt them to consider changing their drinking, independent of changing their norms for drinking. Additional research is needed to consider alternative explanations.

Consistent with predictions, coping motives moderated intervention effects on drinking. Specifically, students with higher coping motives scores who received feedback subsequently decreased their drinking. The effect size was in the medium range (Cohen, 1992) and was much larger than that seen among those with lower coping motives scores at the two follow-ups, providing initial evidence of its potential clinical significance. However, when examining alcohol-related consequences, a significant interaction did not emerge.

In sum, the present data suggest that coping motives moderate PNF efficacy for drinking, but not alcohol-related consequences. It is worth noting that the intervention did not significantly reduce alcohol-related problems overall (Neighbors et al., 2004), which is not atypical for brief interventions (e.g., Collins et al., 2002; Larimer et al., 2007; Walters et al., 2007). Individuals who drink to cope may require a more intensive intervention tactic (e.g., cognitive-behavioral therapy) that focuses on their motivations for drinking.

In addition, PNF may reduce drinking among individuals scoring high in coping motives because these individuals reduce their drinking for other motivations (e.g., social or conformity reasons) and instead drink primarily for coping reasons. This would lead to a reduction in drinking overall, but not necessarily a reduction in problems. Future research may wish to examine mechanisms through which coping drinking leads to alcohol-related problems to better understand how interventions can help reduce problems among these individuals.

Subsequent analyses indicated support for coping motives as a moderator of intervention efficacy independent of perceived norms. PNF provides two discrepancies: one that focuses on a deviation in normative perceptions and one that focuses on a deviation in drinking behavior (Lewis & Neighbors, 2006). The current findings suggest that the latter

discrepancy may be important to consider for those scoring higher in coping motives.

PNF highlights that heavy drinkers drink more than the typical student, which may be of particular importance for those who drink for coping reasons. Specifically, individuals who drink to cope may perceive the discrepancy between their drinking and others' drinking as an indicator of their drinking being problematic and may alert them that their coping style is unhealthy.

Importantly, coping motives moderated PNF efficacy after controlling for other drinking motives. Moreover, with all motives included, only coping motives moderated PNF efficacy. This is compelling, considering previous work has focused on social factors as moderators of this intervention (e.g., Neighbors et al., 2004). Perhaps once coping-motivated drinkers recognize that their drinking is non-normative, they are prompted to change their behavior.

Limitations and future directions

The present study has some limitations and related future directions that warrant comment. First, by design, the studied participants were not a representative sample of the population as a whole, but rather a largely homogenous, age-limited, self-selected sample from a university. Thus, the generalizability of the findings is limited. Second, a related sampling concern is that the studied sample was not administered a structured interview. As such, we could not document the nature of psychopathology generally or the extent to which the participants met criteria for abuse or dependence specifically.

Third, we oriented the study of formative "next steps" in the PNF-motivation literature by evaluating a moderational model for a select number of outcome variables. Future work could extend the types of relations tested by including other theoretically relevant variables. As one illustrative example, it may be advisable to explore linkages between coping motives in the context of PNF and the nature of subsequent quit behavior, reasons for quitting, and perceived barriers for quitting.

Fourth, self-report measures were used as the primary assessment methodology, which are susceptible to reporting errors and may be influenced by shared method variance. Finally, because coping motives moderated the effect of the intervention on drinking behavior, future studies could include measures of emotion regulation, as a lack of emotion regulation strategies can provide a strategic point of intervention for those who drink to cope with negative affect.

Conclusions

These results highlight the importance of understanding coping drinking motives, especially in terms of interventions to reduce heavy drinking among college students. The pres-

ent findings suggest that focusing on coping motives may be useful for identifying young adults—and presumably others—who can benefit from PNF approaches. Furthermore, PNF may influence future drinking behavior through mechanisms other than changes in perceived norms. Future investigations could examine other pathways through which PNF may reduce drinking.

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