Short communication

Negative affect words prime beer consumption in young drinkers

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Abstract

Negative affect is consistently associated with pathological aspects of alcohol use. Priming of motivation for alcohol by negative affect cues may contribute to this relationship. This study sought to determine whether: (a) exposure to negative affect words primes actual drinking behavior; (b) this effect is related to severity of alcohol problems; and (c) these effects are moderated by gender and anxiety sensitivity. Prime words (negative, positive, neutral) were administered using a synonym generation task. Primed drinking behavior was measured in a taste-test procedure, using placebo beer. Drinking scores were significantly greater in the negative affect condition than in the other two conditions, which did not differ from each other. Problem drinking severity directly predicted priming effects of negative affect words but was unrelated to drinking in the other two word prime conditions. Anxiety sensitivity was unrelated to drinking in any condition. Even unobtrusive exposure to negative affect cues can prime drinking behavior in young drinkers, and this effect is tied to the severity of alcohol problems.
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1. Introduction

Negative affective states are widely implicated in pathological aspects of alcohol use. Drinking in response to negative affect is consistently associated with alcohol problems in young drinkers (e.g.,

Carey & Correia, 1997). Implicit associative tasks can be used as a sensitive index of motivational processes. For example, Weingardt, Stacy, and Leigh (1996) found that alcohol expectancy words (e.g., relaxed) primed alcohol targets on a semantic priming task in social drinkers, and such words have also been used to prime actual drinking behavior (Stein, Goldman, & Del Boca, 2000). In a recent study, we found that negative affect words prime alcohol words on a semantic priming task and this effect correlated directly with severity of alcohol problems (Zack, Poulos, Fragopoulos, & MacLeod, 2003). These findings raise the possibility that negative affect words activate a motivational system for alcohol, and promote drinking behavior.

The present study used the synonym generation task to determine if processing of negative affect words will increase beer consumption in an ostensibly unrelated taste test procedure in young drinkers. Based on our initial study, severity of alcohol problems should predict the degree to which negative affect words promote beer consumption. The effects of gender and anxiety sensitivity, two possible moderators of reactivity to negative affect cues (cf. Samoluk & Stewart, 1998), were also assessed.

2. Method

2.1. Overview of design and methodology

The study employed a 2 (Gender) × 3 (Prime Condition: Negative Affect, Positive Affect, Neutral), between-subjects, factorial design. Participants were pre-screened and matched on gender and weekly alcohol use and randomly assigned to one of the three prime conditions.

The procedure conforms very closely to that of Stein et al. (2000). Briefly, eligible students were contacted by telephone and invited to take part in a study of 'verbal styles'. To minimize experimental demand, the drinking phase was presented as a separate experiment, and was not introduced until the participant had already undergone the prime manipulation. Participants completed the synonym generation task and were told that there would be a half-hour wait before some follow-up measures were taken. The participant was told that there had been a cancellation in another study and asked if s/he would be willing to fill the cancelled time slot. The second study was described as a taste-rating survey of commercial beverages, and was carried out in a separate part of the building. De-alcoholized beer was used to avoid the need for a potentially disruptive pregnancy screen when testing females (cf. Roehrich & Goldman, 1995).

2.2. Participants

The final sample consisted of 69 (42 female) first-year undergraduates, ages 19ã30 ($M = 19.6$, S.D. = 1.5) years, from an Introductory Psychology class at the University of Toronto. They received $25 upon completion of the synonym generation phase and $10 after the taste test.

2.3. Apparatus and materials

2.3.1. Self-report scales
The Personal Drinking Questionnaire (PDQ; Vogel-Sprott, 1992) measured typical alcohol use. The Alcohol Use Disorders Identification Test (AUDIT; Saunders, Aasland, Babor, de la Fuente, & Grant,

1993) assessed problem drinking. The Anxiety Sensitivity Index—Revised (ASI; Peterson & Reiss, 1992) measured anxiety sensitivity. The Positive and Negative Affect Scales (PANAS; Watson, Clark, & Tellegen, 1988) assessed these affect states during the test session.

2.3.2. Prime manipulation: the synonym generation task

The study employed three lists of words, negative affect (e.g., Anxious), positive affect (e.g., Happy), and neutral (e.g., Frequent). Each list contained 15 words (full list of words available from MZ). Participants were instructed to read each word in their assigned list carefully, to generate one synonym for each word, and to write the synonym in the space provided next to each word. As far as possible, items were matched on first letter, number of syllables, frequency of occurrence in print and concreteness to control for these potential moderators of memory activation.

2.3.3. Materials for taste rating task

Participants received three 12-oz plastic cups of commercially available de-alcoholized beer (total volume: 36 oz or 1065 ml) labeled A, B, and C, with each containing a different beer. They received three rating sheets, one for each beer, listing a number of qualities (e.g., degree of carbonation, balance of dryness/sweetness, etc.) for their evaluation. Sampling lasted for 10 min. After participants had left the taste-rating laboratory, the volume of beer remaining was confirmed to the nearest ml.

2.4. Procedure

Testing was carried out individually between the hours of 12 and 6 pm. Participants completed two consent forms: one for each phase of the study. They were debriefed upon completion, with additional information provided by mail (cf. Roehrich & Goldman, 1995).

During debriefing, participants were queried to determine the effectiveness of the deception. In line with Roehrich and Goldman (1995), no participant indicated perceiving or wondering about a relationship between the prime and drinking phases.

3. Results

3.1. Participant characteristics and self-reported state affect

There were no significant differences in participant background characteristics as a function of prime condition apart from AUDIT, which was higher ($p < 0.05$) in the Negative Affect Condition—Males ($M = 10.7$; S.D. $= 6.1$) than in the Positive Affect Condition—Males ($M = 6.8$; S.D. $= 5.8$) or Neutral Condition—Males ($M = 5.3$; S.D. $= 3.1$).

Mean (S.D.) scores for the sample were as follows. Age: 19.6 (1.5) years; Anxiety Sensitivity: 23.3 (12.3); AUDIT: 7.1 (4.8), Years Drinking Alcohol: 2.5 (1.9); Alcohol Dose/Occasion: 1.2 (0.7) ml/kg (~5 drinks for 70-kg male; ~4 drinks for 55-kg female); Weekly Drinking Frequency: 1.3 (2.6); Duration of Drinking Occasion: 2.3 (1.9) h; PANAS—Positive Affect: 29.3 (6.6); PANAS—Negative Affect: 13.8 (3.6).

3.2. Taste-test beer consumption

3.2.1. Mean scores

A 2 (Gender) × 3 (Prime Condition) ANOVA of beer consumption scores yielded a main effect of Gender, $F(1, 68) = 23.94$, $p < 0.001$, and a main effect of Prime Condition, $F(2, 68) = 3.87$, $p < 0.05$. The interaction did not achieve significance, $p > 0.056$. The main effect of Gender reflected significantly greater mean beer consumption in males ($M = 271$; S.D. = 199 ml) than in females ($M = 109$; S.D. = 76 ml). Planned comparisons, using Dunnett's test, revealed that the main effect of Prime Condition involved significantly greater beer consumption (ml) in the Negative Affect ($M = 251$; S.D. = 220) than in the Neutral Control ($M = 161$; S.D. = 145) condition, $p < 0.05$. By contrast, there was no significant difference in consumption between the Positive Affect ($M = 143$; S.D. = 99) and the Neutral Control condition, $p > 0.80$. (A 2 × 3 ANCOVA of beer consumption scores, with AUDIT as the covariate, yielded the identical pattern of significant simple effects).

Beer consumption (ml) was greatest in the Negative Affect condition in males ($M = 378$; S.D. = 234) and females ($M = 123$; S.D. = 106). However, in males, Positive Affect was associated with relatively less drinking ($M = 179$; S.D. = 141) than Neutral Control ($M = 238$; S.D. = 164) whereas in females, Positive Affect was associated with relatively more drinking ($M = 117$; S.D. = 65) than Neutral Control ($M = 90$; S.D. = 63). This differential pattern would appear to explain the marginal Gender × Prime Condition interaction in the ANOVA.

3.2.2. Regression analyses

In each prime condition, standard multiple linear regression analyses assessed the relationship between primed beer consumption (ml) and the predictors, AUDIT and ASI. As hypothesized, AUDIT scores significantly predicted beer consumption in the Negative Affect prime condition, $r = 0.46$, $p = 0.03$. In contrast, AUDIT was unrelated to beer consumption in the other two prime conditions, p values > 0.81. Thus, higher levels of problem drinking were associated with greater primed beer consumption, but only in the Negative Affect condition. Anxiety Sensitivity was unrelated to beer consumption in any condition, $p > 0.11$.

4. Discussion

As predicted, negative affect words significantly increased beer consumption relative to neutral control words. In contrast, positive affect words did not reliably prime beer consumption (although a trend in the pattern of means emerged in females). These findings are in line with our previous study, which found that verbal negative affective cues for drinking were more effective than positive cues in priming alcohol words on a semantic priming task (Zack et al., 2003).

In accord with our hypotheses, AUDIT scores were significantly positively correlated with beer consumption in the negative affect prime condition but not in the other two word prime conditions. In contrast to the clear and selective effects of AUDIT scores, there was no relationship between anxiety sensitivity and taste test beer consumption in any condition. The intimate linkage between negative affect and severity of addiction in this study is consistent with theoretical accounts, which assert that dysregulation of affect progresses in tandem with escalation in alcohol and drug use in general (Koob & Le Moal, 2001).

The present results suggest that automatic activation of alcohol concepts may be one process that mediates the linkage between negative affect drinking and alcohol problem severity.

Acknowledgements

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