Do we crave what the body needs? Cardiovascular threat predicts acute alcohol consumption after experiencing social stress

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Overview

The Biopsychosocial Model

- Stress leads to evaluation of personal resources versus perceived demands of the stressor (Seery, 2011)
  - Cardiovascular challenge = subjective resources to overcome situational demands (SAM-axis activation)
  - Cardiovascular threat = situational demands exceed subjective resources (SAM + HPA-axis activation)

Stress & Alcohol Use

- Stress facilitates problematic alcohol use (Bresin et al., 2018; Peltier et al., 2019) and may promote craving as a short-term coping strategy (Cooper, 1994)
- Whether alcohol use differs as a function of challenge versus threat appraisals has been scarcely explored

Cognitive Reappraisal

- Cognitive reappraisal facilitates challenge appraisals (Jamieson et al., 2012), potentially reducing HPA-axis activation and stress-induced alcohol consumption

Hypotheses

H1: Stress will elicit cardiovascular threat responses compared to control conditions (Experiment 1)

H2: Cognitive reappraisal will promote cardiovascular challenge compared to control conditions (Experiment 2)

H3: Cardiovascular threat will facilitate greater alcohol consumption (Experiments 1 and 2)

Materials

Cardiovascular Equipment

- ICG and ECG assessed via BN-NICO and BN-RSPEC wireless amplifiers (Biopac Systems; Goleta, CA)
- Blood pressure assessed via Omron M2 (Kyoto, Japan)

Trier Social Stress Test (TSST)

- Three 5-minute tasks to induce stress performed in front of two experimenters (i.e., preparation, interview, arithmetic; Kirschbaum et al., 1993)
- Control = read magazine for 15-minutes (Experiment 1)

Reappraisals Strategies

- Participants instructed arousal is not harmful but helps performance prior to the TSST (Jamieson et al., 2012)
- Control = ignore experimenters in TSST (Experiment 2)

Ad Libitum Taste Test

- Two cups containing ostensibly alcoholic beer provided, participants asked to determine if beers were identical

Data Preparation

- Challenge versus threat computed by subtracting standardised total peripheral resistance (TPR) from standardised cardiac output (CO) during speech
- Positive scores indicate challenge (high CO, low TPR), negative scores indicate threat (low CO, high TPR)

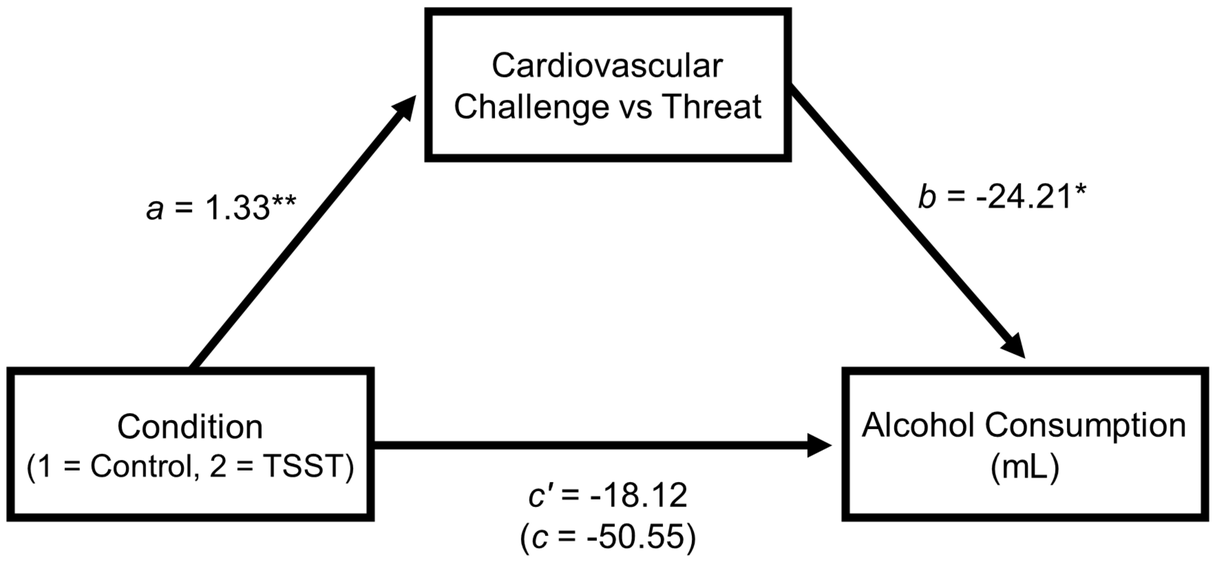
Experiment 1 (*N* = 55)

Cardiovascular Responses

- TSST promoted cardiovascular challenge (*M* = 0.68, *SD* = 1.84), while controls exhibited threat (*M* = -0.65, *SD* = 1.31), contrary to H1, *t*(53) = -3.10, *p* = .003.

Alcohol Consumption

- Consumption (mL) was consistent across conditions, *t*(53) = 1.40, *p* = .168.
- Cardiovascular threat among controls mediated alcohol consumption, b = -32.43, 95% CI [-64.95, -7.67].



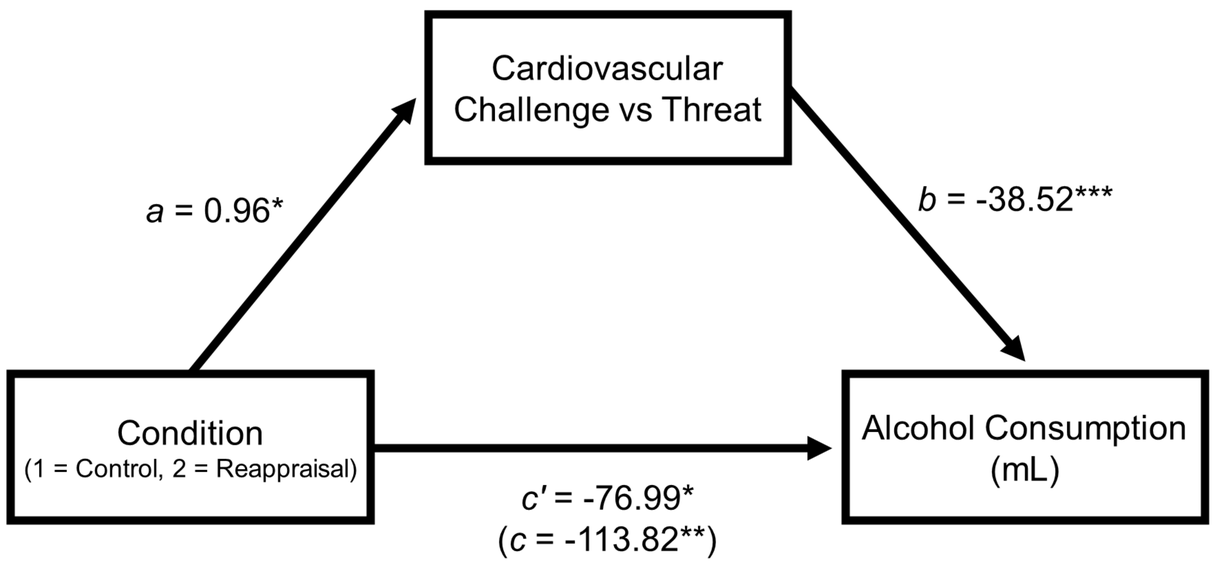
Experiment 2 (*N* = 72)

Cardiovascular Responses

- Reappraisal promoted cardiovascular challenge (*M* = 0.41, *SD* = 0.99), while controls exhibited threat (*M* = -0.55, *SD* = 1.86), supporting H2, *t*(70) = -2.31, *p* < .001.

Alcohol Consumption

- Reappraisal reduced alcohol consumption (*M* = 97.14, *SD* = 77.54) compared to controls (*M* = 188.92, *SD* = 147.04), *t*(52) = 3.29, *p* = .025.
- Cardiovascular threat among controls mediated alcohol consumption, b = -36.82, 95% CI [-71.02, -7.56].



Discussion

- Social stress promotes cardiovascular indicators of challenge (high CO, low TPR; Experiment 1)
- Cognitive reappraisal is effective in promoting challenge appraisals in response to stress (Experiment 2)
- Cardiovascular indicators of threat (low CO, high TPR) account for increased alcohol consumption
- Stress may only increase alcohol use when appraised as threatening (e.g., demands exceed resources)