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The Effect of Cognitive and Interpersonal Stressors on Eating Behavior

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ABSTRACT

Interpersonal stressors are especially effective at stimulating consumption of energy dense comfort foods, which may contribute to overweight or obesity. One reason that people slow or stop eating is by habituating to the food. Stress may also influence energy intake by acting as a dishabituator, but it is not known if mental arithmetic, Stroop task, and interpersonal speech stressors have different dishabituating properties. These tasks produce stress by different means; mainly, memory requirements, cognitive dissonance, and ego threat. The goal of this research was to test differences in the ability of cognitive and interpersonal laboratory stressors to dishabituate repeated presentations of a comfort food. For this study, twenty adult females each completed three appointments where they engaged in motivated responding to earn portions of macaroni and cheese. After 24 minutes, one of three stressors was presented. Motivated responding for macaroni and cheese was determined after the stressor (putative dishabituator). Participants slowed their responding across time. There was an increase in responding after the stressors, but preliminary analyses suggest no significant difference in dishabituating properties by type of stressors. This suggests that both cognitive and interpersonal stressors can dishabituate eating behavior and increase energy intake at a meal.

BACKGROUND & AIM

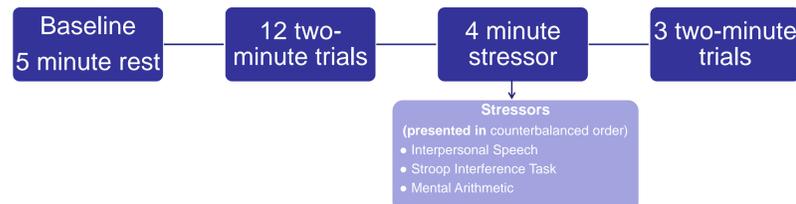
- Habituation is demonstrated by a decrement in responding to repetitions of the same stimulus, and then recovery of responding after presentation of a dishabituating stimulus.
- A dishabituating stimulus can resume motivated responding for the same food resulting in greater energy intake than otherwise would have occurred.
- The mental arithmetic, Stroop, and interpersonal speech tasks produce stress through memory requirements, cognitive dissonance, and ego threat; respectively.

Aim: To test differences in the ability of cognitive and interpersonal laboratory stressors to dishabituate motivated responding to repeated presentations of a comfort food.

METHODS & ELIGIBILITY

● **Inclusion Criteria:** Female, 18-30 yr, BMI > 18 kg/m². No history of diagnosed psychiatric disorder, no current illness or pregnancy, no current use of medications that would alter reactions to stress. Participants were instructed to refrain from consuming caffeine or engaging in intense exercise the day of the appointment and to avoid eating macaroni and cheese the day before the appointment.

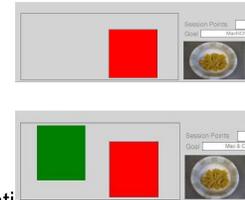
- **Experimental Sessions:** Each participant completed 3 appointments where they engaged in motivated responding to earn portions of macaroni and cheese.
- The order of presentation of stressors was counterbalanced across participants.
- Timeline for each session:



MEASURES

Motivated Responding

- Motivated responding was measured by total number of mouse clicks performed on the red square during one trial
- Each trial was 2 min ± 20 sec in duration. Duration varied at random by 20 sec.
- Participants told to click on the red square until a green square appeared. The green square = 1 point.
- 1 point = one 125 kcal portion of macaroni and cheese



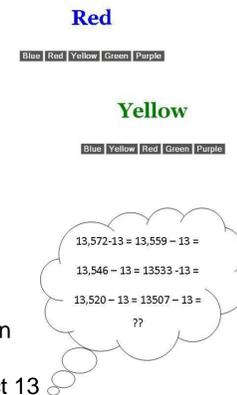
Dishabitutors (each 4 min in duration)

- Speech
 - Interpersonal stressor
 - Topic "Qualities that make you a good friend"
 - 2 min to prepare, 2 minutes to deliver speech
 - Participants informed speeches videotaped & judged based on:
 - Honesty, believability, confidence
 - Using voice analysis and analysis of non-verbal communication



Stroop Interference Task

- Cognitive stressor
- First 2 min participants hear words, second 2 minutes participants read words aloud
- Participants select font color but hear/say aloud written word



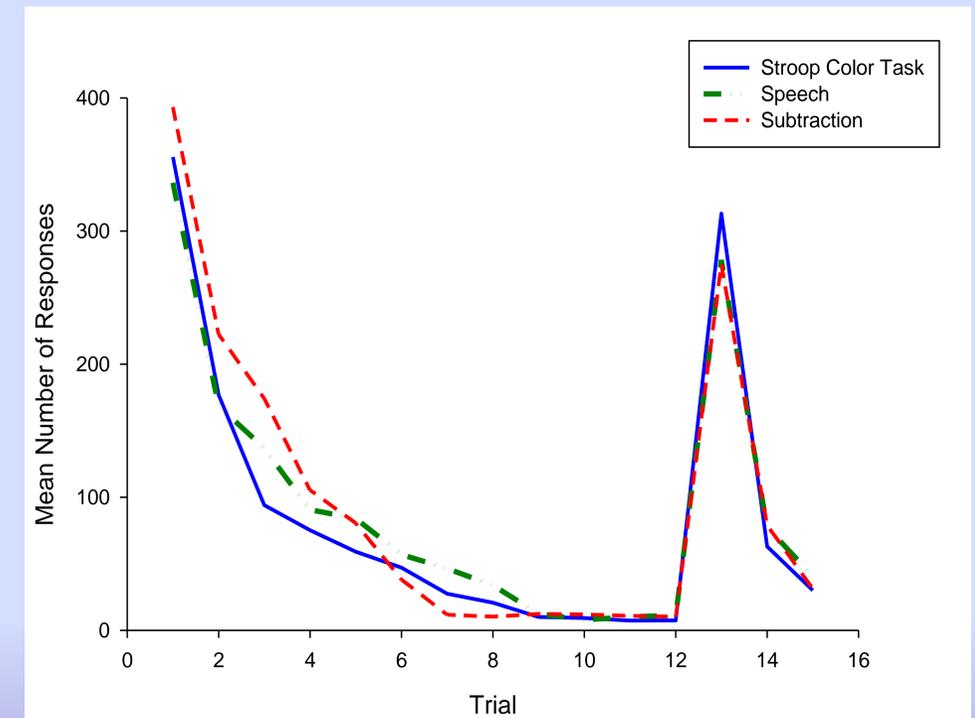
Subtraction

- Interpersonal and cognitive stressor
- Timed paper test (2 min) 4-digit subtraction
- Timed 2-min mental subtraction
 - Starting at 13,572 continuously subtract 13
 - Errors corrected

STATISTICS & RESULTS

- **Statistics:** One-way ANOVA models tested differences in demographics between participants. Two-way repeated measures ANOVA (visit day by trials) tested differences in rate of habituation across visits. Two-way repeated measures ANOVA (stressor by trials) tested differences in dishabituation across visits.
- **Results:** Participants slowed their responding across trials ($p < 0.04$), but there were no differences in rate of habituation across the 3 visit days. There was an increase in responding after the stressors with no significant difference in degree of dishabituation by type of stressor ($p > 0.3$).

Table 2. Mean number of responses per trial by type of stressor



PARTICIPANTS

Table 1. Characteristics of participants

	Females (N=20)
Age	22.1 ± 2.5
Height (cm)	165.3 ± 7.7
Weight (Kg)	68.6 ± 13.9
Body Mass Index (BMI)	25 ± 4.7

Data are mean ± SD.

CONCLUSIONS

- Results suggest that both cognitive and interpersonal stressors can dishabituate motivated responding for food and eating behavior, and can increase energy intake at a meal.

ACKNOWLEDGMENTS

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