

Repeated cue exposure effects on subjective and physiological indices of chocolate craving

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Abstract

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The aim of this study is to investigate the effects of repeated unreinforced exposure to chocolate cues in persons reporting chocolate craving.

Participants in the experimental group (n=40) received 10 consecutive brief exposures to chocolate cues in each of two sessions, separated by 1-3 days. Control participants (n=18) received two exposures at the start and end of each session. Chocolate craving was measured (alternately) through subjective report and the amount of saliva secretion to chocolate cues. Results showed a between-sessions decrease in both craving measures in the experimental group, whereas no differences in craving between sessions were observed in the control group. These results provide evidence for the effects of cue exposure treatment in chocolate craving.

Intro

- Hill & Heaton found that chocolate is most frequently craved among women, especially during their “perimenstruum” or their premenstrual cycle.
- Conditioning is strongly involved in the development of cravings.
- The moods and feelings associated during this cycle may become conditioned cues.
- Parker, Parker, & Brotchie revealed that consuming the chocolate actually prolongs a “dysphoric” mood.

Intro

- Zellner & Edwards' conditioning model of food craving is influential in the development of techniques to help reduce chocolate cravings.
- This has yet to be tested empirically, which is why this study is important.
- In this study, chocolate is presented to participants over two sessions and is measured in two ways.
 - subjective report
 - saliva secretion

Methods

Participants

- Recruited through questionnaire, administered to 335 students that labeled them as chocolate cravers
- Participants: 58 female psychology students at the University of Leuven, aged between 20 and 24
 - Experimental group: 40
 - Control group: 18
- All participants were voluntary

Methods

Measures

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Subjective report

- Question: “How strong is your craving for chocolate at this moment?”
- Self reported craving was measured using an online scale ranging from 0 (no craving) to 100 (extreme craving)
- During exposure participants rated their craving at any time but at least every time they heard a tone

Saliva Secretion

- Salivation was measured by weighing the amount of saliva absorbed by rolls of cotton before and after application to the mouth
- This amount was interpreted as an indicator of craving

Methods

Procedure

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- Experiment consisted of two 1-h sessions with 1-3 days between sessions
- Participants were instructed not to eat or drink coffee 3h prior to the sessions and to abstain from chocolate or candies 24 hours prior to the sessions.
- Participant chocolate preference was collected and used for cue exposure
- Experiment also implied mood induction manipulations to explore if craving would generalize to different mood contexts
- **Positive and Negative Affect Schedule Scales:** used measure emotional changes
- The mood manipulations did not yield the intended effects and mood-related aspects will not be discussed further

Methods

Procedure Continued...

Session 1

- Consent form, biographical questionnaire, PANAS Scale
- Exercise trial with cotton rolls & base secretion collected
- Following BS measurements participants were exposed to chocolate for the first time
- Trial duration: 27 minutes
 - Participants first looked at the chocolate for 30s
 - Participants then held chocolate for 30s
 - Followed by 1m of smelling
- Craving during the first exposure trial was measured by the online scale
- The second exposure trial lasted 1m and then film fragments were shown followed by four exposure trials.
- Cravings were measured alternately by means of cotton and online scale
- Next the same film fragments were presented and followed by another four cue exposure trials
- The last trial lasted for 10 minutes (9m of constant smelling, with a tone probing for online craving)

Session 2

- Similar to the first session except participants were presented both positive and negative movie clips. The last exposure trial lasted only 2 minutes

Methods

Procedure Continued...

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Control Group

- Participants in the control group were treated the same way as participants in the experimental group
- Except that they only received the exposure to chocolate at the beginning of each session and at the end
- Their cravings were measured in the same way as the experimental group at the other trials

Results: Online Craving Scores

- Experimental Group

- In the experimental group, the observation was that there was no decrease in craving from start to end in session 1, and even an increase in session 2.
- From the beginning of the experiment to the end there was a significant decrease in reported craving.

- Control Group

- In the control group, the observation was that there was an increase in reported craving in session one and in session 2.
- From the beginning of the experiment to the end a significant increase in reported craving was observed

Results: Amount of Salvation

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- Experimental Group
 - A marginally significant decrease from session 1 to session 2 for the experimental group
- Control Group
 - No difference between session for the control group.
 - Similar to the online craving data, the mean amount of saliva secreted in session 2 was lower than in session 1 in the experimental group but not in the control group.

Results

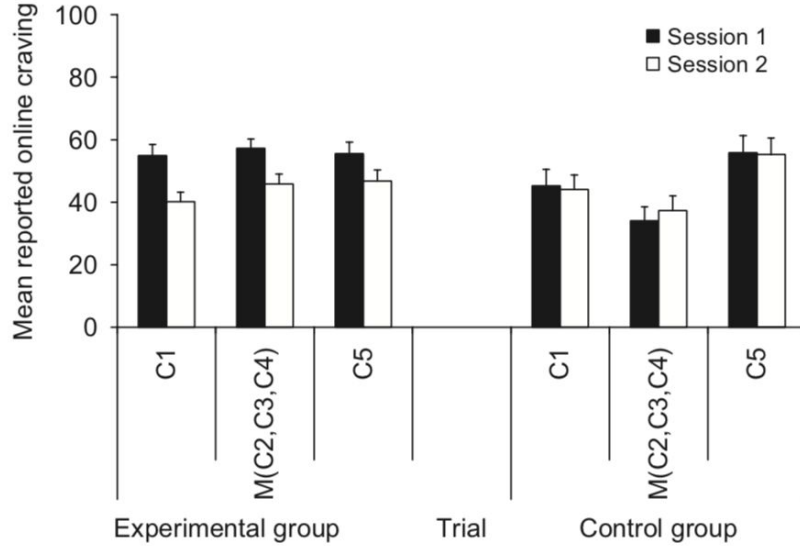


Fig. 1. Mean chocolate craving scores on the online scale ranging from 0 (*no craving for chocolate at all*) to 100 (*extreme craving for chocolate*) (+SE) for the experimental and control group, by session and trial, with C1 = first online craving measure; $M(C2,C3,C4)$ = the mean of the trials C2, C3 and C4; C5 = last online craving measurement.

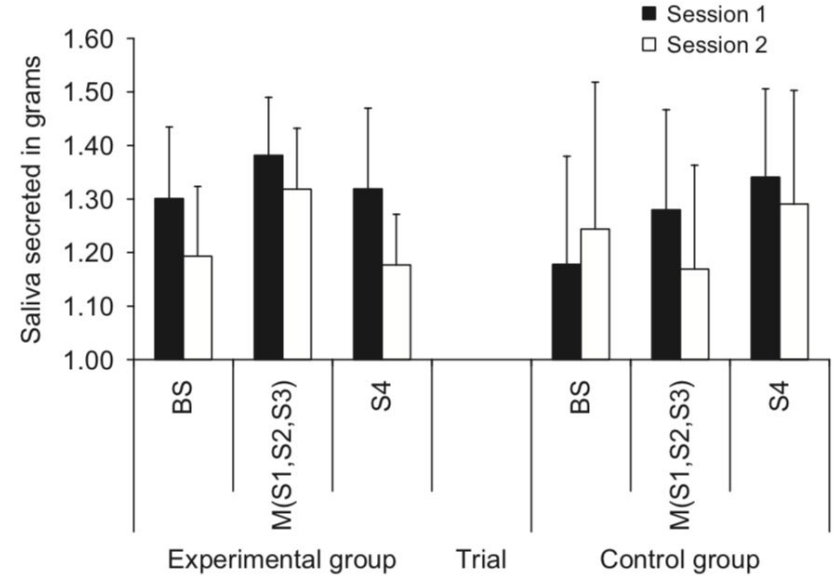


Fig. 2. Mean amount of saliva secreted in grams (+SE) for the experimental and control group, by session and trial, with BS = baseline saliva; $M(S1,S2,S3)$ = the mean of the trials S1, S2 and S3; S4 = last salivation measurement.

Discussion

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- Cue-exposure manipulation is effective
- Validity of subjective craving results
- Data reflective of the conditioning model
 - However...
 - Impact of expectation of chocolate
 - Short duration of experiment
- Efficacy of cue exposure for treatment of addictions

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