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Short communication

Resisting temptation: Effects of exposure to a forbidden food on eating behaviour

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Abstract

The study tests existing evidence on the paradoxical effects of exposure to a forbidden snack. Sixty-eight females were assigned randomly to one of two conditions: a *temptation group*, who were given the instruction to abstain from a favourite snack for 24 h while being exposed to it, or a *control group*, who were given no specific instructions. A further distinction was made between high-restraint/high-disinhibition ($n = 21$), high-restraint/low-disinhibition ($n = 20$) and low-restraint participants ($n = 27$) based on DEBQ subscale scores. After exposure to the foods, all participants were given free access to the food. Participants ate more of the snack after abstinence with exposure. The high-restraint/high-disinhibition group in particular displayed a substantial disinhibition effect. Results indicate that prohibition with exposure may backfire and increase the risk of loss of control over eating behaviour, particularly in at-risk groups of disinhibited restrained eaters.

Keywords: Exposure; Dietary restraint; Disinhibition

Introduction

Although a causal link between dietary restraint and overeating is a core assumption in dietary restraint theory (DRT, Herman & Mack, 1975), naturalistic research on the direct effects of prohibition on eating behaviour is scarce. In a study by Stirling and Yeomans (2004), participants were exposed to chocolate for 24 h while being prohibited from eating it. In a subsequent taste test, this temptation group ate more chocolate than a non-temptation control group. Restrained eaters also ate more than the unrestrained eaters, but no interaction effect was found. In the current study, we aimed to replicate and extend the work of Stirling and Yeomans (2004) by taking into account the participants' food preferences and by differentiating subtypes of restrained eaters, in line with recent insights by Westenhoefer, Broeckmann, Munch, and Pudel (1994).

Westenhoefer et al. (1994) have established that disinhibition effects occur only in high-restraint/high-disinhibition participants (disinhibited restrainers) and not in high restraint/low-disinhibition participants (inhibited restrainers). They thereby question the assumption that dietary restraint is the key and sole precursor of dieting failures and suggest that disinhibition plays an equally important role. The term disinhibition is used to refer to a tendency to overeat in a variety of situations (Westenhoefer et al., 1994). Other studies have echoed the vulnerability of disinhibited restrainers to disinhibition effects (Ouwens, Van Strien, & Van der Staak, 2003). To our knowledge, the impact of disinhibition on overeating after prohibition has never been tested.

In this study, it is hypothesized that after an experimentally manipulated 24 h abstinence with exposure to a 'forbidden' snack, an overall rebound effect in eating behaviour will be observed, which will be most pronounced for disinhibited restrainers.

Methods

Participants

Seventy-three university students voluntarily took part in the experiment. Five participants were excluded from the analyses because of incomplete data and to balance the design. All participants ($N = 68$) were female and between the ages of 18 and 24 years ($M = 20.69$, S.D. = 1.55), with a mean body mass

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index [BMI = weight in kg/(height in m)^2] of 21.20 (S.D. = 2.20). A prior history of eating disorders and diabetes were regarded as exclusion criteria.

Measurements

Dutch eating behaviour questionnaire (DEBQ)

The DEBQ (Van Strien, Frijters, Bergers, & Defares, 1986) was administered as a measure of dietary restraint and disinhibition. The DEBQ is a 33-item questionnaire that taps three characteristics of eating behaviour: restrained eating (10 items), emotional eating (13 items) and external eating (10 items). By calculating the mean of the scores of the latter two subscales, a DEBQ measure for disinhibition was obtained (Ouwens et al., 2003). The DEBQ consists of a five-point Likert scale with categories ranging from 'never' (1) to 'very often' (5). Both reliability and validity have been proven to be adequate (Van Strien et al., 1986). Cronbach's α in the present study amounted to 0.94 for restrained eating, 0.90 for emotional eating and 0.68 for external eating.

Profile of mood state (POMS)

The Dutch version of the shortened POMS (Wald & Mellenbergh, 1990) was used to measure different aspects of affect (a total of four times, see Procedure). The questionnaire consists of 32 items, each referring to a particular mood state. Participants are asked to rate, on a five-point rating scale, how well the target mood describes their current mood state. Scores range between 'not at all' (0) and 'very well' (4). Both validity and reliability of the scale are reported to be sufficient (Wald & Mellenbergh, 1990). In the present study, Cronbach's α ranged between 0.86 and 0.89.

Measure of consumption

The snacks used in the experiment were weighed (in g) before and after exposure to the food with a professional, sensitive balance (Wedo Accurat 2000). Consumed food was taken as dependent variable.

Intention check questionnaire (ICQ)

Participants were questioned about their thoughts about the goals of the experiment.

Procedure

The procedure is an adjusted version of the procedure by Stirling and Yeomans (2004), approved by the University Ethical Committee. Two weeks prior to the experiment, participants were questioned about their most tempting snack. Each participant's favourite snack was purchased and used throughout the experiment.

The experiment itself comprised of two consecutive testing days. Participants were given individual appointments with 24 h between testing periods. They were asked not to eat for the 2 h immediately prior to testing. For each participant allocated to the temptation condition ($n = 34$), another participant with a similar food choice was immediately thereafter allocated to the control condition ($n = 34$). This way, the type of food was balanced across temptation conditions and the type of temptation condition was balanced across testing times.

On day 1, all participants signed a letter of informed consent and were told that the experiment comprised of two studies interested in measuring food preferences (day 1) and the perception of emotions (day 2). All participants rated their baseline feelings of hunger (seven-point Likert scale) and affect (POMS-1). Information about age, weight and height was also obtained. Participants then were given one piece of their favourite snack and were asked to taste it and answer a set of questions regarding the snack. Participants in the control condition were given an appointment for the next day and left. Participants in the temptation condition were given a 24 h-avoidance instruction and a small bag to wear around the hips. Inside this bag were: a transparent plastic sack containing a pre-weighed amount of the customized favoured snack and an alarm clock. They were instructed to wear the bag at all times and to try to *avoid* the snack during the whole 24 h, by not eating it and by trying not to think about it. Also, they were not allowed to eat that particular kind of snack under any other circumstance (e.g. buying it themselves).

The purpose of the alarm clock was to standardize exposure to the food (four times in total, with a 3-h time gap). It was made clear that every time the alarm sounded, participants had to take the snack out of the bag and to take a couple of minutes to smell it, count the pieces, etc. Participants' motivation for wearing the bag was questioned and potential difficulties were talked through.

On day 2, all participants completed a POMS (POMS-2) and rated their current level of hunger. Participants in the temptation and control condition were then asked to watch a film fragment and complete a POMS (POMS-3). Just before pressing the 'start' button, each participant was given their favourite snack. This snack was pre-weighed and was left in its open packing within reach of the participant. To ensure standardization, all participants were given approximately 150 g. Participants were casually told that the snacks were leftovers from the previous day and since they were the only ones that had chosen that snack as their favourite snack, the snack would be thrown away, unless ''the participant wanted some''. The experimenter then left the room. After the film fragment, the experimenter returned and music was played. Again, participants were asked to complete a POMS (POMS-4).[1] The experimenter made sure that the snack was still within reach by casually noticing that the snack 'indeed looked good'. After 10 min, the experimenter

[1] The visual and auditory load, were part of a two-phased mood induction, in order to prolong exposure time to the snack. Participants either received a negative mood induction (Bambi, fragment of mother deer dying; and ''Russia under the Mongolian Yoke'' by Prokofiev, recorded at half-speed) or a neutral mood induction (film fragment of nature documentary about hyraxes; and ''Pocket Calculator'' by Kraftwerk). Both pieces of music were repeatedly played for a 10-min time period. Since the mood induction did not affect the main outcomes of the study whatsoever, the results fell without the reach of this short communication. To obtain these additional results, please contact the authors.