



Violation of eating expectancies does not reduce conditioned desires for chocolate



Karolien van den Akker*, Myrr van den Broek, Remco C. Havermans, Anita Jansen

Faculty of Psychology and Neuroscience, Department of Clinical Psychological Science, Maastricht University, P.O. Box 616, 6200 MD Maastricht, The Netherlands

ARTICLE INFO

Article history:

Received 9 October 2015

Received in revised form

28 January 2016

Accepted 2 February 2016

Available online 4 February 2016

Keywords:

Appetitive conditioning

Instructed extinction

Extinction

Spontaneous recovery

Expectancy violation

Cue exposure therapy

ABSTRACT

Although eating desires can be easily learned, their extinction appears more difficult. The present two-session study aimed to investigate the role of eating expectancies in the short and longer-term extinction of eating desires. In addition, the relationship between eating desires and conditioned evaluations was examined to test whether they might share a similar mechanism. It was hypothesized that the short-term extinction of eating desires would be more successful after the disconfirmation of eating expectancies (instructed extinction or IE), while resulting in worse longer-term extinction because omission of the food reward during extinction is not surprising. In contrast to the hypotheses, it was found that IE had no effect on the short-term and longer-term extinction of eating desires. Eating desires correlated with conditioned evaluations only to some extent. It is concluded that eating expectancies do not mediate the short-term extinction of conditioned eating desires. In addition, their longer-term extinction does not appear to be facilitated by a greater violation of eating expectancies. This suggests that it might not be necessary to focus on expectancy violation in cue exposure therapy to reduce eating desires.

© 2016 Elsevier Ltd. All rights reserved.

1. Introduction

Obesity prevalence has increased substantially over the last decades, most western countries now reporting approximately 10–35% of their adult population to be obese (Berghofer et al., 2008; Ogden, Carroll, Kit, & Flegal, 2014). One important contributor to obesity is the “obesogenic” environment, in which omnipresent food cues signal the availability of palatable, high-calorie foods. Exposure to these cues can elicit physiological and psychological reactions, including an increased desire to consume the food (Jansen, 1998). These cue-elicited eating desires are thought to stimulate overeating and weight gain (Fedoroff, Polivy, & Peter Herman, 2003; Jansen, Havermans, & Nederkoorn, 2011), and appear heightened in overweight individuals and in those with eating psychopathology (Ferriday & Brunstrom, 2011; Jansen et al., 2003; Karhunen, Lappalainen, Tammela, Turpeinen, & Uusitupa, 1997). This highlights the need for investigating the etiology of cued eating desires, as well as finding ways to effectively tackle them.

It is thought that learning processes play an important role in cue-elicited eating desires. For instance, the sight and smell of food are thought to have become conditioned stimuli (CSs) predictive for food intake (unconditioned stimulus or US) through repeated CS-US pairings (Jansen, 1998). As a result, a CS (food cue) can elicit conditioned appetitive responses (CRs) such as a heightened desire to eat, increased salivation, and an explicit eating expectancy. Moreover, learning theory predicts that these CRs extinguish after repeated exposures to the CS alone. Thus, theoretically, after repeated exposure to the sight and smell of palatable food without consumption, conditioned responses such as desires to eat should decline. Such successful extinction of responses to food cues is thought to increase one's ability to abstain from eating, and ultimately, result in improved weight loss success (Jansen, 1998; Jansen et al., 2011; Jansen, Stegerman, Roefs, Nederkoorn, & Havermans, 2010; Wardle, 1990). In support, the few studies conducted on cue exposure therapy (CET), in which overweight individuals or those with eating psychopathology are repeatedly exposed to food cues without eating, indeed suggest CET to be effective in reducing cue-elicited cravings and eating binges (e.g., Boutelle et al., 2014; Jansen, Broekmate, & Heymans, 1992; Jansen, Van Den Hout, De Loof, Zandbergen, & Griez, 1989; Martinez-Mallén et al., 2007; Schyns, Roefs, Mulkens, & Jansen, 2016; Toro et al., 2003). Despite

* Corresponding author.

E-mail address: karolien.vandenakker@maastrichtuniversity.nl (K. van den Akker).

these very promising findings, the evidence for a superiority of CET over control treatments at follow-up is mixed (Boutelle et al., 2014; Jansen et al., 1992). Since CET is rooted in learning theory, it might be optimized by studying the mechanisms that underlie the (long-term) extinction of appetitive responses to food cues.

Extinction can be studied using conditioning paradigms, in which cue-elicited eating desires and eating expectancies are first established by repeatedly pairing a cue (CS) with a US (food) (e.g., Bongers, van den Akker, Havermans, & Jansen, 2015; Van den Akker, Havermans, Bouton, & Jansen, 2014; Van Gucht, Vansteewegen, Van den Bergh, & Beckers, 2008a). This acquisition phase is followed by an extinction phase, during which repeated CS - no US pairings occur. Findings suggest that eating desires can be quickly acquired, but only when a participant is consciously aware of the CS-US contingency (i.e., when reporting heightened US expectancies upon CS presentation) (Van den Akker, Jansen, Frentz, & Havermans, 2013). Thus, during acquisition, US expectancies are likely essential for developing cued eating desires. During extinction however, the two responses can diverge: even when eating expectancies reduce, eating desires can remain heightened (Van Gucht, Vansteewegen, Beckers, & Van den Bergh, 2008b). These divergent extinction patterns suggest an involvement of separate response systems that are differentially affected by extinction. Specifically, it may be that eating expectancies relate more to an anticipatory response system, preparing the organism for an incoming stimulus (Van Gucht, Vansteewegen, Van den Bergh, & Beckers, 2008b). In contrast, regarding the desire to eat, it has been noted that its resistance to extinction resembles extinction in evaluative conditioning: conditioned evaluations do not extinguish easily as well (Baeyens, Crombez, Van den Bergh, & Eelen, 1988; Van Gucht et al., 2008b). It might be that CS evaluations are based on the mere activation of the US representation in memory, i.e., reflecting a mere referential learning in which the CS “makes one think of” the US in the absence of actual eating expectancies (Hermans, Vansteewegen, Crombez, Baeyens, & Eelen, 2002; Baeyens, Eelen, Crombez, & Van den Bergh, 1992). This activation of the US representation could also be sufficient for experiencing heightened eating desires (Van Gucht, Baeyens, Vansteewegen, Hermans, & Beckers, 2010). Extinction may have more impact on response systems that prepare an individual for an incoming stimulus than on systems that are based on the mere activation of the US representation in memory (Van Gucht et al., 2008b; see also Luck & Lipp, 2015; Sevenster, Beckers, & Kindt, 2012), causing eating desires and CS evaluations to extinguish more slowly than US expectancies.

However, there is also evidence suggesting a closer relationship between expectancies and eating desires during extinction. For instance, although it indeed seems difficult to completely extinguish cue-elicited eating desires, their extinction *can* be achieved to a certain extent (Van den Akker et al., 2014; Van den Akker et al., 2015). This pattern is, in fact, very similar to the extinction of US expectancies: although expectancies diminish, they usually do not show complete extinction either (Van den Akker et al., 2014; Van den Akker et al., 2015; Van Gucht et al., 2008b). In addition, in a conditioning study conducted in smokers, explicit disconfirmation of acquired US expectancies (i.e., “instructed extinction” or IE) immediately eliminated cue-elicited craving for cigarettes, suggesting that expectancies acted as a mediator for cue-elicited cigarette craving (Field & Duka, 2001). Thus, it seems possible that the lack of complete extinction of eating desires during extinction in previous studies was caused by a lack of complete extinction of eating expectancies, rather than by the involvement of separate response systems. A complete and immediate elimination of acquired eating expectancies by IE can help determine how closely food cravings and US expectancies are related: if

conditioned cravings were to disappear immediately after CS-US disconfirmation, this would provide evidence for a mediating role of expectancies in the extinction of eating desires, and against the involvement of different response systems. Conversely, if conditioned cravings remain heightened despite an elimination of expectancies, this would provide evidence against a mediating role of expectancies in the extinction of eating desires, and would provide additional support for the idea of different response systems underlying the extinction of US expectancies and conditioned desires.

Extinction performance during one experimental session does not need to be predictive for longer-term extinction learning. New memories require time to consolidate (McGaugh, 2000), which is why actual learning is best tested at a later point in time. In case of IE, one could expect worse longer-term extinction learning, despite a possibly better short-term extinction performance. One reason for this might be the altered degree of “surprise” of non-occurrence of the US during extinction. Surprise, or violation of US expectancies, is thought to play a major role in (extinction) learning: a smaller discrepancy between expected and actual occurrence of the US should result in poorer (inhibitory) learning (Craske, Treanor, Conway, Zbozinek, & Vervliet, 2014; Rescorla & Wagner, 1972). After IE, the US omission that occurs during extinction is not very surprising, therefore possibly resulting in worse longer-term extinction learning. This would have implications for cue exposure therapy. If a reduction in US expectancies prior exposure (extinction) sessions results in worse extinction learning, cue exposure therapy might benefit from maximizing these expectancies prior to an exposure session – i.e., heightening expectancies for the US (eating) to occur.

The primary aim of the present study was to evaluate the role of US expectancies in the short and longer-term extinction of conditioned eating desires. To examine this, extinction performance in an IE condition (i.e., receiving explicit disconfirmation of the acquired CS-US contingencies before extinction) was compared with a “normal” extinction condition (no extinction instructions) on two subsequent days. It was expected that IE would speed up the short-term extinction of eating desires relative to a normal extinction procedure, while resulting in worse extinction learning, as reflected by a greater spontaneous recovery (the recovery of responding that occurs after the mere passage of time) (Pavlov, 1927; Rescorla, 2004) and slower re-extinction during test after a 24 h delay. Alternatively, it may be that eating desires are more closely related to evaluations of the CS rather than to US expectancies because they may share a similar mechanism. To examine this possibility conditioned CS evaluations were measured before and after each extinction session, and correlations between US expectancies, eating desires, and CS evaluations were assessed.

2. Methods and materials

2.1. Participants

48 participants took part in the study, of which two participants were replaced by additional participants because they did not show awareness of the CS-US contingency (i.e., they did not report clear differential US expectancies towards the end of acquisition), and one other participant because she did not show up for the second session. Participants were eligible to participate in the study if they were 1st or 2nd year undergraduate female students, between 17 and 25 years old, proficient in Dutch, and had indicated to like chocolate. Further, care was taken that no participant had previously participated in an appetitive conditioning study. To standardize hunger, participants were instructed to have a small meal two hours prior to each session and to refrain from consumption thereafter (only the drinking of water was allowed). As a cover

Download English Version:

<https://daneshyari.com/en/article/7307470>

Download Persian Version:

<https://daneshyari.com/article/7307470>

[Daneshyari.com](https://daneshyari.com)