



## Research report

## Good mood food. Positive emotion as a neglected trigger for food intake



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## ABSTRACT

Research on emotions as a trigger for food intake has mainly been focused on the role of negative emotions. In the present studies the role of positive emotions as a trigger for food intake is investigated in a sample of healthy participants with a normal weight. Two laboratory studies were conducted in which positive emotions or no emotions were induced (Study 1) or in addition negative emotions were induced (Study 2) after which unhealthy food intake was assessed by bogus taste tests. In Study 3, food intake was assessed by registering snack intake in a 7-day diary study together with the emotions accompanying each snacking episode to provide a more ecologically valid test of our hypothesis. Studies 1 and 2 showed that positive emotions, compared to the control conditions, evoked more caloric intake. Dietary restraint did not moderate this effect. Study 2 additionally showed that positive emotions evoked caloric intake to the same extent as negative emotions. Study 3 showed that snack intake in daily life was reported to result from positive emotions more frequently than from negative emotions. *Conclusions:* Positive emotions serve as an important but under-investigated trigger for unhealthy food intake that deserves further scrutiny. Future research should further investigate whether food intake results from emotional arousal in general, or from emotional valence in particular.

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## Introduction

In modern societies excessive food intake has become a more serious threat for human health than hunger and shortage of food (Pinel, Assanand, & Lehman, 2000). Consequently, the factors that make people vulnerable to engage in overeating have been extensively investigated and one important factor that has been identified as contributing to overeating is the experience of emotions. Although the relation between emotions and overeating has been thoroughly investigated during the last few decades, the typical emphasis has been on negative emotions rather than positive emotions as important instigators of overeating (e.g., Greeno & Wing, 1994). The present paper focuses on the role of positive emotions as a trigger for food intake, as positive emotions may be considered as a relatively neglected trigger for indulgence in palatable foods, despite several theoretical indications hinting towards positive emotions as an important trigger for food indulgence.

Several factors may explain why positive affect would precede food intake. First, positive affect and food intake are likely to be related via an associative learning mechanism, where positive feelings have been associated with eating more food (Patel & Schlundt, 2001). That is, across cultures food is irrefutably used to highlight the celebration of special occasions like weddings and birthdays that are generally accompanied by positive emotions (Rozin, 1999). As a result, positive emotions and eating may have become

inherently interrelated. A second explanation can be derived from the observation that socializing and eating are tightly connected. In relation to positive emotions particularly, research has illustrated that increased amounts of food are eaten at meals with familiar and friendly people, not only because it results in an extended time duration of the meal, but also because these people assist in making a meal relaxing and more enjoyable (Chaiken & Pliner, 1990; Wansink, 2004). Third, emotions orient people to goal-related features in the environment. Positive emotions impose a signal that the environment is benign and safe (Andrade, 2005; Schwarz & Clore, 2003). Consequently, attention may be biased toward potential rewards, so that the person can build resources (Fredrickson, 1998; Tamir & Robinson, 2007). In the case of eating, the focus may be directed on the short-term goal of enjoying hedonic foods rather than the long-term goal of watching a diet or keeping a slim figure (Dingemans, Martijn, van Furth, & Jansen, 2009). This assumption is corroborated by findings indicating that when people experience high degrees of positive emotion, they may be more likely to engage in risk behaviors such as alcohol consumption, drug intake, and binge eating (Cyders & Smith, 2008; Martin et al., 2002). A fourth reason is related to research revealing that participants enjoy eating hedonic foods particularly when in a positive mood (Macht, Roth, & Ellgring, 2002). For example, motivation to eat has been found to be higher during joy than during sadness (Macht, 1999) and chocolate was rated as more pleasurable during positive emotions (Macht et al., 2002). Consequently, when in a positive mood exposure to tempting food may increase the pleasure of eating and result in more intake. Finally, research on justifications and self-licensing

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has illustrated that people are motivated to find reasons that justify food indulgence (Kivetz & Zheng, 2006), and amongst these justifications positive emotions have been identified as well-known justification cues (De Witt Huberts, Evers, & De Ridder, 2012). Thus, there are several theoretical indications pointing towards positive emotions triggering food intake.

There are, however, alternative theoretical views on the role of positive emotions in relation to eating (see also Fedorikhin & Patrick, 2010). For instance, according to the “broaden-and-build” theory (Fredrickson, 2001) positive emotions increase personal resources, making subsequent challenges (such as resisting palatable foods) easier to achieve. Similarly, according to the “mood maintenance theory” (Andrade, 2005) positive emotions are believed to decide people against indulgence, since they would not want to undermine the positive feeling by giving in. Accordingly, such theories would not predict that positive emotions precede food intake.

This lack of theoretical consensus is reflected in the empirical evidence. To illustrate, amongst student samples positive emotions have been found to increase eating behavior (Evers, de Ridder, & Adriaanse, 2009), to decrease eating behavior (Turner, Luszczynska, Warner, & Schwarzer, 2010), or to have no effect on eating behavior (Lowe & Fisher, 1983; Yeomans & Coughlan, 2009) compared to neutral emotional states. Other studies that focused on the extent to which individual differences in eating styles predict positive emotion induced eating resulted in diverse outcomes as well. Cools, Schotte, and McNally (1992) found that positive emotions, just like negative emotions, can act as a disinhibitor of dietary restraint, thus showing that positive emotions caused food intake in restrained eaters only. Yeomans and Coughlan (2009), however, found that positive emotions only triggered food intake in individuals who scored low on restraint in combination with high scores on disinhibition. Again other findings were reported by Turner et al. (2010), who found that positive emotions resulted in *decreased* eating among individuals with a more controlled eating style, which is in line with a naturalistic eating study revealing that restrained eaters ate less in the presence of positive moods (Tomiyama, Mann, & Corner, 2009). Finally, in relation to other characteristics than dietary restraint, some studies showed that positive moods resulted in larger meals compared to neutral moods in obese women (Patel & Schlundt, 2001) or in increased eating in binge eaters with high expectations that food is pleasurable and useful as a reward (Dingemans et al., 2009). To summarize, compared to negative emotions, positive emotions have been relatively under-investigated as a trigger of food indulgence and the empirical evidence on how positive emotions affect eating behavior seems inconsistent. Additional research on how positive emotions relate to indulgence seems therefore warranted.

By investigating food intake in a controlled lab environment as well as in daily life, and by comparing positive emotions to neutral as well as negative emotions we aimed to provide more unambiguous evidence for the role of positive emotions in predicting food intake. More insight into the extent to which positive emotions are a relevant and important trigger for unhealthy food intake is pivotal not only to reconcile previous findings, but also to guide future interventions aiming to decrease overconsumption. That is, if positive emotions do prove to be an important, but frequently overlooked trigger for overconsumption, future interventions should be designed to target these critical triggers for unhealthy eating.

Based on the theoretical underpinnings pointing towards an important role of positive emotions in promoting eating behavior, we hypothesize that positive emotions have the potential to trigger intake of palatable foods in healthy individuals. We did not formulate any specific hypotheses in relation to how dietary restraint would affect eating in response to positive emotions, as prior research yielded mixed results (Cools et al., 1992; Turner et al., 2010; Yeomans & Coughlan, 2009), but for reasons of com-

paring our results with these studies we assessed whether dietary restraint moderated the effect of positive emotion on food intake.

### The present studies

In order to investigate our assumption, in two laboratory studies positive emotions were induced and compared to a neutral control condition (Studies 1 and 2) or to a negative emotion condition (Study 2). The advantage of these laboratory studies is that they allow for assessing a causal association between emotions and eating while standardizing the emotional encounter and the external food environment. Actual food consumption was assessed by bogus taste tests (Evers et al., 2009). As assessing food intake in the laboratory may be ecologically less valid, Study 3 entailed a diary study, with snack intake registered several times a day for 1 week. For each eating episode, participants had to register their emotional state in order to allow for testing to what extent positive (and negative) emotions affect people's unhealthy food intake in real life. Assessing the role of positive emotions in both laboratory and field studies is an important contribution to existing research. Across all three studies, we measured dietary restraint as to explore how restraint may affect the role of positive emotions on eating. Only normal weight or overweight participants were included in the analyses, as being underweight (Body Mass Index: BMI < 18) or obese (BMI > 30) has been associated with pathological responses to food (Stice, Spoor, Ng, & Zald, 2009).

### Study 1

In Study 1, film excerpts were used to induce positive emotions in the positive emotion condition vs. no emotions in the control condition. Exposing people to film excerpts has been found to reliably induce the intended emotions (e.g., Turner et al., 2010). We assumed that participants in the positive emotion condition would show higher food intake compared to participants in the control condition.

### Method

#### Participants

In total, 70 university students completed the study. Data from participants with a BMI < 18 ( $N = 2$ ) were excluded from the analyses. No obese people participated. The final sample consisted of 68 participants (16 men; 52 women) with a mean age of 21.9 years ( $SD = 3.3$ ) and a BMI ranging from 18.04–26.83 ( $M = 21.50$ ;  $SD = 1.95$ ); 97% of the sample had a normal weight and 3% was overweight).

#### Procedure

The study was presented as two unrelated studies, one about the effect of multimedia on emotions and one about the effect of cognitions on taste perception. To create standardized satiety states, participants were informed upon scheduling an appointment that they were not allowed to eat 2 h before the study on taste perception; they were only allowed to drink water. After signing an informed consent form, the experimenter randomly started one of two film excerpts as part of the alleged ‘first’ study. In the positive emotion condition ( $N = 36$ ), the film excerpt consisted of four short fragments (e.g., one about a baby panda sneezing so loud that the mother startles). The excerpt had been successfully pilot tested to induce positive emotions. In the control condition ( $N = 32$ ), the film excerpt consisted of a scene about birds in the desert, and had been pilot tested to induce neither positive nor negative emotions. Film excerpts in both conditions lasted 2.5 min. Before and after the film excerpt participants rated their current emotional experience.

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