

Tempt Me Just a Little Bit More: The Effect of Prior Food Temptation Actionability on Goal Activation and Consumption

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People are often exposed to actionable food temptations (i.e., an immediate opportunity to consume, like when friends offer cookies) and nonactionable food temptations (i.e., no immediate consumption opportunity, like ads for chocolate). The results of three experiments suggest that prior exposure to nonactionable food temptations does not prevent the activation of an eating goal, given a subsequent consumption opportunity, while prior exposure to actionable food temptations prevents such activation. As a consequence, prior exposure to actionable food temptations enhances self-control on a current consumption occasion, while prior exposure to nonactionable food temptations reduces it.

Consumers are often exposed to food temptations—in ads, in stores, in bakeries, on coffee tables during social visits, and even in their own refrigerator. Food temptations involve a self-control conflict. For instance, exposure to a mouth-watering dessert may render the experience of the immediate desire (i.e., to eat the dessert) salient as well as

the interfering competing long-term goal (i.e., to restrict food intake and to be healthy; Carver and Scheier 1998; Miller 1951). The conscious sensation of this conflict is what defines a temptation (Fishbach, Friedman, and Kruglanski 2003; Hoch and Loewenstein 1991). Food temptations activate a desire for the cued food and increase its consumption (Fedoroff, Polivy, and Herman 2003; Lambert and Neal 1992). But food temptations may also remind consumers of their food restriction objectives, which may facilitate self-control (Fishbach et al. 2003). In this article, we focus on the effect of the prior activation of such a goal conflict on the eating behavior of the consumer when a new eating opportunity presents itself.

In the current studies, we explore when prior exposure to food temptations hurts or helps consumers' capability to control their subsequent food intake. We focus on "bad" temptations, such as chocolate, sweets, and other obesogenic (i.e., a recent medical term for factors tending to make individuals fat) food items, which are rewarding in the short term but potentially harming in the long term. We demonstrate that actionability of the prior temptation is the pivotal variable. Although the food restriction goal is invariably activated by exposure to prior temptations, the eating goal is activated only when the prior temptation was not actionable. Activation of the eating goal appears to be reduced when consumers have first been exposed to an actionable temptation. It appears that the self-control strategies that are marshaled to deal with the conflict in a first tempting situation (e.g., to avoid overeating at receptions) linger into

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the subsequent temptation situation and hence help consumers to control their food intake. When the prior temptation is not actionable, however, and hence no behavioral conflict is experienced during preexposure, the subsequent temptation activates the eating goal and increases consumption at that time.

CONCEPTUAL BACKGROUND

Prior Temptations Sometimes Hurt Subsequent Resistance

Prior research and observations from everyday life support the common intuition that food temptations constitute a permanent threat to the accomplishment of consumers' long-term food regulation goals. Indeed, larger package sizes increase consumption (Wansink 1996), and stockpiling accelerates the consumption rate of convenience goods due to a higher salience of the food products (Chandon and Wansink 2002). This corresponds to consumers' belief that the more vice products (i.e., products that satisfy a short-term goal but hurt long-term goals, e.g., chocolate, cake, and candy) they store at home, the more vice products they will consume (Werthenbroch 1998).

External cues like visual or aromatic prominence can make food salient (Painter, Wansink, and Hieggelke 2002; Schachter 1971; Wansink 1994). Appetizing olfactory food cues, which render food more salient, have been shown to activate a craving for food and increase eating behavior (Fedoroff et al. 2003; Lambert and Neal 1992). Salient food options are likely to activate appetitive goals, which will disproportionately affect the consumption of temptations. For instance, Shiv and Fedorikhin (2002) found that increasing the salience of the food options in a choice task, by placing the options in front of choosers, causes a relative vice food option (e.g., pizza) to be preferred over a relative virtue food option (e.g., tomato soup). Over all, these findings suggest that exposure to appetizing external food cues arouses the desire to eat. The increased craving for food would lead to increased consumption on a subsequent consumption occasion.

Together, the findings described above corroborate the common intuition that food temptations may be detrimental to the subsequent control of food intake in many circumstances. However, some recent findings in the literature (Fishbach et al. 2003; Gilbert et al. 2004) suggest that food temptations may actually enhance self-control, possibly resulting in decreased subsequent consumption.

Prior Temptations Sometimes Help Subsequent Resistance

Food temptations have been shown to activate inhibitory goals (Fishbach et al. 2003), which may help control food consumption. The prediction that food temptations might help resistance against subsequent food offers may also be derived from Gilbert and colleagues' (2004) critical level model, which proposes that active attempts to solve a problem arise only when the problem becomes serious enough.

People's problem-solving strategies seem to be triggered only by critical levels of hedonic states because they expect intense states (e.g., pain from a bruised leg) to last longer than mild states (e.g., pain from a sleeping leg). Intense hedonic states are overestimated (Gilbert et al. 1998) and trigger self-control strategies, whereas mild states are underestimated and therefore linger unsolved (Snell, Gibbs, and Varey 1995). In the case of food temptations, a similar nonlinear relationship might apply. A large number of candies may trigger concerns about health and diet, whereas small numbers might not. Gilbert and colleagues' (2004) critical level model implies that consumers might be wrong when they buy smaller amounts of vice foods to control their consumption. According to the critical level perspective, exposure to food temptations that exceed the critical level beyond which self-control strategies are triggered might help to control food intake on a subsequent consumption occasion.

The Pivotal Role of Temptation Actionability

In all, then, food temptations may sometimes increase food intake on a subsequent consumption occasion through the activation of eating goals and sometimes decrease food intake on a subsequent consumption occasion through the activation of inhibition goals. However, little is known about the specific circumstances that determine whether an increase or decrease is obtained. In the current article, we claim that actionability of the temptation plays a pivotal role. We will compare prior food temptations that do not offer the opportunity to consume the food temptation and prior food temptations that do offer the opportunity to consume the tempting food with respect to their effects on current consumption. We compare those effects with a control condition without prior temptation. The food temptation that is not actionable (e.g., pictures of food) does not create a self-control conflict. In other words, we assume that nonactionable food temptations do not exceed the critical level beyond which self-control strategies are triggered because there is no self-control conflict present. In contrast, a food temptation that is actionable (e.g., a basket full of delicious cookies), while consumption is not appropriate, implies the self-control conflict induced by the opportunity of immediate consumption. We assume that actionable food temptations push the consumer beyond the critical level at which self-control strategies are triggered. So our main prediction is that, as compared to exposure to nonactionable temptations, exposure to actionable temptations will reduce subsequent consumption. Before demonstrating this effect, we turn to a question concerning the processes involved in this effect.

Hypotheses

Prior literature does not distinguish between actionable and nonactionable temptations when it comes to food restriction goal activation. Although they did not distinguish their temptation manipulations in terms of actionability,

Fishbach and colleagues (2003) showed that exposure to nonactionable (i.e., subliminal priming with words related to fattening food in their study 4 [303]) as well as actionable food temptations (i.e., exposure to a variety of popular fattening food in their study 5 [304]) activate a food restriction goal. This suggests that the predicted moderating effect of actionability does not proceed through differential food restriction goal activation. Nevertheless, we need to be certain that our actionability manipulation does not differentially affect food restriction goal activation. This is the aim of study 1.

H1: Exposure to nonactionable as well as actionable food temptations will result in the activation of the food restriction goal, as compared to the absence of temptations.

Considering our claim that exposure to nonactionable food temptations does not trigger self-control strategies whereas actionable food temptations do, hypothesis 1 raises the question of by which other process self-control enhancement (i.e., food intake control) is obtained. Activation of a food restriction goal is theoretically only one, albeit the literature's favorite (e.g., Metcalfe and Mischel 1999; Shiv and Fedorikhin 2002), route to successful self-control. Following that account, a temptation, upon activating an eating goal, triggers the activation of the food restriction goal, which is believed to reduce consumption. Assuming, however, that the choice in a self-control conflict follows from the balance between desire and willpower (Hoch and Loewenstein 1991), another route to successful consumption control may be through the down-regulation of the desire for food, as reflected in a decreased activation of the eating goal. Fishbach and Shah (2006) recently found that, in addition to the activation of a food restriction goal, the automatic response to food stimuli is a tendency to approach these stimuli (see also Shiv and Fedorikhin 2002). Only actionable food temptations will exceed a critical level (Gilbert et al. 2004) and trigger self-control strategies that result in down-regulating the desire to eat upon exposure to a subsequent temptation. This leads to the following hypothesis, to be tested in study 2.

H2: In the presence of an eating opportunity, preexposure to an actionable temptation will suppress the activation of the eating goal by the eating opportunity to control levels, in comparison with preexposure to a nonactionable temptation.

The predicted goal activation pattern should be confirmed in behavioral findings. If prior exposure to actionable food temptations leads to self-control enhancement through suppression of the eating goal on subsequent actionable eating opportunities, this should also eliminate the effect of rendering food more salient on subsequent consumption. Indeed, prior literature shows that cues that render food more salient typically increase its consumption (Fedoroff et al. 2003; Lambert and Neal 1992; Painter et al. 2002; Wansink 1994, 2004), probably because they activate an eating goal

(Shiv and Fedorikhin 2002). The typical effect of these food cues should be suppressed after preexposure to actionable food temptations, as it reduces the eating goal activation, but not after preexposure to nonactionable food temptations or no temptations. In other words, prior exposure to actionable food temptations should prevent the consumption increase due to food cues that render food more salient. This is what we examine in study 3.

H3: Exposure to actionable food temptations will suppress the effect of cues that increase consumption in the subsequent consumption situation, compared to exposure to nonactionable food temptations or to no prior exposure to food temptations.

In study 1, we tested whether prior exposure to nonactionable as well as actionable food temptations results in the activation of the food restriction goal, as compared to the absence of prior temptations as found by Fishbach and colleagues (2003). In study 2, we tested the effects of prior exposure to food temptations differing in actionability (control vs. nonactionable food temptation vs. actionable food temptation) on the activation of the eating goal when a subsequent food opportunity either is present or absent (study 2; hypothesis 2). In the third study, we tested the effect of the actionability of the food temptation on subsequent consumption behavior. We manipulate the presence of an olfactory cue in study 3A (i.e., food cue external to the subsequent consumption situation) and the convenience of the food offered in the subsequent consumption situation in study 3B (i.e., food cue internal to the subsequent consumption situation) and evaluate whether prior exposure to actionable food temptations suppresses the consumption facilitating effect of these cues.

STUDY 1

In the first study, we measured the activation of the food restriction goal resulting from food temptations differing in actionability in order to verify whether our manipulations indiscriminately activate the food restriction goal as found by Fishbach et al. (2003). Actionability refers to the extent to which the consumer can physically consume the temptation. We expect that the food restriction goal will be activated in the nonactionable as well as the actionable food temptation condition, as compared to the control condition without food temptation. Goal activation was measured by means of a lexical decision task, with faster recognitions of words signifying activation of associated concepts (Fishbach et al. 2003).

Method

Seventy-four female undergraduate students (ages 18–25) at K. U. Leuven participated in partial fulfillment of a course requirement. The temptation conditions were run in separate sessions for procedural efficiency in all studies. Each session was run in groups of a maximum of eight participants.

Temptation Manipulation. On entering the laboratory, participants were given a “knowledge task.” In the nonactionable food temptation condition (NAFT) condition, participants were told that the manufacturer of the Quality Street® candies, which exist in 12 different flavors, was interested in consumer knowledge of the association between flavors and wrapper colors. Participants were asked to associate 12 pictures of the candies (of different colors and shapes) with the corresponding flavor of each candy (e.g., “chocolate with strawberry cream”). In the actionable food temptation (AFT) condition, participants were given the same task while a bowl filled with lots of these Quality Street candies was present next to them. They were told that the candies were placed there because the pictures were not always very clear. They were not allowed to eat any candy during the knowledge task. Participants in the control condition (i.e., no food temptation [NFT]) were asked to match 10 colors with 10 concepts (e.g., “white” with “snow” and “green” with “grass”).

Lexical Decision Task. Right after the temptation manipulation and before they had the opportunity to consume the candy in the AFT condition, participants completed a lexical decision task. Following a 2-second warning screen that included a fixation cross, a stimulus word appeared on the computer screen. Participants had to respond as quickly and accurately as possible by pressing one of two keys to indicate whether the stimulus was a word or a pseudoword. Response times (in milliseconds) and accuracy were recorded. To familiarize them with the task, participants started with a practice round of 10 trials (five neutral words and five pseudowords). The relevant target word was “diet,” which appeared once among the presentation of irrelevant words (e.g., rock or secret) and an equal number of pseudowords (Fishbach et al. 2003).

Results and Discussion

The screening procedure led us to exclude one woman who did not like the candy. Additionally, three outliers were removed (i.e., 4.1%, defined as deviating at least three standard deviations from the mean in their respective conditions), leaving 70 participants in the analyses.

Response Time. We conducted an ANCOVA with “temptation” as a between-subjects independent variable and response time for the word “diet” as the dependent variable, with the average response time for the neutral words as a covariate. The ANCOVA revealed a significant main effect of temptation ($F(2, 66) = 5.87, p < .01$). In comparison with the control condition ($M = 609.51, SD = 119.48$), “diet” was recognized significantly faster in the NAFT condition ($M = 520.16, SD = 80.21; F(1, 66) = 11.60, p < .01$) and the AFT condition ($M = 551.76, SD = 84.41; F(1, 66) = 4.84, p < .05$). There were no significant differences in activation among the two conditions with a food temptation ($F < 2$). These results show that nonactionable as well as actionable food temptations activate the goal to

restrict food intake. In this way, our findings support the first hypothesis and replicate the findings of Fishbach and colleagues (2003).

STUDY 2

In study 2, we explore the role of actionability in the activation of the eating goal in tempting situations. We claim that, when consumers are exposed to an actionable temptation that cannot be consumed ad libitum, they adapt by down-regulating their desire to eat. We further claim that this self-control strategy lingers into the subsequent tempting situation. To test these ideas, we measured the activation of the eating goal resulting from the exposure to food temptations differing in actionability and the presence (yes or no) of a subsequent temptation. We expect the eating goal to be activated after exposure to temptation in both temptation conditions, as compared to the no temptation condition. However, upon providing a subsequent eating opportunity, we expect that the activation of the eating goal will drop to control levels in the actionable temptation condition but not in the nonactionable temptation condition. That is, the self-control strategy used to deal with the tempting situation during preexposure is easily reactivated in a subsequent tempting situation and is reflected in a reduction of the eating goal, despite the presence of a temptation.

Method

One hundred thirty-four female undergraduate students (ages 18–26) at K. U. Leuven participated in the study in exchange for partial fulfillment of a course requirement. The study consisted of a 3 (temptation) \times 2 (food opportunity) design.

Temptation Manipulation. On entering the laboratory, participants were given a “knowledge task” identical to the one in study 1.

Lexical Decision Task. Right after the temptation manipulation and before they had the opportunity to consume the candy in the AFT condition, participants received a lexical decision task with a procedure similar to the one in the first study. However, the relevant target-word was “eating,” which appeared once among the presentation of other neutral words (e.g., rock or secret) and an equal number of pseudowords (Fishbach et al. 2003).

Subsequent Eating Opportunity Manipulation. In addition, a subsequent consumption opportunity was simulated for half of the participants by placing two bowls of the same volume, one with regular M&Ms® (400 grams) and the other with the “new” crispy M&Ms (300 grams), in front of the participants while they started the lexical decision task. These M&Ms were accompanied by a paper message that stated that they were meant for a subsequent taste test. This manipulation resulted in two conditions: the no subsequent eating opportunity condition (NSEO), without the presence of the M&Ms, and the subsequent eating

opportunity condition, in which the M&Ms were present (SEO).

Results and Discussion

The screening procedure led us to exclude three women who did not like the candy. Additionally, five outliers were removed (i.e., 3.8%, defined as deviating at least three standard deviations from the mean in their respective conditions), leaving 129 participants in the analyses.

Response Time. The ANCOVA testing the effects of temptation (NFT, NAFT, AFT) and subsequent eating opportunity (SEO, NSEO) on the response time for the word “eating” (in milliseconds), with the average response time on the neutral words as a covariate, revealed a marginally significant main effect of temptation ($F(2, 122) = 2.80, p < .07$), showing that, overall, the eating goal is activated to a larger extent in the NAFT condition ($M = 448.56, SD = 60.00$), in comparison with the NFT condition ($M = 476.50, SD = 99.75; F(1, 122) = 3.46, p < .07$) and the AFT condition ($M = 481.30, SD = 67.43; F(1, 122) = 4.66, p < .05$). The main effect of SEO was not significant ($F(1, 122) < 1$). However, there was a significant two-way interaction effect (see fig. 1) of temptation and SEO ($F(2, 122) = 6.50, p < .01, \eta^2 = 0.10$), which we describe in detail next.

In the no food temptation (NFT) condition, the presence of the M&Ms in the no subsequent eating opportunity (SEO) condition ($M = 445.84, SD = 46.72$) activated the eating goal in comparison to the no subsequent eating opportunity (NSEO) condition ($M = 507.15, SD = 123.11; F(1, 122) = 8.06, p < .01$), which validates the effect of the presence of the food cue. In the NSEO condition, the eating goal was activated in the NAFT condition ($M = 451.73, SD = 64.98$), as well as in the AFT

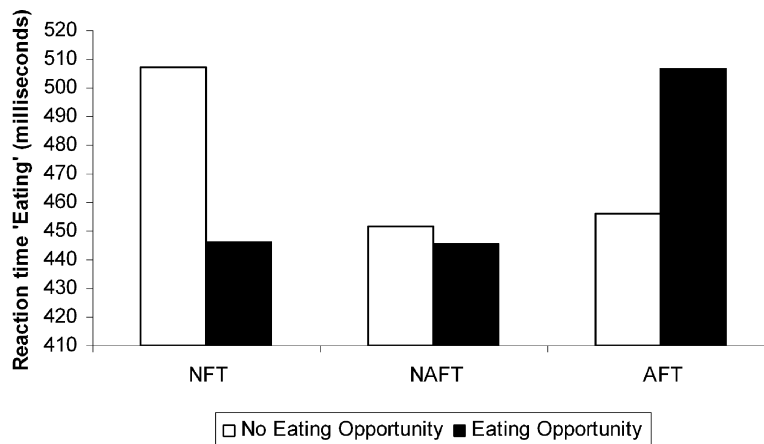
condition ($M = 456.12, SD = 59.43$), as compared to the NFT condition ($M = 507.15, SD = 123.11; NFT vs. NAFT: F(1, 122) = 7.82, p < .01; NFT vs. AFT: F(1, 122) = 6.61, p < .05$), validating the effect of the prior presence of food cues on the eating goal. This implies that nonactionable as well as actionable food temptations activate the desire to eat the cued food.

In the SEO group, the eating goal was activated in the control condition ($M = 445.84, SD = 46.72$) and the NAFT condition ($M = 445.40, SD = 52.40$), as compared to the AFT condition ($M = 506.47, SD = 72.34; control vs. AFT: F(1, 122) = 6.45, p < .05; NAFT vs. AFT: F(1, 122) = 6.57, p < .05$). In other words, the presence of the M&Ms induces a desire to eat in the control and NAFT condition but not after exposure to the AFT, which supports hypothesis 2. Consistently, within the AFT condition, the SEO condition ($M = 506.47, SD = 72.34$) showed a suppressed eating goal activation in comparison with the NSEO condition ($M = 456.12, SD = 59.43; F(1, 122) = 7.82, p < .01$).

One might argue that the instruction in the AFT not to eat any candy before finishing the knowledge task could affect the activation of the eating goal. To rule out this concern, an Immediate Actionable Food Temptation (IAFT) condition was added, which was identical to the AFT condition except for the fact that nothing was mentioned about the candies. We assumed that the experimental setting would provide an implicit social norm that it was not appropriate to consume the candy for the next study. If actionable food temptations trigger self-control processes, the findings should be comparable in both actionable conditions. The results for the IAFT condition (NSEO: $M = 456.72, SD = 81.46$; SEO: $M = 523.26, SD = 144.80$) were similar to those of the AFT condition, indicating that the instruction that participants were not allowed to eat the candies during the task did not affect the activation of the eating goal.

FIGURE 1

REACTION TIME OF THE WORD “EATING” (IN MILLISECONDS) AS A FUNCTION OF TEMPTATION AND FOOD OPPORTUNITY: STUDY 2, WITH NO FOOD TEMPTATION (NFT), NONACTIONABLE FOOD TEMPTATION (NAFT), AND ACTIONABLE FOOD TEMPTATION (AFT)



These findings suggest that exposure to actionable food temptations reduces the activation of the eating goal when a subsequent eating opportunity is offered, whereas exposure to nonactionable food temptations leads to the activation of the desire to eat. The next study addresses the question of whether these goal activation findings transfer to real consumption behavior.

STUDY 3

In the third study, we tested the effects of food temptations, differing in actionability, on consumers' subsequent food intake control. As we stated in the third hypothesis, prior exposure to actionable food temptations should suppress the effect of cues that have been shown to increase consumption to a larger extent than prior exposure to nonactionable food temptations or no prior exposure to food temptations. We rely on the well-documented effects that appetizing food cues, such as scent (Fedoroff et al. 2003; Lambert and Neal 1992) and the convenience of the food offered (Wansink 2004), increase consumption. We use a food cue external to the subsequent consumption situation (study 3A) and one internal to the subsequent consumption situation (study 3B) to generalize the scope of the effect.

Based on prior literature (Fedoroff et al. 2003; Wansink 2004), we expected these cues (scent and convenience) to increase consumption in the control condition because they increase the salience of the cued food. We expected this activation effect to be suppressed after exposure to an actionable temptation but not after exposure to a nonactionable temptation or in the absence of any prior temptation. We do not make predictions for the combination of the two instigating cues because it is not clear how close both factors (food cue and nonactionable temptation) push goal activation and consumption to the ceiling in this particular situation.

STUDY 3A

Method

Two hundred and fifty-one female undergraduate students (ages 17–33) at K. U. Leuven participated in this study in partial fulfillment of a course requirement or in exchange for €6. This study consisted of a 3 (temptation: NFT, NAFT, AFT) \times 2 (scent: no scent, scent) design.

Scent Manipulation. To activate the eating goal, we manipulated ambient scent. When participants entered, the lab was filled either with a scent of freshly baked brownies (i.e., the scent group) or with a neutral scent (i.e., the no scent group). Prior research (Fedoroff et al. 2003; Lambert and Neal 1992) has shown that exposure to an olfactory food cue induces craving, liking, and desire to eat the cued food (i.e., cake and chocolate).

Temptation Manipulation. The temptation manipulations were identical to those used in study 1 and study 2.

Consumption Task. After completing the knowledge

task and before they had the opportunity to eat the Quality Street candy, participants received the second task (i.e., a taste test). Participants were given two bowls of the same volume, one with regular M&Ms (400 grams) and the other with the “new” crispy M&Ms (300 grams). They were told that they were participating in a comparative taste test of both types of M&Ms. The participants were allowed to eat as many of the M&Ms as they needed to evaluate the products on several dimensions (e.g., “Are they crunchy?” “Are they hard to resist?” “Do they have an appetizing aftertaste?” and “Do they have an intense flavor?”). This taste test was conducted at the very beginning of the experimental session to prevent participants from adapting to the scent (Morrin and Ratneshwar 2003), which would eliminate its appetizing effect.

Measurements. After the taste test, the bowls were removed, and the experimenter weighed how many grams of M&Ms had been consumed. Finally, participants had to indicate how much they liked M&Ms and Quality Street candy (on a scale ranging from 0 to 100), which allowed us to exclude participants from the analyses who state, by responding “0” that they really do not like one or both. We also asked the participants how much time had elapsed since their last food intake before entering the lab, as a proxy of their hunger level.

Results and Discussion

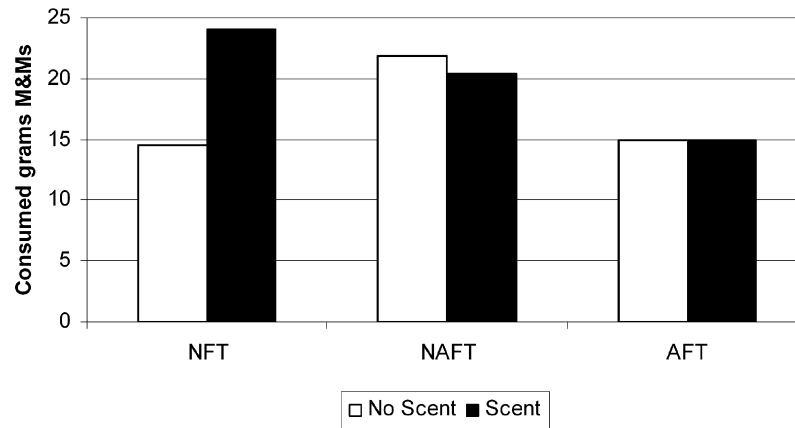
The screening procedure led us to exclude eight women who did not like the Quality Street candy ($n = 6$) or the M&Ms ($n = 2$). Additionally, four outliers were removed (i.e., 1.6%, defined as deviating at least three standard deviations from the mean in their respective conditions), leaving 239 participants in the analyses.

Quantity Consumed. A temptation by scent ANCOVA on the consumed quantity of M&Ms (in grams), with liking for M&Ms (ranging from 1 to 100; $M = 63.22$, $SD = 23.53$) as a covariate, revealed a significant two-way interaction (see fig. 2) between scent and temptation ($F(2, 232) = 3.42$, $p < .05$, $\eta^2 = 0.029$). In the control condition, participants in the scent group ($M = 24.03$, $SD = 18.00$) consumed more than in the no scent group ($M = 14.60$, $SD = 8.78$; $F(1, 232) = 9.03$, $p < .01$), which validates the appetizing effect of the olfactory cue.

In the no scent group, consumption in the control condition ($M = 14.60$, $SD = 8.78$) was comparable to the consumption level in the AFT condition ($M = 14.95$, $SD = 10.67$; $F < 1$). Both were significantly lower than in the NAFT condition ($M = 21.92$, $SD = 20.43$; control vs. NAFT: $F(1, 232) = 4.74$, $p < .05$; AFT vs. NAFT: $F(1, 232) = 4.16$, $p < .05$). In contrast, in the scent group, consumption in the control condition ($M = 24.03$, $SD = 18.00$) was comparable to that in the NAFT condition ($M = 20.38$, $SD = 17.6$; $F < 1$). Consumption in both conditions was higher than the consumption level in the AFT condition ($M = 14.90$, $SD = 10.20$; control vs. AFT:

FIGURE 2

REACTION TIME OF THE WORD "EATING" (IN MILLISECONDS) AS A FUNCTION OF TEMPTATION AND FOOD OPPORTUNITY: STUDY 2, WITH NO FOOD TEMPTATION (NFT), NONACTIONABLE FOOD TEMPTATION (NAFT), AND ACTIONABLE FOOD TEMPTATION (AFT)



$F(1, 232) = 6.95, p < .01$; NAFT vs. AFT: $F(1, 232) = 2.74, p < .10$). The scent does not induce an additional increase in the NAFT condition, as compared to the no scent situation ($F < 1$).

Consistent with hypothesis 3, the consumption in the AFT condition was comparable across both scent levels ($F < 1$). In addition, the consumption level was significantly lower than the consumption level in the scent control group and comparable to the no scent control group. This suggests that preexposure to an AFT suppresses the effect of scent.

STUDY 3B

Method

Two hundred and one female undergraduate students (ages 18–26) at K. U. Leuven participated in partial fulfillment of a course requirement. This study consisted of a 3 (temptation: NFT, NAFT, AFT) \times 2 (convenience: high convenience, low convenience) design.

Temptation Manipulation. The temptation manipulations were identical to those used in study 3A.

Consumption Task. Right after the temptation manipulation and before participants had the opportunity to consume the candy, they completed the consumption task, which was identical to the taste test in study 3A.

Convenience Manipulation. The convenience of the M&Ms was manipulated in the taste test. In the low convenience condition, the two bowls of M&Ms were high and long (i.e., volume: 530 cubic centimeters; surface: 63.6 square centimeters; identical to the bowls used in study 3A). In the high convenience condition, the M&Ms were served in a large dish (i.e., volume: 530 cubic centimeters; surface: 180.0 square centimeters), which made them more convenient to grab. In the control condition, we expected to rep-

licate the typical convenience effect (Painter et al. 2002; Schachter, Friedman, and Handler 1974; Wansink 2004; Wing and Jeffery 2001), namely, that participants would consume more in the high convenience condition than in the low convenience condition.

Measurements. As in study 3A, we measured how many grams of M&Ms had been consumed, how much the participant liked M&Ms and Quality Street candy, and how much time had elapsed since the participant's last food intake before entering the lab.

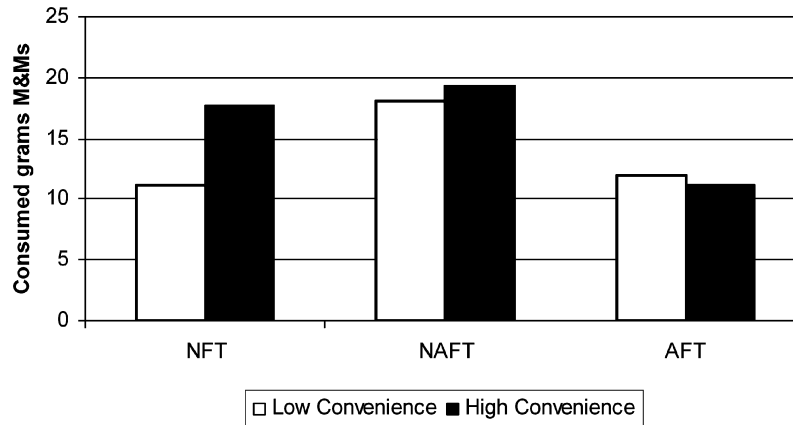
Results and Discussion

The participants were screened by asking whether they liked M&Ms and Quality Street candy. This screening procedure excluded 14 women who did not like the Quality Street candy ($n = 11$) or the M&Ms ($n = 3$). Additionally, three outliers (i.e., 1.6%, defined as deviating at least three standard deviations from the mean in their respective conditions) were removed from the remaining 187 participants, leaving 184 participants in the analyses.

Quantity Consumed. The ANCOVA testing the effects of temptation and convenience on the consumed quantity of M&Ms (in grams), with liking for M&Ms (ranging from 1 to 100, $M = 60.66, SD = 24.49$) as a covariate, revealed a significant main effect of temptation ($F(2, 177) = 6.81, p < .01$). In addition, the two-way interaction (see fig. 3) between convenience and temptation ($F(2, 177) = 2.08, p < .13, \eta^2 = 0.023$) is not significant but hints at the same pattern found in study 3A. Moreover, the effect size is comparable, suggesting that the nonsignificance is probably due to the smaller number of participants. We therefore examined the effect of temptation within levels of convenience. Participants in the control condition consumed more in the high convenience condition ($M = 17.72, SD = 13.65$) than

FIGURE 3

CONSUMPTION AS A FUNCTION OF TEMPTATION AND CONVENIENCE: STUDY 3B, WITH NO FOOD TEMPTATION (NFT), NONACTIONABLE FOOD TEMPTATION (NAFT), AND ACTIONABLE FOOD TEMPTATION (AFT)



in the low convenience condition ($M = 11.19$, $SD = 9.84$; $F(1, 177) = 6.58$, $p < .05$), showing that the convenience manipulation was successful.

In the low convenience condition, consumption in the control condition ($M = 11.19$, $SD = 9.84$) and the AFT condition ($M = 11.92$, $SD = 7.75$) was comparable ($F < 1$). Both were significantly lower than in the NAFT ($M = 18.04$, $SD = 12.51$; control vs. NAFT: $F(1, 177) = 7.10$, $p < .01$; AFT vs. NAFT: $F(1, 177) = 5.17$, $p < .01$). In contrast, in the high convenience condition, consumption in the control condition ($M = 17.72$, $SD = 13.65$) was comparable to that in the NAFT condition ($M = 19.32$, $SD = 13.01$; $F < 1$). Consumption in both conditions was significantly higher than the consumption level in the AFT condition ($M = 11.10$, $SD = 7.07$; control vs. AFT: $F(1, 177) = 5.90$, $p < .05$; NAFT vs. AFT: $F(1, 177) = 8.49$, $p < .01$). Consistent with study 3A, high convenience did not induce an additional increase in the NAFT condition, as compared to the low convenience situation ($F < 1$).

Again consistent with hypothesis 3, the consumption in the AFT condition was comparable across both convenience levels ($F < 1$). In addition, that consumption level was significantly lower than the consumption level in the high convenience control condition and comparable to the low convenience control condition. This suggests that a preceding actionable food temptation suppresses the effect of convenience.

The findings of study 3A and study 3B (see figs. 2 and 3) are strikingly similar. The combination of the two stimulating cues (i.e., the nonactionable food temptation and the actionable M&Ms in the taste test) seems to lead to an increase in consumption in comparison to a neutral (no scent in study 3A and low convenience in study 3B) control condition, which is consistent with previous research that food cues (i.e., nonactionable) render food more salient and in this way increase its consumption (Fedoroff et al. 2003;

Lambert and Neal 1992; Painter et al. 2002; Wansink 1994, 2004), probably because an eating goal is activated (Shiv and Fedorikhin 2002). The finding in the food opportunity condition in study 2 that the eating goal is activated to the same extent in the control condition as in the nonactionable food temptation condition leads us to suggest that there might be a ceiling effect, either in the activation of the eating goal or in the quantity consumed, or in both. Taken together, these results suggest that, in support of hypothesis 2, prior actionable food temptation treatments effectively suppress the consumption increase that typically accompanies an olfactory cue or high consumption convenience.

GENERAL DISCUSSION

This article investigated whether prior exposure to food temptations, differing in actionability (i.e., the opportunity to consume the temptation, e.g., pictures of candy vs. a bowl of candy), help or hurt self-control of food intake in a subsequent temptation situation. Based on Gilbert et al. (2004), we claimed that only food temptations that are actionable will trigger self-control strategies. In other words, we suggested that exposure to nonactionable food temptations will not trigger self-control strategies, whereas actionable food temptations will. An important question is through which process self-control will be achieved. In the first study, we found that all the food temptations, independent of their actionability, activated a food restriction goal (Fishbach et al. 2003), suggesting that another process is responsible for self-control enhancement. Based on Fishbach and Shah (2006), we suggested that self-control enhancement could result from the suppression of the eating goal upon being exposed to food cues. In the second study, we indeed show that preexposure to actionable food temptations (i.e., real candy) suppresses the activation of the eating goal when a subsequent eating opportunity is provided but not when such

an opportunity is not provided. In the second study, we tested whether this also results in self-control enhancement in real subsequent consumption situations. The results show that the effect of cues that have been shown to increase consumption (external, i.e., an olfactory cue in study 3A, and internal, i.e., convenience in study 3B) to the subsequent consumption opportunity is suppressed by the previous exposure to an actionable food temptation. Study 3A tested whether an actionable food temptation is able to suppress the activation of a general craving for food, external to the subsequent consumption opportunity. The data showed that an actionable food temptation indeed inhibits the appetizing effect of an attractive food scent. Also, in study 3B, we found that an actionable food temptation suppresses increased consumption that usually accompanies high convenient (vs. low convenient) food cues (Chandon and Wansink 2002; Painter et al. 2002; Wansink 1994, 2004), again indicating that exposure to actionable food temptations seems to prevent self-control failure on a subsequent consumption occasion.

The results of these studies are consistent with the prediction derived from Gilbert et al. (2004) that exposure to food temptations can result in self-control enhancement (i.e., food intake control) when the critical level beyond which self-control strategies are triggered is exceeded. The non-actionable food temptation might not exceed this critical level, whereas the actionable food temptation apparently does. An opportunity to consume tempting food creates a threat to the long-term goal of restricting food intake, and hence the critical level that triggers self-control strategies is exceeded. These strategies inhibit the craving for food, helping consumers to control their food intake. In this way, our findings complement the research by Fishbach and colleagues (2003, 2006) by stating that the tendency to approach food is overridden only when the critical level of threat is exceeded.

It is important to note that we do not claim that food temptations never lead to self-control collapse. As already mentioned, several studies have shown that consumers lose their self-control when food is made more salient (Chandon and Wansink 2002; Fedoroff et al. 2003; Lambert and Neal 1992; Painter et al. 2002; Schachter 1971; Shiv and Fedorikhin 2002; Wansink 1994, 1996). Our contribution consists in providing evidence that preexposure to salient actionable food cues can enhance successful self-control when the self-control conflict that these cues create exceeds some critical level. The activation of these control strategies prepares the consumer to deal with subsequent temptations.

We also note that our findings are inconsistent with an alternative prediction derived from the self-control strength theory (e.g., Baumeister et al. 1998; Vohs and Heatherton 2000), which states that the exertion of self-control during a first task (e.g., resisting food temptations) leads to self-control failure in a subsequent task (e.g., overconsumption in a taste test). This theory implies that participants in the actionable food temptation condition, which is depleting because they need to resist the candy, should eat more M&Ms

in the subsequent taste test. The results of studies 3A and 3B yield the opposite pattern.

IMPLICATIONS AND FUTURE RESEARCH

Our results support the counterintuitive idea that placing food right in front of consumers might enhance control during a subsequent consumption opportunity, in comparison to advertisements featuring food temptations or no exposure to food cues. The essential trigger for this effect seems to be that pictures of food do not provide a self-control conflict. When a prior temptation exceeds some critical level, it suppresses the activation of the eating goal, which helps consumers to maintain control over their food intake when a new temptation presents itself. The exact dynamics of how and when the critical level is reached need to be explored further in subsequent research. However, it is important to take the presence of the self-control conflict into account in order to investigate these dynamics. If one considers, for example, a situation in which a starving person is exposed to an actionable food temptation, there is no self-control conflict present. If one is starving, one has a strong desire to eat any food independent of the long-term consequences of its consumption. Consequently, the thought of resisting the food because of its unhealthiness will not occur. In our studies, we focus on “bad” food temptations, which are assumed to be tempting for the participants due to the experimental setting. In the AFT condition, the participants know that they are not supposed to eat the candies because of the experimental setup. We acknowledge that this is different from a situation in which someone poses the long-term goal of not eating unhealthy snacks because he or she wants to remain healthy or thin. Nevertheless, both situations require self-control, which is crucial for our findings to be generalized to real life situations. This necessity of self-control conflicts for the attainment of the critical level brings us to another interesting avenue for future research, namely, given a self-control conflict, how tempting should the prior temptation be in order to trigger self-control strategies? In this view, it could be interesting to compare the effects of food temptations differing in salience, like a few candies versus a lot of candies. Such a study might reveal the extent of food exposure that is required to exceed the critical level. Moreover, if experienced self-control conflict is essential for the suppression of the eating goal, the presence of the temptation might not be a sufficient condition for self-control enhancement. In fact, self-confidence might ironically increase the likelihood of subsequent self-control breakdown, exactly because it might reduce the experience of a conflict. Furthermore, it might be interesting to explore whether the self-control enhancing effect of preexposure to actionable food cues can attenuate the typical preference for affect-laden food, for example chocolate, over less affect-laden food, for example fruit (Shiv and Fedorikhin 1999, 2002). We predict that preexposure to an actionable food temptation before the choice between both options is given will attenuate the effects found in Shiv and Fedorikhin’s research (1999, 2002), like we found in our studies 3A and 3B.

Strictly, our results are also only generalizable to female students. Generalization to men and to other age groups also remains a matter for further research.

Another interesting avenue for future research is exploring how suppression of the eating goal is achieved. If an activated food restriction goal would be responsible for the suppression of the eating goal, self-control should have been enhanced after the NAFTA, but it was not. There are two possible explanations for these findings. First, another inhibitor might be responsible for the prevention of the activation of the eating goal. Second, the inhibition of the eating goal by the food restriction goal might start only when the critical level of threat is exceeded (i.e., after actionable food temptations). The exact process leading to the prevention of the activation of the eating goal remains a matter for future research.

Future research should also explore the role of the similarity between the foods in the two phases and the effect of the two types of temptations (actionable and nonactionable). In our research, similarity between the food of phase 1 and that of phase 2 was high, but it was not perfect. The slight difference between the temptation and the consumption domain testifies to the relevance and strength of our effects. The fact that the effects were obtained for slightly differing domains implies that our findings would in all probability also be obtained if the domains were identical. In consequence, it could be interesting to explore the effects of more dissimilar food options in the temptation and the consumption situations. We know from previous research (Fedoroff et al. 2003; Lambert and Neal 1992) that exposure to the appetizing scent of food induces craving, liking, and consumption of the cued food. However, if the offered food (i.e., pizza vs. cookies) differed more strongly from the cued food (i.e., cookies vs. pizza), the effects were not found. These findings imply that exposing consumers to a nonactionable pizza temptation would lead them to consume more pizza-related food but not more pizza-unrelated food because the initial nonactionable pizza temptation induces a desire to eat pizza. For nonactionable temptations, then, high similarity seems to be a requirement. However, for actionable temptations, prior literature is less clear about the role of similarity between the foods in the two phases. Exposure to an actionable pizza temptation might help consumers to control the consumption of pizza-related as well as pizza-unrelated food because of the general suppression of the activation of the desire to eat.

Finally, we call for future research that explores to what extent the effect of the actionable temptation depends on the success of the food restriction. Some research suggests that tasting a little bit of a tempting food could be a successful inhibitor of the urge to eat for binge eaters (Jansen 1998). As a result, small transgressions may reinforce the effect of actionable food temptation on the desire to eat that we illustrated. However, the disinhibition effect suggests that small transgressions may also break down inhibition and hence food intake control. When people exceed the caloric limit they set for themselves for any given day, they tend

to stop restraining their food intake for that specific day and overindulge because the day is already lost (Cochran and Tesser 1996; Polivy and Herman 1985). If consumers would succumb to the actionable food temptation, they might overconsume the food offered at a later point in time because they had already lost control by consuming the tempting food. This would imply that not the opportunity to consume tempting food but rather the opportunity to resist tempting food helps consumers in controlling their consumption on subsequent consumption occasions. The extent to which differences in resistance contribute to our findings remains to be seen in future research.

The results of the three studies imply that tempting consumers with real food may help them to restrict their food intake on a subsequent consumption opportunity. This suggests that having candy in large stocks at home thus might help women with their attempts at controlling their food intake, whereas seeing pictures of food in magazines or on television might lead them to eat more when given the occasion.

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