



# If it's good it must be bad: The indirect effect of temptation strength on self-control through perceived unhealthiness



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## ABSTRACT

Previous research has shown that people tend to consume less from foods they consider more tempting. However, the underlying mechanism for these counterintuitive findings is still unknown. The current paper is the first to test the theoretically implied suggestion that the effect of food temptation strength on consumption is indirect and can be explained through temptations' perceived unhealthiness. Two studies were conducted among female students who were concerned about their weight to test the effect of food temptation strength on perceived unhealthiness as well as the amount that was consumed of the products. Results showed that temptation strength was associated with unhealthiness such that weak temptations were – unjustly – perceived to be less unhealthy compared to strong temptations, while perceived unhealthiness was negatively related to indulgence. As a consequence, people may consume more from weak than from strong temptations. It is concluded that weak temptations tend to be underestimated and can be more challenging for successful self-regulation than strong temptations.

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## 1. Introduction

The obesogenic food environment is often blamed for the rising numbers of overweight in Western societies (French, Story, & Jeffery, 2001). The ubiquitous availability of unhealthy food temptations brings along typical self-control dilemmas between immediate hedonic gratification and long-term health considerations. Although we may especially fear the strong temptations that look most delicious, in this paper we demonstrate that – and why – less attractive subtle temptations may in fact be most dangerous.

Temptations, by definition, are in conflict with a (long-term) goal: they are both attractive and forbidden (Kroese, Evers, & De Ridder, 2011). A traditional viewpoint in the literature is that food temptations automatically trigger hedonic impulsive behavior and inhibit the conflicting weight watching goal (Stroebe, Mensink, Aarts, Schut, & Kruglanski, 2008). Counteractive control theory (Trope & Fishbach, 2000), however, proposes that rather than inhibiting goal pursuit, (food) temptations activate the conflicting goal and trigger self-control processes to protect it (Fishbach, Friedman, & Kruglanski, 2003).

In particular, such processes are suggested to display upon confrontation with strong temptations (i.e., those that present a large threat). Indeed, prior studies have confirmed that strongly attractive food temptations engender better self-control and consequently yield lower consumption than weakly attractive food temptations (Kroese et al.,

2011). However, the underlying process for these intriguing findings has not yet been demonstrated.

One suggested explanation is that weak temptations are perceived to be less 'threatening'. That is, weak food temptations would be believed to be less bad in terms of weight watching goals (i.e., less unhealthy) and consequently fail to trigger the alarm bells that signal the need for defensive self-regulatory action. Strong temptations, on the other hand, would indirectly (through higher perceived threat) yield boosted self-control performance.

The current aim is to provide empirical support for the implied indirect effect of temptation strength on self-control through temptations' perceived threat, or unhealthiness. We expect that temptation strength is positively related to perceived unhealthiness such that weak temptations are believed to be less unhealthy than strong temptations – even when this is not objectively true. This is in line with the “unhealthy = tasty intuition”, reported by Raghunathan, Naylor, and Hoyer (2006). Additionally, we expect that perceived unhealthiness is negatively related to consumption such that, indirectly, weak temptations yield higher consumption compared to strong temptations.

In Study 1 we demonstrate that temptation strength is related to perceived healthiness: weak temptations are considered less unhealthy than strong temptations. In Study 2 we test the indirect effect of temptation strength on consumption through perceived unhealthiness.

## 2. Study 1

Study 1 was designed to demonstrate people's general tendency to associate food temptation strength with unhealthiness.

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## 2.1. Materials and method

### 2.1.1. Participants

Fifty-nine female students participated. Data from one obese participant (BMI > 30) were excluded from analyses, as obese people are known to react differently to food stimuli (Stice, Spoor, Ng, & Zald, 2009). Participants in the final sample ( $N = 58$ ) had a mean age of 21.5 years ( $SD = 1.6$ ), a BMI of 21.8 kg/m<sup>2</sup> ( $SD = 2.5$ ), and were moderately concerned about their weight ( $M = 4.18$ ,  $SD = 1.36$ ).

### 2.1.2. Procedure

The participants were presented with a short text describing a new snack. Temptation strength was manipulated between-subjects by providing different taste ratings that were allegedly given by a test panel: the test panel rated the tastiness of the snack at 6.0 (weak temptation) or 8.5 (strong temptation) on a 10-point scale. After reading the text, the participants rated the unhealthiness of the snack.

### 2.1.3. Material

#### 2.1.3.1. Manipulation text.

A new snack is introduced to the market: a granola bar with pieces of chocolate. [...] The snack was recently presented to a test panel. One question the panel was asked was *how tasty* they found the new snack. The test panel rated the new snack on this question on average at [6.0 – weak temptation condition/8.5 – strong temptation condition] on a scale from 1 – not at all to 10 – extremely.

**2.1.3.2. Estimated unhealthiness and attractiveness.** The participants rated “to what extent they thought the new snack would be healthy” [reverse coded] on a scale from 1 (*not at all*) to 9 (*very much*). In addition, ratings of the new snack’s attractiveness served as a manipulation check for temptation strength.

**2.1.3.3. Control variables.** Self-reported height and weight were assessed to calculate BMI. Weight concern was assessed with one item (“To what extent are you concerned about being slim”) on a scale from 1 (*not at all*) to 7 (*very much*).

## 2.2. Results and discussion

### 2.2.1. Randomization and manipulation check

Two ANOVAs revealed no significant condition effect on BMI and weight concern ( $p$ 's > .33), indicating successful randomization.

An ANOVA testing the effect of condition on snack attractiveness revealed a significant effect;  $F(1, 56) = 9.80$ ,  $p = .003$ ,  $\eta_p^2 = .15$ . Participants in the strong temptation condition ( $M = 5.50$ ,  $SD = 1.69$ ) believed the snack was more attractive compared to participants in the weak temptation condition ( $M = 4.03$ ,  $SD = 1.87$ ), indicating that our manipulation was successful.

### 2.2.2. Estimated unhealthiness

An ANCOVA with condition as independent variable, estimated unhealthiness as dependent variable, and weight concern as covariate, revealed a significant condition effect;  $F(1, 55) = 4.71$ ,  $p = .03$ ,  $\eta_p^2 = .08$ . Participants in the weak temptation condition rated the snack as less unhealthy ( $M = 5.10$ ,  $SD = 1.49$ ) compared to participants in the strong temptation condition ( $M = 5.82$ ,  $SD = 1.47$ ). The covariate was significant;  $F(1, 55) = 4.52$ ,  $p = .04$ ,  $\eta_p^2 = .08$ .

Study 1 thus confirmed our hypothesis that temptation strength is associated with perceived unhealthiness: the mere suggestion that a snack tastes good makes people believe it will be unhealthy.

## 3. Study 2

Study 2 aimed to demonstrate the indirect effect of temptation strength on consumption through perceived unhealthiness. Temptation strength was manipulated by exposing participants to either a large bowl (strong temptation) or three small bowls (weak temptation) of crisps (cf. Coelho do Vale, Pieters, & Zeelenberg, 2008). Perceived unhealthiness was operationalized by assessing participants' estimates of the caloric content of a handful of crisps. Furthermore, consumption of the product was assessed. We hypothesized that weak temptations yield lower caloric estimates, which in turn would lead to higher consumption.

### 3.1. Method

#### 3.1.1. Participants

Forty-three female students participated. Data from 1 underweight participant (BMI < 18) and 3 outliers (>3 SD) on either caloric estimates or consumption were excluded from analyses. Participants in the remaining sample ( $N = 39$ ) had a mean age of 22.6 years ( $SD = 4.3$ ), a BMI of 21.9 ( $SD = 2.5$ ), and were moderately concerned about their weight ( $M = 3.9$ ,  $SD = 2.0$ ).

#### 3.1.2. Procedure

The participants were exposed to either three small bowls of crisps (weak temptation) or one large bowl of crisps (strong temptation). The total amount of crisps was equal across conditions (100 g). The study was presented as a marketing test and participants were asked to taste and rate the crisps on several dimensions (appearance, crispiness, etc.). Before consumption, participants were asked to estimate the number of calories in a handful of these crisps. Afterwards, consumption was unobtrusively assessed.

#### 3.1.3. Materials

**3.1.3.1. Temptation strength.** A pilot test ( $N = 29$ ) confirmed that participants found the large bowl of crisps more tempting ( $M = 4.89$ ,  $SD = 1.11$ ) than the three small bowls of crisps ( $M = 3.42$ ,  $SD = 1.36$ );  $t(28) = 2.90$ ,  $p = .007$ .

**3.1.3.2. Bogus marketing test.** The marketing test involved a number of statements regarding the product. Participants were encouraged to eat at least a little bit to be able to rate the taste of the product.

#### 3.1.4. Main outcomes measures

**3.1.4.1. Caloric estimates.** Participants were asked to “estimate the number of calories in a handful of these crisps”. As a reference, the number of calories in a cheese sandwich (150 Kcal) was given.

**3.1.4.2. Consumption.** The bowl(s) of crisps were unobtrusively weighed before the participants entered the lab and after they had left. Postweight was subtracted from preweight to calculate consumption.

**3.1.4.3. Control variables.** Age, height, current and ideal weight were assessed by self-reports. Weight concern was assessed with 1 item: “To what extent are you concerned about your weight”, on a scale from 1 (*not at all*) to 7 (*very much*).

## 3.2. Results and discussion

### 3.2.1. Randomization check

One-way ANOVAs revealed no significant condition effects on age, BMI, weight concern, or the amount of weight they wanted to lose ( $p$ 's > .35), indicating successful randomization.

### 3.2.2. Caloric estimates and consumption

Including weight concern as a covariate in all analyses, first caloric estimates were regressed on temptation strength, showing that strong temptations yielded higher caloric estimates compared to weak temptations ( $\beta = .39, p = .01$ ). Furthermore, a regression of consumption on caloric estimates showed that higher caloric estimates were associated with lower consumption ( $\beta = -.33, p = .05$ ). Bootstrapping analyses confirmed that the indirect effect of temptation strength on consumption through caloric estimates was significant (95% CI:  $-4.44, -.15$ ).

Study 2 thus showed that participants in the weak temptation condition estimated lower numbers of calories in a handful of crisps compared to participants in the strong temptation condition. Furthermore, lower caloric estimates were related to higher consumption. This finding supports our hypothesis that weak temptations are unjustly believed to be less dangerous compared to strong temptations and consequently yield less effective self-control.

## 4. General discussion

The aim of this paper was to elucidate the processes underlying previous findings that strong temptations engender better self-control compared to weak temptations. Study 1 showed that temptation strength is negatively related to perceived healthiness: a simple fact with regard to the tastiness of a (hypothetical) snack affected its inferred healthiness. Study 2 demonstrated that weak temptations, compared to strong temptations, yielded lower caloric estimates, which in turn led to higher consumption.

Our findings provide empirical evidence for the theoretical implications put forward by counteractive control theory: To the extent that temptations are a threat towards the weight watching goal defensive self-control mechanisms will be activated. However, the threat (i.e., unhealthiness) of weak temptations tends to be underestimated and self-control will be triggered to a lesser extent. Paradoxically, then, in some cases weak temptations may have worse outcomes in terms of self-control behavior compared to strong temptations.

The current studies are in line with previous findings suggesting that weak temptations may be more challenging than strong temptations (e.g., Coelho do Vale et al., 2008; Geyskens, Dewitte, Pandelaere, & Warlop, 2008; Kroese et al., 2011). Furthermore, we add to accumulating evidence suggesting that when trying to behave 'good' by taking food that is not their most favorite temptation, such as small portions (Coelho do Vale et al., 2008) or food that seems rather healthy (Chernev, 2011; Finkelstein & Fishbach, 2010), weight conscious people often display ironic behavior (i.e., overconsume), making dietary failure in fact more rather than less likely.

A seeming limitation is the selective population from which our samples were drawn: young, weight conscious, female students. However, our hypotheses only apply to people who are watching their weight and trying to control their food intake. Female students are particularly likely to fulfill these criteria (Wardle, Haase, & Steptoe, 2006). For unhealthy food to be a temptation, it needs to be attractive as well as 'forbidden', or in conflict with a goal. Hence, for those who do not have a weight watching goal, unhealthy food would not be an actual

temptation and we would not expect to find counteractive self-control effects.

One avenue for future research would be to investigate ways to counter the paradoxical effects of temptation strength on consumption. A first plausible direction could be to make people explicitly aware of the actual healthiness or caloric content of foods, such that estimated healthiness can no longer play a role.

To conclude, the current research provides insight into the underlying processes explaining the effects of temptation strength on self-control. It was demonstrated that people assume a positive relationship between temptation strength and unhealthiness, such that weak temptations are – sometimes unjustly – perceived as less unhealthy. Consequently, dieters paradoxically may fail, not because the food 'was just too good' but because it was only 'just good'.

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### Contributors

All three authors were involved in the design of the study. FK conducted the statistical analyses and wrote the first draft of the manuscript. All authors contributed to and approved the final manuscript.

### Conflict of interest

The authors have no conflict of interest to declare.

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