

Advertising Models in the Act of Eating: How the Depiction of Different Eating
Phases Affects Consumption Desire and Behavior

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Abstract

In print advertising, the use of static pictures depicting models eating food is common practice. However, less is known about how the depiction of models in different phases of consumption (holding food, moving food to mouth, taking a bite, chewing on food) affects consumers. Theories have proposed that not only do individuals mimic actions, but they also adopt the goals and the motivational patterns underlying these actions by observing others. Building on this view, we hypothesized that consumers' desire to eat a food product and their actual consumption of a food product would be greater when the model in the picture was close to engaging in consumption and that desire and actual consumption would be reduced when the model was shown in the process of finishing consumption. In two studies, we found that the participants experienced an increased desire to eat the depicted food (Study 1) and ate more of the advertised food (Study 2) when the model was shown to engage in eating food compared with when the model was shown during completion of a consumption episode. In addition, the results of Study 1 suggest that even subtle differences such as holding food compared with putting food into the mouth might affect consumers' desire to eat. Overall, our results suggest that advertisements may affect consumers' motivation to engage in food intake differently depending on which consumption state they show with the depiction of a model close to engagement in food consumption being most likely to trigger a desire for consumption and an actual engagement in food intake.

Keywords: goal contagion, vicarious goal satiation, goal activation, food advertising, mental simulation, eating behavior, desire

Advertising Models in the Act of Eating: How the Depiction of Different Eating Phases Affects Consumption Desire and Behavior

In the early 1940s, the brand Mars introduced its new marketing campaign under the slogan “Mars are marvelous.” The series of print advertisements that carried this slogan displayed men and women close to indulging in the consumption of a tasty-looking Mars chocolate bar. More than 75 years later, the depiction of testimonials presenting the various stages of food consumption is common practice in food advertising with brands such as Lay’s, McDonald’s, or Campbell’s following Mars’ early example of showing models in the process of consuming food. The objective of such attempts is to present the food as palatable and increase the consumers’ desire to engage in its consumption (e.g., to try and taste the food). In fact, recent research has corroborated the notion that consumption-related images of food (i.e., images that depict a certain food being eaten by a person) are better at positively influencing consumers’ food perceptions (e.g., the perception of how it tastes) than images that depict the food alone (Poor, Duhachek, & Krishnan, 2013). One explanation for the positive effect of advertisements of food that involve the act of consumption is that consumers mimic the model who is doing the consuming (Chartrand & van Baaren, 2009; Genschow, Florack, & Wänke, 2013; Tanner, Ferraro, Chartrand, Bettman, & van Baaren, 2007) and can better imagine experiencing the food themselves (Elder & Krishna, 2012; Papies, 2013).

In the present work, we advance this view and argue that the degree to which advertisements that depict an act of eating influence consumers desire to mimic the consumption of the observed model and engage in consumption of the advertised product may largely depend on the specific phase of consumption that is being shown. Food intake can be divided into simple recurring sub-actions or episodes that lead

from engagement in food intake (starting to eat) to completion of an eating goal (eating up a food). Most significant for the present work, each of these single eating episodes is, on its own, determined by small cyclic phases or actions of levels of engagement and completion of food intake that are already characterized by unique motivational patterns and different states of goal-completion. For instance, while the act of moving food to the mouth indicates engagement in consumption, the act of chewing on food is rather suggesting completion of food intake where the motive to consume food is (at least partially) satisfied.

We argue that such small differences in engagement and completion of an eating goal are particularly important for print advertisements, which are usually static excerpts of one specific phase of an eating episode. In the present work, we propose that imitations of observed consumption behavior are not limited to the specific actions that are being displayed in such advertisements but may also refer to the goals and motivations underlying these actions.

More specifically, in line with the grounded cognition theory of desire (Papies & Barsalou, 2015; Papies, Best, Gelibter, & Barsalou, 2017), we suggest that consumers are able to anticipate the underlying strength of motivation to consume an advertised food from consumption-related images (i.e., images that show a model in the process of eating). Moreover, building on literature on goal contagion (Aarts, Gollwitzer, & Hassin, 2004; McCulloch, Fitzsimons, Chua, & Albarracin, 2011; Tu & Fishbach, 2015; Zhou, Shapiro, & Wansink, 2017), we argue that consumers tend to bring their own goal-directed actions into line with the goals and motivations they identify in others. Consequently, we expected that viewing consumption-related images that display different stages of goal fulfillment should lead consumers to reenact the associated motivational patterns and experiences, and would distinctively

influence their desire to engage in consumption of the depicted food, as well as their actual food intake.

Whereas previous studies have provided evidence that the specific depiction or context of food can trigger or strengthen the desire to eat it (e.g., Elder & Krishna, 2012; Fedoroff, Polivy, & Herman, 1997; Harris, Bargh, & Brownell, 2009; Keesman, Aarts, Vermeent, Häfner, & Papies, 2016), or that eating companions or others influence how much food an observer consumes (e.g., Brunner, 2012; Florack, Palcu, & Friese, 2013; Vartanian, Spanos, Herman, & Polivy, 2015), the present studies are the first to address the presence of models in different phases of food intake in the context of print advertisements. Moreover, the current research examines different phases of a single consumption episode rather than just comparing consumption vs. no consumption images (i.e., showing a full vs. an empty plate or eating vs. not eating models). In doing so, we go beyond previous research and explore the effects of the depiction of different phases of eating that involve fine grained-differences in goal activation, such as the actual distance to goal fulfillment of the eating goal and its associated motivational patterns. Thus, we provide important implications for the possible effects of consumption-related images in advertising, which are usually static excerpts of a very specific phase of food consumption.

Goal Contagion

Research has indicated that individuals have an innate desire to coordinate their preferences and actions with those of others in their environment (Fishbach, Steinmetz, & Tu, 2016). Building on this view, recent findings have shown that perceiving an individual pursuing a goal, even if the goal is not explicitly conveyed, can automatically and unconsciously activate the same goal in the observer (Aarts et al., 2004; Aarts, Custers, & Veltkamp, 2008; Ackerman, Goldstein, Shapiro, & Bargh,

2009). This phenomenon was termed goal contagion (Aarts et al., 2004) and describes the fact that mental representations of a goal (e.g., eating a tasty food) become salient when a person watches goal-directed behavior in others, and this in turn increases the likelihood that the person will pursue a corresponding goal (Bargh, Gollwitzer, Lee-Chai, Barndollar, & Trötschel, 2001).

Only recently, researchers have put forward the idea that, similar to how observed goal pursuit can enhance goal pursuit in the perceiver if the goal is still in action, it may disrupt the observers' goal engagement if the goal is already fulfilled (McCulloch et al., 2011; Zhou et al., 2017). Referring to this phenomenon as vicarious goal satiation, Zhou et al. (2017) observed, for instance, that watching parts of a movie with a character who is in the process of eating is more likely to stimulate consumption of the observed kind of food compared with watching a character who completes eating the meal. Similarly, researchers found that observing a model (another participant) who indicated a preference for a specific food option led to more congruent choices in an observer compared with observing a model who was already eating the preferred food and was completing this action (Tu & Fishbach, 2015). Hence, goal contagion includes inhibition effects that are typically experienced after goal completion (Förster, Liberman, & Friedman, 2007; Förster, Liberman, & Higgins, 2005). Zhou and colleagues (2017) described the process of goal contagion and goal satiation as an "on-off switching," which makes the eating goal more accessible when the observed person continues eating and less accessible when the observed person stops eating, thus mitigating the observer's efforts to pursue the observed goal.

In the present paper, we argue that similar but more refined goal contagion effects may occur when consumers view an advertisement of a particular consumption

episode that depicts either various specific stages of goal pursuit (activated eating goal) or actions that indicate goal completion (deactivated or weakened eating goal). We build our assumption on literature suggesting that consumers possess the ability to mentally simulate the contents of static pictures by activating mental conceptualizations of similar situations from past experiences even in the absence of motion or concrete imaginary appeals (Best & Papies, 2017; Cian, Krishna, & Elder, 2014, 2015; Elder & Krishna, 2012; Papies, 2013; Papies et al., 2017; Papies & Barsalou, 2015).

Predicted Effects of Depicted Consumption Phases on Motivational Strength and Imagined Sensory Experiences of the Consumption Experience

Print advertisements are usually static portraits of a model's food consumption, which can vary in the degree of consumption engagement they display. In other words, they may show a model before actual eating, simply holding food or bringing food to her mouth, engaging in eating and taking a bite of the food, or completing the eating and chewing the bite, and again moving the food away from her mouth. Through accumulated experiences, consumers have learned to associate these different phases of a single consumption episode with distinct motivational processes and cognitive, affective and sensory experiences (Barsalou, 2008, 2009; Best & Papies, 2017; Papies & Barsalou, 2015; Papies et al., 2017). They might have experienced, for instance, that the craving for food is highest just before one indulges in its consumption and that the desire to consume is partially satisfied and the food is experienced as less rewarding once a bite has been taken. Such fine-grained differences in the desire for food and the motivation to engage in its consumption are well in line with motivational principles of goal activation. These principles suggest that individuals experience increased motivational strength as their distance from a

goal decreases (Förster et al., 2005; 2007; Marsh, Hicks, & Bink, 1998) and they experience the strongest motivation to engage in goal attainment shortly before they reach a goal (Brown, 1948; Förster, Higgins, & Idson, 1998).

According to the grounded cognition theory of desire, individuals store such experiences made in typical consumption episodes as situated conceptualizations in memory (Best & Papies, 2017; Papies & Barsalou, 2015; Papies et al., 2017) and they retrieve and reenacted these conceptualizations and their associated motivational, cognitive, affective and physiological patterns once they encounter external cues that are indicative of a similar situation. Along these lines, Papies and Barsalou (2015) argue that memories for food are typically embedded in situated conceptualizations consumers establish during eating experiences. In addition, they suppose that these conceptualizations contain information on the foods' reward value, but also on its sensory properties or the context in which it was consumed and that "cuing these situated representations will trigger simulations of rewarding eating experiences in neural and bodily systems (p. 8)". Most importantly, the authors assume that consumers simultaneously carry different representations of the reward value of and physiological responses toward a food item and the motivation to consume that item due to variations in their previously experienced desire for consuming it.

In line with this view, we believe that consumption-related print advertisements serve as external cues that can trigger different conceptualizations of an eating episode depending on the concrete consumption sequence they show. More specifically, in line with the literature on goal activation and goal contagion (Förster et al., 2005; Zhou et al., 2017), we propose that goal contagion represented by changes in the desire to consume, experienced sensory food properties and real consumption will be stronger for pictures that portray a model in the process of

engaging in food consumption in comparison with advertisements that show completion of a single consumption episode, because these pictures respond to different situational conceptualizations of eating. Furthermore, based on the goal activation theories (Förster et al., 2005; 2007), we argue that consumers' intensity of the sensory imagery of the food and their desire to consume an advertised food will increase as the proximity to the consumption goal increases and should be highest when the consumption goal is depicted as close to completion. It is important to note that in the present research, we define one consumption episode as one sequence of recurring steps during food intake, such as taking a bite, rather than absolute consumption of the whole food or piece of food. Consequently, we define goal completion as progression in one single consumption sequence (on a continuum from holding food to chewing on food) rather than by finishing eating all of the given food.

We tested our hypotheses in two studies in which we presented consumers with pictures of models consuming food in different phases of a single consumption episode. In Study 1, we assessed participants' desire to consume the food and the intensity with which participants imagined the taste, smell, and consistency of the food as a consequence of mimicking the depicted consumption phase (imagined sensory experience). In Study 2, we measured how much participants consumed of the depicted food.

Study 1

This study provides an initial test of our hypotheses that visually depicting an act of engagement into eating a food product in an advertisement will gradually increase a viewer's desire to consume the same product as well as the intensity of the imagined sensory properties of the food product. We hypothesized that the desire and intensity of the imagined sensory properties of the food will increase more the closer

the depicted consumption phase is to goal completion, in other words, the closer it is to the actual physical consumption of the given food product. Note that the intensity of consumers' imagined sensory experience does not refer to consumers' ability to picture themselves in the depicted situation but refers to the sensory intensity they experience as a consequence of imagining the specific consumption phase. Moreover, we expected participants' desire to consume the food and the intensity of the food's imagined sensory properties to decrease when the consumption engagement goal was depicted as being completed, meaning that the actual physical consumption was already taking place and the food was already being processed. Thus, we expected the curve of the strength of the desire to consume the food and the imagined sensory experiences associated with the consumption phases to have a nonlinear trend, represented by a gradual increase during the first two goal stages followed by a decrease after the goal fulfillment stage.

Method

Participants and design. Eighty-eight students (64 female) between the ages of 17 and 35 ($M_{age} = 20.83$, $SD_{age} = 2.85$) participated in the study in laboratory settings for course credit. Participants were recruited from the local subject pool of the University. They gave full consent and received course credit for their participation. Participants were assigned to a random order of the presentation of all four within-subject conditions (consumption phase: holding vs. before consumption vs. consumption engagement vs. consumption completion). A priori power analysis, assuming a moderate effect size, indicated that a sample size of 70 would be adequate to detect a significant effect of the experimental conditions on the desire to consume the advertised food and on the imagined intensity of the sensory consumption experience given a power of .80 (Cohen, 1985) and an alpha of .05.

Procedure and measures. Upon arrival, participants were seated in individual cubicles. All instructions were presented on a computer screen. Each experimental session consisted of two blocks. First, participants viewed a series of eight advertisements of two different food products (i.e., a strawberry and yogurt), which were presented in a random order. Each advertisement depicted a model with her gaze turned toward the viewer in one of four different consumption phases (Figure 1). Specifically, in the “holding” phase, the model was holding a strawberry or a spoonful of yogurt in front of her. In the “before consumption” phase, the model was holding the strawberry or the yogurt in front of her mouth. In the “consumption engagement” phase, the model is depicted as either biting into the strawberry or with the spoonful of yogurt in her mouth. In the “consumption completion” phase, the model is holding the food again farther away from her mouth, while her face shows her chewing or swallowing the food, indicating that she is processing the food and thus the single consumption episode is being completed (for all experimental stimuli, see Appendix A1). For each advertisement, we asked participants to indicate their desire to consume the presented food with three items: “When viewing the picture, I experience the desire to eat the [presented food]”; “I would like to eat the [presented food] after the study ends”; “If I had the [presented food] at hand, I would immediately eat it up” on a 10-point rating scale (1 = *not at all*; 10 = *very much*). The three items were subsequently averaged into one “desire index” for each of the four consumption phases (Cronbach’s $\alpha = .75$; averaged across conditions).

Second, we presented participants with the same eight advertisements, again in a random order, and asked them to indicate, just by looking at the advertisements, the intensity of their imagined sensory consumption experience. We asked how strongly they could feel the smell, taste, and consistency of the depicted product

(“When viewing the picture, I can feel the taste/smell/consistency of the [presented food]”) on a 10-point rating scale (1 = *not at all*; 10 = *very much*). The three items were averaged into one “sensory properties index” per consumption phase (Cronbach’s $\alpha = .88$; averaged across conditions).

Finally, we briefly assessed participants’ extent of restrained ($\alpha = .92$) and external eating ($\alpha = .74$) with the respective subscales of The Dutch Eating Behavior Questionnaire (Van Strien, Frijters, Bergers, & Defares, 1986) and their demographic data.

We also measured participants’ level of hunger prior to and after the experiment on a 5-point rating scale (1 = *not at all*; 5 = *very much*). The participants were then debriefed, thanked for their participation, and rewarded with course credit.

Results of Study 1

To best describe the trend with which the curve of the desire to consume (intensity of imagined food sensory properties) developed over the consumption phases, we fit growth models to our data, using the nlme package in R (Pinheiro, Bates, DebRoy, Sarkar, & R Core Team, 2016). Then, we analyzed the effect of different consumption phases depicted in food advertisements on the desire to consume the presented food and on the experienced intensity of the food’s imagined sensory properties with two separate repeated-measures ANOVAs. The “desire index” and “sensory properties index” served as dependent variables, and the consumption phase was the within-subject factor.

Preliminary analyses. Participants’ feelings of hunger were rather low before the experiment ($M_{hunger\ before} = 2.47$, $SD_{hunger\ before} = 1.26$), and although they remained below the midpoint of the scale, they increased slightly during the experiment ($M_{hunger\ after} = 2.83$, $SD_{hunger\ after} = 1.22$, $t(87) = -4.58$, $p < .001$, $d = 0.49$). The sample could be

characterized by rather moderate levels of both restrained ($M = 2.48$, $SD = 0.91$) and external eating ($M = 3.41$, $SD = 0.52$). The correlation between desire to consume the presented food and the imagined intensity of its sensory properties was $r(88) = .41$, $p < .001$.

Trend analysis. To capture the best fitting trend of the effect of the consumption phase on the dependent variables, we compared the two models defining the consumption phase as linear and quadratic terms for the best model fit indices. The results showed that the quadratic trend better described the pattern of the desire to consume over the course of the consumption phases, $B_{quadratic} = -.25$, $t(262) = -5.70$, $p < .001$. Furthermore, the quadratic trend significantly described the effect of the consumption phase on the intensity of the imagined food sensory properties, $B_{quadratic} = -.49$, $t(262) = -8.77$, $p < .001$. As depicted in Figure 2, these significant trends seemed to reflect the initial increase in the desire to consume (intensity of imagined food sensory properties) the presented food over the first three phases of consumption but also the subsequent reduction in the last phase.

Desire to consume (contrasts). Post hoc comparisons of the consumption phases through paired samples t tests (Table 1) indicated that the desire to consume increased consistently from the “holding” phase to the “before consumption” phase, $t(87) = 4.71$, $p < .001$, $d = 0.50$, and even further in the “consumption engagement” phase, $t(87) = 5.26$, $p < .001$, $d = 0.56$. Afterwards, it again decreased in the “consumption completion” phase, $t(87) = 4.24$, $p < .001$, $d = 0.45$, however it did not return to the baseline of the “holding” level, $t(87) = 5.67$, $p < .001$, $d = 0.60$, but remained at the “before consumption” level, $t(87) = 1.21$, $p = .230$.

Intensity of imagined food sensory properties (contrasts). Paired sample t tests (Table 2) showed that the intensity of the food’s sensory properties also

increased with each subsequent consumption phase from “holding” through “before consumption”, $t(87) = 9.75, p < .001, d = 1.04$, and peaked during the “consumption engagement” phase, $t(87) = 6.79, p < .001, d = 0.72$. Similar to the curve found for the desire to consume, the intensity of the food’s sensory properties became weaker in the “consumption completion” phase ($M = 5.84, SD = 1.92$) in comparison with the “consumption engagement” phase ($M = 6.25, SD = 1.92$), $t(87) = 3.49, p < .001, d = 0.37$; however, it remained stronger than in the “before consumption” phase ($M = 5.34, SD = 1.94$), $t(87) = 3.87, p < .001, d = 0.41$.

Discussion of Study 1

The results of Study 1 revealed that after viewing the food advertisements, the participants adapted the extent to which they wanted to engage in food consumption to the levels of goal-approach and goal-fulfillment displayed by the model in the advertisement. More specifically, both the desire to consume the depicted food and the intensity with which participants imagined the sensory properties of the depicted food progressively increased as the model’s distance from goal-fulfillment decreased and were again reduced after participants viewed advertisements showing the goal being completed. It is interesting, however, that neither the desire to consume the food nor consumers’ imagined intensity of the sensory aspects of the food experiences decreased below the starting level (“holding” phase, farthest away from goal fulfillment). One reason for this observation may be that in order to test the effects of separate consumption phases, our advertisements were comprised of static images of subsequent steps in a single consumption episode extracted from an entire eating process. However, consumption in general is of cyclical nature and the entire eating process would involve many repeated consumption episodes in order to be completed. This is also visible in our advertisements - despite the fact that in the “consumption

completion” condition, we displayed the end of the single eating episode (in the form of chewing and swallowing the food), advertisements still presented the remains of the entire food (a bowl of yogurt or a half-eaten strawberry). This might indicate to consumers that more eating is to be done and thus their overall goal of eating might still have been active to some extent, preventing their experienced desire and the intensity of the sensory food properties to drop to their initial levels.

Although the results of this study are in line with our hypotheses, it is important to keep the study’s methodological limitations in mind. In Study 1, we applied a within-subject design to test our hypotheses with a high statistical power and to allow generalization across different products. However, the mentioned advantages are associated with the disadvantage that the participants might have become particularly aware of the pattern of consumption of the models in the advertisements, thus becoming more sensitive to the differences in the eating phases. Hence, even if we attempted to reduce such effects by using a cover story and random mode of stimuli presentation, we cannot completely rule out that the successive presentation of several advertisements with models in different eating phases from one consumption episode lead to different responses than would the presentation of a single advertisement. Therefore, we tested our assumptions in Study 2 applying a between subject design.

Study 2

Study 2 was designed to test whether the depiction of different phases of a single consumption episode in an advertisement would not only manifest in consumers’ self-reported desire to consume an advertised food but could also be seen in consumers’ actual consumption of the food shortly after they were exposed to the advertisement. For this purpose, we presented participants with a snack advertisement

that depicted a model (a) holding a chip in her hand (“holding” phase), (b) biting into the chip (“consumption engagement” phase), or (c) looking like she was chewing the chip while holding a bitten-off chip in her hand (“consumption completion” phase). In line with the results of Study 1, we expected actual consumption to be highest in the “consumption engagement” phase, that is, when the model indicates she is starting to eat by biting into the chip, as compared with the “holding” and “consumption completion” phases.

Moreover, following the notion that consumers ability to take over the perceived consumption phase and its implied state of goal fulfillment may depend on how easily a person can mentally interact with a depicted consumption object (Elder & Krishna, 2012), we control for the gaze direction of the displayed model as one possible facilitation mechanism in Study 2. More specifically, based on previous research, we argue that consumers’ ability to picture themselves in an advertised consumption situation is facilitated when a model’s gaze is turned towards the viewer, because directed (as opposed to averted) gaze is establishing a communication link between the observed model and the observer (Palcu, Sudkamp, & Florack, 2017; Van der Weiden, Veling, & Aarts, 2010). We therefore manipulated the model’s gaze to look either at the participant or away from the participant, expecting that effects of the consumption phases should be pronounced for advertisements that contain a model who is gazing at the viewer (as opposed to away from the viewer).

Method

Participants and design. We excluded four participants because they did not follow the instructions to test the advertised food. The final sample consisted of 273 participants (176 female) with a mean age of 20.77 years ($SD_{age} = 3.57$) who participated in the laboratory experiment under the cover of a taste test. Participants

were recruited from the local subject pool of the University. Their average BMI was 21.68 ($SD_{BMI} = 2.82$). They gave full consent and received course credit for their participation. Participants were randomly assigned to one of six between-subject experimental conditions resulting from the 3 (depicted consumption phase: holding vs. consumption engagement vs. consumption completion) x 2 (model gaze: toward participant vs. away from participant) experimental design. A priori power analysis indicated that a sample size of 252 would be sufficient to detect a significant moderate effect of the experimental conditions on food consumption with a power of .80 (Cohen, 1985) and an alpha of .05. Estimated effect size was derived from previous literature on goal contagion reporting a moderate effect of observed food consumption on eating behavior ($d = 0.44$; Zhou et al., 2017).

Procedure and material. Participants were invited to participate in a product taste test at the laboratory of a major university. All participants were instructed to refrain from eating for at least two hours prior to the experiment. Upon arrival, they were seated in individual cubicles. To avoid any experimenter effects on food consumption, all instructions were given on the screen. The product to be tested was hidden under a box that was positioned on the table next to the computer screen.

We presented participants with a series of six advertisements of different snacks in a random order and asked them to look freely at the advertisements. Participants were told that they should pay attention to the advertisements because they would have to test one of the advertised products at a later stage of the experiment. The presented set of advertisements was comprised of five filler advertisements, featuring different snacks, and one target advertisement that depicted the product that was available for testing. Depending on the experimental condition, the target advertisement showed a model holding a potato chip (as in crisp) in her

hand (holding condition), a model biting into the chip (consumption engagement condition), or a model chewing and holding a bitten-off chip in her hand (consumption completion condition). Moreover, the advertisements differed in whether they featured a model gazing at the participant or gazing away from the participant (e.g., gazing at the product or closing her eyes). Conditions were drawn randomly upon presentation to ensure that the experimenter would be blind to the experimental manipulation. Filler advertisements were chosen from actual advertisements of snacks and resembled the target advertisement in terms of design and complexity (for all experimental stimuli, see Appendix A2).

After the six advertisements had been showed, participants were again presented with the target advertisement of chips and instructed to open the box in front of them and test the respective product. The test product was a single 30-g pack of the advertised chips. As part of the product tasting, participants were requested to answer a series of questions about the product's taste (three items; "How much do you like the product's taste/taste intensity/taste development in your mouth?"), visual characteristics of the product (three items; "How much do you like the product's color/size/form?"), the product's texture (three items; "How much do you like the product's crispiness/greasiness/feeling in your mouth?"), the product's smell (two items; "How much do you like the product's smell/smell intensity?"), and the extent to which the participants liked the product overall ("How much do you like the product overall?") on a 7-point rating scale ranging from 1 = *not at all* to 7 = *very much*. The tasting questionnaire was intended to serve as an initiator for food consumption. It is important to mention that the target advertisement remained visible on the screen during the entire product testing.

After participants decided they were done testing the product, they were

instructed to call the experimenter. The experimenter retrieved the product package and weighed its remaining contents in a subtle manner so that the participant would not notice.

Finally, similarly to Study 1, we assessed participants' extent of restrained eating ($\alpha = .74$) with the respective subscale from The Dutch Eating Behavior Questionnaire (Van Strien et al., 1986) and their demographic data. Participants' level of hunger prior to and after the experiment was again measured on a 5-point rating scale (1 = *not at all*; 5 = *very much*). Participants were then debriefed, thanked for their participation, and rewarded with course credit.

Results of Study 2

We computed the total amount of consumed food by subtracting the weight of the chips package after the taste test from its initial weight. Participants consumed an average of 6.92 g of potato chips ($SD = 5.32$ g), which corresponded to approximately eight to 10 chips. The consumed amount of chips was slightly positively skewed (1.614) and showed significant deviations from normality, $D(273) = 0.143, p < .001$. To account for this phenomenon, we applied a generalized linear model (GLM) for Gamma-distributed data using the stats package from the R Core Team (2016; Version 3.3.1). This model assumes a continuous gamma distribution for the dependent variable (i.e., the amount of chips that were consumed) with lower consumption amounts being more frequent than high consumption amounts. The factors consumption phase (holding vs. consumption engagement vs. consumption completion) and model gaze (toward vs. away from participant) as well as their interaction served as predictors in this model.

Preliminary analyses. First, to determine whether it would be necessary to include covariates in our subsequent analyses, we tested for differences between the

consumption conditions: there was no difference in hunger, $F(2, 270) = 0.742, p = .48$, BMI, $F(2, 270) = 0.441, p = .64$, and restrained eating, $F(2, 270) = 0.266, p = .77$, and there was no differences in the gender distribution between the consumption conditions, $\chi^2(2, N = 273) = 1.825, p = .40$. We then analyzed whether the different advertisements had an effect on participants' overall evaluation of the chips as assessed with the taste questionnaire. Results indicated no effect of the consumption phase (holding vs. consumption engagement vs. consumption completion), the model gaze (toward vs. away from participant), or its interaction on consumers' overall evaluation of the chips, $F_s \leq 1.674, p \geq .189$.

Effect of consumption phase on amount of chips consumed. Results revealed a significant main effect of the consumption phase condition on the amount of chips participants consumed, Wald $\chi^2(2, N = 273) = 3.775, p = .035, d = 0.24$. Because consumption phases were manipulated between participants, differences in trends in consumption were determined with post-hoc group comparisons between the experimental conditions. Post hoc contrasts between the consumption phases (Table 3) revealed a decrease in the amount of chips consumed between the "consumption engagement" phase and the "consumption completion" phase, $\chi^2(1, N = 273) = 7.512, p = .006, d = 0.34$, but there was no increase in consumption between the "holding" phase and the "consumption engagement" phase, $\chi^2(1, N = 273) = 1.164, p = .28$. However, we did find a marginally significant decrease in consumption between the "holding" phase and the "consumption completion" phase, $\chi^2(1, N = 273) = 3.389, p = .066, d = 0.22$. Our findings indicated no effect of the interaction between the consumption phase condition and the model gaze condition on the amount of chips consumed, Wald $\chi^2(2, N = 273) = 1.368, p = .18$. The main effect of gaze was nonsignificant, Wald $\chi^2(1, N = 273) = 1.013, p = .18$.

Discussion of Study 2

In line with our assumptions, the results of Study 2 revealed goal contagion effects on actual food consumption such that consumption was higher when consumers were exposed to an advertisement showing a model close to actually engaging in the consumption of an advertised food in comparison with an advertisement showing a model in the act of completing the single episode of food consumption. However, in contrast to Study 1, actual food consumption seemed to be less sensitive to fine-grained effects of goal-pursuit demonstrations as indicated by the lack of difference in the amount of food that participants actually consumed after being exposed to the “holding” and “consumption engagement” advertisements.

General Discussion

According to Poor and colleagues (2013), nearly 25% of food advertisements that were published in the top 20 consumer magazines in 2011 can be classified as images that show a model in the process of consuming food. However, less is known about how the depiction of models in different phases of consumption (holding a product, just before consumption, engaging in consumption, completing consumption) affects consumers. On the basis of theories proposing that not only do individuals mimic behavior, but they also adopt goals and motivational strength associated with the pursuit of these goals through the observation of others (Aarts et al., 2004), we hypothesized that the extent to which consumers are prone to desire and to consume a food product will be stronger the closer the depicted distance from actual consumption is and that it will be reduced upon completion of the single consumption episode. In two studies, we found that consumers experienced an increased desire to consume the depicted food (Study 1) and also actually consumed more of the depicted food (Study 2) when the model was portrayed as not having completed her food

consumption compared with when the model was portrayed as completing her consumption of the piece of food.

Whereas previous research has compared advertising images of models who are consuming food with images that show a model that is not interacting with the food and images that present the food more prominently (Poor et al., 2013), the present paper is the first to demonstrate that the specific stage of consumption that is displayed significantly affects consumers' desire to engage in the consumption of the advertised food and the amount of food consumed. It is important to mention that in our studies, we varied the phase of consumption that was depicted, but we held constant other relevant aspects (e.g., the size of the presented food and the models). Hence, the reported findings do not depend on the presented food having a different degree of saliency due to physical features such as its size or positioning in the advertisement.

Our basic finding was that depicting a model before and during consumption engagement in contrast to completing consumption has an effect on viewers' desire to consume as well as their actual consumption. This provides further evidence that there are social influences on eating behavior as has been documented in numerous studies (Cruwys, Bevelander, & Hermans, 2015; Florack et al., 2013; Higgs & Thomas, 2016; Salvy, Romero, Paluch, & Epstein, 2007). Moreover, our finding contributes to research on goal contagion (Aarts et al., 2004) and vicarious goal satiation (McCulloch et al., 2011; Zhou et al., 2017). Our research extends these streams of research and is original in its testing of the notion of a goal-stage contagion; that is, the viewer projects others' stages of goal pursuit on the self after being exposed to static images of consumption. Indeed, goal contagion and vicarious goal satiation effects have mainly been assessed through methods that allow participants to observe

others who actually engage in goal pursuit or goal fulfillment over a certain period of time (Aarts et al., 2004; Ackerman et al., 2009; Dik & Aarts, 2007; McCulloch et al., 2011; Zhou et al., 2017). Such situations usually provide a series of behavioral cues for an observer to facilitate the perception of these actions in terms of the goals they imply (Aarts et al., 2004; Aarts & Hassin, 2005). Static images, on the other hand, constitute single representations of a specific state of goal pursuit and convey information about the fine-grained aspects of the goal process such as the actual distance to goal fulfillment or goal satiation.

The results of Study 1 support the idea of such fine-grained effects related to the depiction of different consumption phases that take place before actual engagement in consumption of a piece of food. They provide a first hint that consumers' self-reported desire to engage in food consumption after being exposed to a consumption-related image follows the typically observed gradient of goal activation: The desire to consume increases the closer the depicted model is to engaging in food consumption and decreases again if the displayed model indicates the completion of a consumption episode (Förster et al., 2007). For instance, in Study 1, we observed that even an image of a model holding food at a greater distance compared with an image in which the food was close to the mouth affected participants' desire to consume the food in distinctly different ways. However, it is important to note that in Study 2, we observed differences between pre- and postconsumption-engagement images as predicted by the goal-contagion and goal-satiation assumptions but not the more fine-grained differences due to varying the depicted distance from the eating goal. An explanation for the different results in Study 1 and Study 2 regarding the pre-consumption engagement phase could be that participants' actual consumption of the advertised food in Study 2 evoked a variety of

actual sensory experiences which might have overwritten the initial fine-grained desires to consume food that were elicited by the presented images before the actual eating took place. Even if the degree to which consumers expect a certain food to satisfy their hunger is correlated with actual food intake, this is not a one to one relation (Guillocheau et al., 2018). Rather the actual food intake is influenced by many different variables and the desire for food eaten can decrease faster than the desire for food not eaten (Rolls, Rolls, Rowe, & Sweeny, 1981).

Besides affecting the desire to consume, Study 1 also showed that the depiction of the model in the different consumption engagement phases also had an influence on the intensity with which consumers experienced the sensory properties of the depicted products. Participants indicated that they were able to better imagine the taste, smell, and consistency of the depicted product when viewing the phases that were closer to the actual engagement in consumption compared with the phase in which the model only held the product and the after consumption engagement phase. Hence, consumption-related images showing a model with food just before consumption represent yet another form that fosters mental images of sensory experiences. This once again underscores the notions that static images represent a sensory analog to actual objects or situations and trigger mental simulation of experiences and actions associated with the depicted content (Cian et al., 2014, 2015; Elder, Schlosser, Poor, & Xu, 2017; Elder & Krishna, 2012). Our observation that the intensity of the imagined sensory properties of the presented food such as taste, smell, and feel develops along a similar pattern as the strength of the desire to consume further corroborates research findings demonstrating that vivid sensory images accompany perceptions of desirable foods (Kavanagh, Andrade, & May, 2005; Papies, 2013).

A further important finding of Study 2 is that the evaluation of the food did not vary between the phases. This indicates that advertisements activating the goal of eating an advertised food in an observer do not necessarily have to influence its evaluation. Such an observation is in line with recent research that suggests that, even though the desire for a specific food (or wanting) and its evaluation (or liking) are related constructs, they might still be dissociated in the sense that liking is an affective judgment that does not necessarily include the motivation to consume food in a given moment (e.g., Finlayson, King, & Blundell, 2007; Garbinsky, Morewedge, & Shiv, 2014).

Besides inducing a specific stage of a consumption goal, images of a model that is consuming food can also constitute a social norm for intake, which may become particularly relevant if consumers are insecure about the appropriateness of their food intake (e.g., Florack et al., 2013). Building on this view, previous research (Poor et al., 2013) has shown that images, which show a model in the process of consuming food help to reduce the conflict consumers experience when faced with pleasurable but unhealthy food by shifting consumers' focus away from the cognitive evaluation of the food ("This food is not good for me") to the more affective dimension of consumption ("I enjoy eating this food"). Even though this research provides another interesting approach to how consumption-related images can influence consumers' affective response to tasty (but unhealthy food) it focused on taste evaluations and not consumers' desire to eat an advertised food or their actual consumption of a depicted food. Moreover, the authors did not discriminate between different stages of a consumption episode, but only between those images that show a model in the act of consuming and those images, which depict a model that is not directly interacting with the advertised food. It is important to note that a normative

account such as the one proposed by Poor and colleagues (2013) does not explain our findings. In other words, assuming that all images that show an act of consumption should, in principle, constitute the same consumption norm (namely the norm that consumption is appropriate) regardless of the actual consumption phase they show, effects on food intake should not depend on the actual consumption stage that is being shown if consumption-related images work on a normative basis. The differences between the unique consumption stages that we observe in our research are instead well in line with theories of goal activation (Förster et al., 2007) and goal contagion (Aarts et al., 2004). We believe that both accounts exist in parallel and focus on different aspects of consumption and do not offer different explanations for the same effect. Separating the different aspects of consumption that are influenced through images that show a person in the act of consuming is a promising ground for future research given that, to our knowledge, our study and the study of Poor and colleagues (2013) are the first to address this issue.

The results of the present studies are very important for practice for two main reasons: First, several persuasion strategies build on consumers' capacity to envision themselves in a consumption situation that includes the product that is advertised (Philips, 2017). Our results suggest that merely presenting consumers with a still image of a model who is consuming food can trigger a mental simulation of the consumption experience in the consumer. Second, images depicting a model who is about to consume food might be used to overcome the challenge that consumers generally spend only a limited time looking at an advertisement (Pieters, Wedel, & Batra, 2010; Elsen, Pieters, & Wedel, 2016). It does not take more than a few fixations to identify the meaning of the picture (Pieters & Wedel, 2012). Finally, the fact that depicting goal stages in advertisements is most likely to impact consumer

behavior on a motivational level suggests that other outcome variables (e.g., the intent to purchase a food product) may be similarly influenced by such images, and our results may be transferred to other domains where food image exposure is designed to lead to immediate action. For instance, in light of the increasing global obesity problem, researchers are constantly exploring ways to promote healthy food choices in consumers (e.g., Cioffi, Levitsky, Pacanowski, & Bertz, 2015; Thorndike, Riis, Sonnenberg, & Levy, 2014). We suggest that one way to nudge consumers to implement healthier food choices could be to present them with advertisements of models who are close to engaging into eating a healthy food (e.g., an apple) placed in an adjacent location to where the food is being sold.

Overall, the present research provides first indications that static excerpts of specific eating phases can distinctively influence consumers' desire for eating and their actual food intake. In doing so, they provide valuable insights for how consumption-related images have to be designed to shape consumer behavior.

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Table 1

Scores for the Desire to Consume in the Four Consumption Phase Conditions (Study

1)

	<i>M</i>	<i>SD</i>
Holding	3.52 _a	1.48
Before consumption	4.06 _b	1.56
Consumption engagement	4.64 _c	1.84
Consumption completion	4.20 _b	1.70

Note. Means with different subscripts between rows are significantly different at $p < .001$ in paired sample t tests.

Table 2

Scores for Intensity of Imagined Food Sensory Properties in the Four Consumption Phase Conditions (Study 1)

	<i>M</i>	<i>SD</i>
Holding	3.78 _a	1.96
Before consumption	5.34 _b	1.94
Consumption engagement	6.25 _c	2.04
Consumption completion	5.84 _d	1.92

Note. Means with different subscripts between rows are significantly different at $p < .001$ in paired sample t tests.

Table 3

The Amount of Food Consumed in the Three Consumption Phase Conditions (Study 2)

	<i>M</i>	<i>SD</i>
Holding	6.81 _a	4.88
Consumption engagement	7.98 _a	6.07
Consumption completion	5.84 _b	1.92

Note. Means with different subscripts between rows were significantly different at $p < .07$ and $.05$, respectively, based on the Kruskal-Wallis rank sum test.



Figure 1. Example pictures of the different consumption phases used in one of the consumption episodes presented in Study 1.

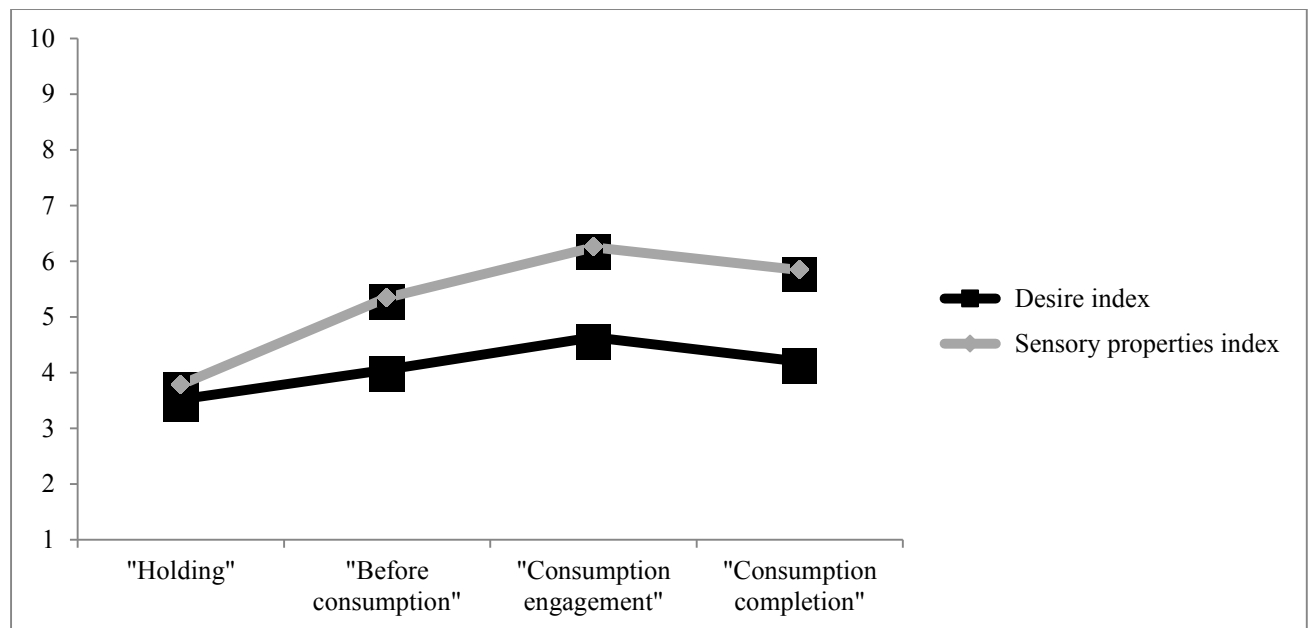


Figure 2. Curve of desire to consume and mental simulation of the food experience across the four consumption phases depicted in the advertisements presented to participants in Study 1.