



# Cereal Deal: How the Physical Appearance of Others Affects Attention to Healthy Foods

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## Abstract

This eye-tracking study investigated whether the physical appearance of another consumer can influence people's visual attention and choice behavior in a grocery shopping context. Participants ( $N = 96$ ) took part in a lab-based experiment and watched a brief video recording featuring a female consumer standing in front of a supermarket shelf. The appearance and body type of the consumer was manipulated between conditions, such that she was perceived as 1) healthy and of normal weight, 2) unhealthy by means of overweight, or 3) unhealthy through visual signs associated with a potentially unhealthy lifestyle, but not by means of overweight. Next, participants were exposed to a supermarket shelf with cereals and were asked to choose one alternative they could consider buying. Prior exposure to a seemingly unhealthy (vs. healthy) consumer resulted in a relative increase in participants' visual attention towards products perceived to be healthy (vs. unhealthy), which prompted cereal choices deemed to be healthier. This effect was stronger for products that holistically, through their design features, managed to convey the impression that they are healthy rather than products with explicit cues linked to healthiness (i.e., the keyhole label). These results offer important implications regarding packaging design for marketers, brand owners, and policy makers. Moreover, the findings highlight the value of technological tools, such as eye-tracking methodology, for capturing consumers' entire decision-making processes instead of focusing solely on outcome-based metrics, such as choice data or purchase behavior.

**Keywords** Visual attention · Eye tracking · Food choice · Health · Packaging design · Nonverbal cues

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## Introduction

A wide array of nonverbal social cues, ranging from physical attractiveness (Argo, Dahl, & Morales, 2008; Otterbring, 2020; Reingen & Kernan, 1993), body type (Campbell & Mohr, 2011; McFerran, Dahl, Fitzsimons, & Morales, 2010a; Otterbring, Ringler, Sirianni, & Gustafsson, 2018), and facial expressions (Fagerström, Pawar, Sigurdsson, Foxall, & Yani-de-Soriano, 2017; Otterbring, 2017; Small & Verrochi, 2009), to physical proximity (Argo, Dahl, & Manchanda, 2005; Luck & Benkenstein, 2015; Xu, Shen, & Wyer, 2012), interpersonal touch (Crusco & Wetzel, 1984; Gallace & Spence, 2010), and the real or imagined presence of others (Griskevicius, Tybur, & Van den Bergh, 2010; Otterbring & Lu, 2018; Söderlund, 2016), have been shown to influence consumers' responses in various sales and service settings. Such cues have also been examined in connection to consumers' food-related decisions. For example, Otterbring and Shams (2019) found participants to decrease their choices of unhealthy meal alternatives on a food menu when the menu depicted a female with an unhealthy (vs. healthy) appearance, which in that particular study was conceptualized as the female being overweight (vs. normal weight). Using eye-tracking methodology, they further revealed that this effect was mediated by visual attention, with a larger number of participants' visual attention falling on the healthier meal options after exposure to the overweight (vs. normal weight) female.

However, although an unhealthy appearance has been almost synonymous with being overweight in the literature (Campbell & Mohr, 2011; Manippa, van der Laan, Brancucci, & Smeets, 2019; McFerran et al. 2010a, 2010b; Rodriguez, Finch, Buss, Guardino, & Tomiyama, 2015) other indicators have also been utilized, such as visual cues linked to clothing style, pale skin, heavy makeup, tattoos, or indicators of excessive smoking or alcohol intake (Cruwys, Bevelander, & Hermans, 2015; Gao & Mattila, 2017; Huneke, Benoit, Shams, & Gustafsson, 2015; Johnston, 2002). Given that unhealthy aspects can be communicated beyond weight-salience manipulations, the present study employs both an overweight individual and an individual whose appearance may signal an unhealthy lifestyle, which is in line with previous related research. Indeed, an eye-tracking experiment by Huneke et al. (2015) showed that even the portrayal of a waitress of normal weight whose appearance was associated with an unhealthy lifestyle was sufficient to influence participants' visual attention towards the available food alternatives on a restaurant menu, indicating that these effects are not only related to the weight status of the stimulus person.

The eye-tracking studies above (Huneke et al., 2015; Otterbring & Shams, 2019) were conducted in a consumer context wherein participants selected a food item that was expected to be eaten immediately after the choice had been made. In addition, the healthiness of the options was clearly stated by means of their calorie content, and the stimulus person was depicted either as an employee or as a spokesperson associated with the restaurant offering the different meal options stated on the menu. An interesting question that arises is whether these results may generalize to other consumer contexts and person characteristics. For example, could the same effects emerge as a function of the physical appearance of other *consumers* rather than employees and will such nonverbal cues influence consumers' decision-making processes and choice behavior even in situations where the food items are not necessarily consumed immediately, such as when a consumer is shopping for groceries?

The aim of the present study is twofold. First, we investigate whether the physical appearance of another consumer influences individuals' visual attention and choice behavior in a grocery shopping context. In particular, we examine whether prior exposure to a consumer whose appearance signals an unhealthy (vs. healthy) lifestyle may affect other consumers' attention and choices towards seemingly healthy (vs. unhealthy) food products. Second, we examine whether this potential impact is particularly powerful for products that holistically, through their packaging design, manage to signal healthiness rather than products with explicit health cues. We use the keyhole label as an explicit health cue, given that it identifies healthier food products within any given food category. This label is an initiative from the Swedish National Food Agency but also exists in Denmark, Norway, and Iceland. Its presence (vs. absence) on a food product signals that the food item in question typically contains less sugar, fat, and salt, and more fiber and whole grains.

Our findings not only contribute to the growing body of literature on attention and consumer choice (e.g., Larsen, Sigurdsson, & Breivik, 2017; Menon, Sigurdsson, Larsen, Fagerström, & Foxall, 2016), but add to research on how the physical appearance of others influences visual attention towards food options with explicit versus holistic cues linked to healthiness. Although prior research has shown how health cues on product packaging can affect visual attention and the subsequent choices of healthy or unhealthy food options (e.g., Fenko, Nicolaas, & Galetzka, 2018; Kim, Tang, Meusel, & Gupta, 2018), the literature lacks a comparison between food options with a design that holistically signals healthiness (which may or may not correspond to the actual content) and food options designed with explicit cues associated with healthiness. Moreover, our work highlights the importance of technological tools, such as eye-tracking methodology, for capturing consumers' decision-making processes rather than only studying the final outcome in terms of product choices or purchase patterns (Dallery Kurti, & Erb, 2015; Sigurdsson, Menon, & Fagerström, 2017). As such, our research contributes with a process tracing perspective pinpointing the relevance of new technology for understanding consumers' health-related behaviors (Rafacz, 2019; Sigurdsson, Larsen, & Gunnarsson, 2014).

## Theory and Hypotheses

### Others' Appearances and Consumers' Food-Related Decisions

Implicit biases are attitudes that affect individuals' actions, judgments, and decisions without their conscious awareness (Greenwald & Krieger, 2006). These biases have been shown to explain many stereotypes (Jolls & Sunstein, 2006), including, for instance, why prior exposure to overweight people may motivate women to shift their attention towards food options related to a healthy lifestyle, especially those options that holistically signal healthiness (e.g., Otterbring & Shams, 2019). Research on biases against overweight people is extensive and the literature shows how such individuals are stigmatized as, for example, unintelligent, unattractive, and unlikeable (Cramer & Steinwert, 1998; Crandall et al., 2001; Wang, Brownell, & Wadden, 2004). Central for the current investigation, exposure to a person with an unhealthy appearance has been shown to activate certain cognitions and behaviors that are either consistent with or in

contrast to the appearance-related stereotype (e.g., Duguid & Thomas-Hunt, 2015). However, whether individuals' actions after the exposure will be consistent with or contrasting to the stereotypic bias seem to depend on the study-specific instructions and the strength of association between the stimulus person and the subsequent experimental task. Campbell and Mohr (2011) conducted their experiments with the exposure and a consecutive food task framed as two separate and unrelated parts, finding that a pictorial prime of overweight women motivated people, especially women, to choose unhealthy foods. Using a similar paradigm, Rodriguez et al. (2015) exposed participants to slideshows containing an image of an overweight (vs. thin vs. no) individual, after which a free snack product was to be chosen. Again, the prime and the selection task was unrelated, and again the overweight prime increased the likelihood of choosing the less healthy (i.e., more unhealthy) snack. As a final example of this stream of research, Manippa et al. (2019) used a classical priming paradigm (i.e., the prime was separate from the subsequent choice task) in their eye-tracking study on body shape influences on food choice, and found longer dwell times on high-calorie foods following an overweight prime.

Other studies have shown that people in general, and women in particular, decrease their intake of unhealthy food after viewing an overweight woman choosing a large quantity of the same food (McFerran et al., 2010a), and decrease their snack intake when served by an overweight (vs. thin) server if they are not on a diet (McFerran et al., 2010b). Two recent experimental eye-tracking studies found that women shift their visual attention towards healthier food menu options (Otterbring & Shams, 2019) and look longer at such meal alternatives (Huneke et al., 2015) after exposure to an overweight (vs. normal weight) female. However, unlike the former priming studies, the common denominator of these latter investigations seems to be that they all featured the stimulus person in connection to the food task and as a natural part of this task. For example, the female waitress in the Huneke et al. (2015) study, whose appearance was manipulated between conditions, was described as providing participants with the food menu from which they were subsequently instructed to choose a meal option.

Although the above studies suggest opposite outcomes depending on the exposure being presented as either related to the food task or not, the literature is not that conclusive. For instance, food choice-related exposure to a high-BMI (vs. low-BMI) server has been found to increase food intake, especially alcoholic beverages and desserts (Döring & Wansink, 2016), whereas exposure to a skinny sculpture not related to the food choice has been shown to increase the likelihood of choosing healthy food options (Brunner & Siegrist, 2012; Stöckli, Stämpfli, Messner, & Brunner, 2016). However, some of these studies also revealed significant gender differences, with Döring and Wansink (2016) noting that when served by an overweight waitress (vs. waiter), diners ordered fewer items compared to when served by a thin waitress (vs. waiter), suggesting that negative stereotypic effects may apply to females to a higher extent than to males. Considering this and the general tendency for women to show more social comparison in the food domain (e.g., Mori, Chaiken, & Pliner, 1987), the study reported herein focuses entirely on women.

In contrast to previous research on how exposure to other individuals can affect consumers' food choices, the present study is set in a novel context, namely grocery shopping. This context is special in that grocery shopping is typically characterized by little time and cognitive effort (e.g., Dickson & Sawyer, 1990; Hoyer, 1984), with

consumers attending to only a limited number of options and spending just a few seconds looking at each alternative (Gidlöf, Wallin, Dewhurst, & Holmqvist, 2013; Otterbring, Wästlund, & Gustafsson, 2016). Previous research on how the physical appearance and body type of others influences consumers' food-related decisions has focused mostly on consumer choice in a context where the food is thought to be consumed at the same time or shortly after the exposure to the stimulus person. Shopping for groceries presents a different task, where the food is consumed at a later stage and certain food products (like those we are focusing on; i.e., cereals) have a longer interpurchase cycle. According to Inman, Winer, and Ferraro (2009), it is more challenging to influence consumer choice on such products through external cues at the point-of-purchase compared to products with shorter interpurchase cycles, where consumers tend to be somewhat more impulsive, risk taking, and variety seeking in their product choices. In other words, they have less to lose with a suboptimal purchase in categories with shorter interpurchase cycles, because they do not have to live with the consequences for a long time if they find out that they purchased a suboptimal product in these categories. Hence, this begs the question as to whether previous results from restaurant settings can be generalized to a grocery shopping context.

### **Attention, Choice, and Holistic versus Explicit Health Cues**

As delineated above, the eye-tracking experiments by Huneke et al. (2015) and Otterbring and Shams (2019) jointly illustrate how visual attention is influenced by the perceived healthiness of others, with an increase in both the frequency and quantity of visual attention towards healthy meal alternatives after exposure to a woman whose appearance is associated with an unhealthy (vs. healthy) lifestyle. Supporting this notion, previous research has demonstrated how such stereotypic effects can affect people's attentional mechanisms (Eberhardt, Goff, Purdie, & Davies, 2004). One question that arises, however, is whether the shift will be towards products that are *actually* healthy (as indicated by explicit health cues such as nutrition labels) or products that are merely *perceived* as healthy in a holistic sense. In a grocery shopping context, attention directed towards product packaging is limited (Gidlöf et al., 2013) and only focused around a narrow set of elements (Orquin, Bagger, & Mueller Loose, 2013; Visschers, Hess, & Siegrist, 2010). For example, Orquin, Scholderer, and Jeppesen (2012) found that consumers mainly pay attention to brand elements, product category information, and pictorial elements on product packaging. Hence, at the point of purchase, nutrition information is in strong competition with other design elements. Research also shows that even though most consumers do recognize nutrition and health labels, few understand their exact meaning (Selsøe Sørensen et al., 2013). Moreover, when it comes to evaluating the healthiness of packaged food products, research indicates that consumers rely more heavily on holistic features incorporated in the packaging design compared to front-of-package nutrition labels (Orquin, 2014), and that many consumers classify foods simply according to a good/bad dichotomy (Rozin, Ashmore, & Markwith, 1996). Bartels, Tillack, and Jordan Lin (2018) found that general elements, such as product design features, garnered more visual attention than nutrition-related information, suggesting that shoppers use heuristics when looking for health-related information. This indicates that any shift in visual attention towards food options that signal healthiness may be more prominent for products whose packaging

design holistically convey the impression that they are healthy rather than products with explicit health cues. Thus, we hypothesize:

**H1:** Exposure to a female consumer whose appearance is associated with an unhealthy (vs. healthy) lifestyle will lead to a relative increase in women's visual attention towards seemingly healthy (vs. unhealthy) food options. However, this effect is stronger for options that holistically convey healthiness compared to options with explicit cues of healthiness (i.e., health labels).

Attention is one thing; choice behavior is another. All studies described above show some evidence of an appearance-induced effect on consumers' choice behavior. Because our experimental paradigm most closely resembles the studies by Huneke et al. (2015) and Otterbring and Shams (2019), our prediction is consistent with their general findings on choice. Hence, we hypothesize:

**H2:** Exposure to a female consumer whose appearance is associated with an unhealthy (vs. healthy) lifestyle will increase women's choice likelihood of seemingly healthy (vs. unhealthy) food options. However, this effect is stronger for options that holistically convey healthiness compared to options with explicit cues of healthiness (i.e., health labels).

Attention is a well-established antecedent of consumer choice (Orquin & Loose, 2013), and the relationship between attention to health-related information and healthy food choices has been empirically verified in a several studies. For instance, Peschel, Orquin, and Mueller Loose (2019) found attention towards organic labels to explain choice behavior of organic products, Van Loo et al. (2015) found attention to sustainability labels on coffee to carry over into coffee choices, and Gidlöf, Anikin, Lingonblad, and Wallin (2017) found visual attention to be the strongest predictor of purchase behavior in a supermarket environment. On that basis, we hypothesize:

**H3:** There is a conditional indirect effect between experimental condition and women's food choices through visual attention, with women exposed to a female consumer whose appearance is associated with an unhealthy (vs. healthy) lifestyle devoting a larger share of their visual attention towards seemingly healthy (vs. unhealthy) food options and, consequently, being more inclined to choose such food options. However, this effect is stronger for options that holistically convey healthiness compared to options with explicit cues of healthiness (i.e., health labels).

## Methodology

### Participants, Design, and Procedure

Ninety-six female undergraduates participated in the study, which was conducted as a lab-based eye-tracking experiment at a Scandinavian university. The study used a single factor between-subjects design, with experimental condition (healthy,

overweight, unhealthy lifestyle) as the between-subjects factor. Cell sizes ranged from 30 to 34, which is similar to the typical number of participants per condition in previous eye-tracking studies relying on between-subjects designs (e.g., Gidlöf et al., 2013; Otterbring, Shams, Wästlund, & Gustafsson, 2013; Wästlund, Otterbring, Gustafsson, & Shams 2015). After a calibration procedure of the eye-tracking equipment (Tobii X120), participants were randomly assigned to one of the experimental conditions and watched a brief video recording (approximately 15–20 s) featuring another female consumer standing in front of a supermarket shelf with cereals. The female consumer was the same person in all conditions and was of normal weight. However, her appearance and body type was manipulated between conditions such that she was perceived as being either healthy and of normal weight, overweight (through soft filling materials at the abdominal and thighs areas covered by clothing), or of normal weight but with signs meant to boost the impression of a potentially unhealthy lifestyle (heavy makeup, dark eye lashes, a neck tattoo, and visible piercings). Next, participants were exposed to a static image depicting a supermarket shelf with a large assortment of cereals (21 unique cereal alternatives and 32 packages in total) and were asked to choose the option they could consider buying (see Fig. 1 for a pictorial representation of the shelf). No time limit was set for this task.

Two of the authors independently coded whether each cereal alternative available in the shelf looked either healthy or unhealthy. Interrater reliability was high (86%), i.e., an identical categorization was made in 18 out of the 21 cereal cases. Disagreements were solved through discussion and were complemented with a separate validation study on an independent sample of 30 participants (27% female) to ensure that their ratings were similar to the classification made by the authors, which was found to be the case.<sup>1</sup> This perceived healthiness measure was used because it has been common in previous related research (e.g., McFerran et al., 2010a; Otterbring, 2018; Otterbring & Shams, 2019) and because a packaged product can convey the impression of being healthy without necessarily living up to that perception in terms of its ingredients or calorie content. To get a more objective measure of healthiness, nine of the cereal alternatives available included the keyhole label. The authors' ratings of perceived healthiness of the cereal alternatives were significantly correlated with ( $r = .75, p < .001$ ), but still different from, whether these cereal options contained the keyhole label or not. Therefore, both these categorizations were used in the analyses to examine whether our experimental condition had a stronger influence either on products with an

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<sup>1</sup> Participants in the validation study viewed each of the cereal options included in the main study and rated their healthiness on a single-item scale (1 = unhealthy; 7 = healthy). Relying on the same categorization as above, an index of the unhealthy cereal options yielded a high reliability ( $\alpha = .90$ ). The same applied to the index of the healthy cereal alternatives ( $\alpha = .92$ ). A repeated measures ANOVA revealed that the healthy cereal options ( $M = 4.35, SD = .83$ ) were perceived as significantly healthier than the unhealthy cereal options ( $M = 2.56, SD = .81; F(1, 27) = 121.57, p < .001, \eta^2 = .82$ ). Furthermore, the unhealthy cereal options were rated as significantly more unhealthy than the scale midpoint of 4 ( $t(27) = -9.34, p < .001$ ), whereas the healthy cereal alternatives were rated as significantly more healthy than the scale midpoint ( $t(27) = 2.24, p < .05$ ), thus indicating an appropriate classification. Two extreme cases were removed from the analyses because they scored beyond two standard deviations from the mean on the index of healthy cereal options (cf. Otterbring, Löfgren, & Lestelius, 2014a), i.e., these participants rated *all* cereals as very unhealthy, as reflected by their consistent use of the two lowest response alternatives (i.e., 1 or 2). Males and females did not differ significantly in their responses and the inclusion of participant gender as a between-subjects factor did not change the nature and significance of the results.



Fig. 1. Cereal shelf used in the experiment

explicit external cue associated with health (i.e., the keyhole label) or on products whose packaging design holistically manages to convey the impression that they are healthy.

## Measures

As the variables of interest, we relied on participants' visual attention towards cereal alternatives classified as healthy and unhealthy—using each of our categorization methods—and participants' cereal choices. We used participants' average number of observations of cereals, categorized as either healthy or unhealthy, as our visual attention measures, because observation count is a commonly used eye-tracking metric (e.g., Otterbring, Wästlund, Gustafsson, & Shams, 2014b; Wästlund, Shams, & Otterbring, 2018). Thus, the observation counts of the 12 cereal alternatives perceived to be healthy were averaged to create a variable reflecting the participants' visual attention towards such options ( $\alpha = .85$ ), whereas observation counts of the 9 cereal alternatives perceived to be unhealthy were averaged to create a variable reflecting the participants' visual attention towards these latter options ( $\alpha = .77$ ). Likewise, observation counts of the 9 cereal alternatives with the keyhole label were averaged to compute a variable indicating the participants' visual attention towards keyhole products ( $\alpha = .81$ ), whereas observation counts of the 12 alternatives without this label were collapsed to create a variable indicating the participants' visual attention towards such options ( $\alpha = .81$ ).

## Pretest

A pretest on 88 female undergraduates was conducted to ensure that our manipulation behaved as intended. Participants were randomly assigned to one of the experimental conditions (healthy, overweight, unhealthy lifestyle), viewed the video recording of the consumer, and were subsequently asked to indicate their agreement on the statement “The woman in the recording has a healthy lifestyle” (1 = strongly disagree; 7 = strongly agree). Next, they were asked to indicate, using a free-text response format,



why they did or did not agree with this statement. Of the entire sample, we got responses from 86 and 49 participants on the healthy lifestyle item and the free-text item, respectively.

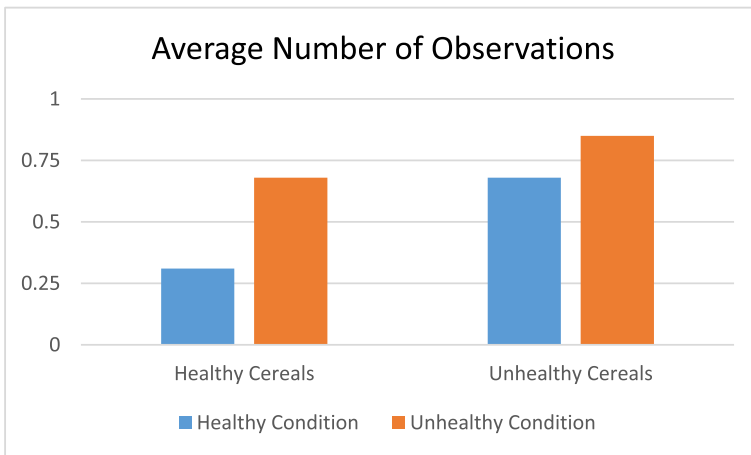
A one-way ANOVA on the healthy lifestyle item found a statistically significant difference between conditions ( $F(2, 83) = 10.33, p < .001, \eta_p^2 = .20$ ). Follow-up planned contrasts revealed that participants in the healthy condition ( $M = 4.67, SD = .78$ ) perceived the consumer as having a significantly healthier lifestyle compared to participants in the overweight and unhealthy lifestyle conditions ( $M = 3.78, SD = .97; t(83) = 4.27, p < .001$ ), whereas participants in these two latter conditions did not differ significantly ( $t(83) = 1.68, p = .10$ ). In an attempt to provide further qualitative support for a successful manipulation, we coded participants' free-text responses into two distinct categories. The first category was meant to reflect whether the description provided included aspects linked to healthiness (e.g., the person looked healthy, physically fit, slender, sound). Descriptors linked to such aspects were coded as 1 whereas descriptors not associated with healthiness (e.g., the person looked fat, chubby, unfit, ragged, looked like a smoker, party-goer) were coded as 0. A Pearson's chi-square analysis on 2 (healthy: yes, no)  $\times$  3 (condition: health, overweight, unhealthy lifestyle) crosstabs found a significant effect on this variable ( $\chi^2(2, N = 49) = 30.96, p < .001, V = .79$ ). Follow-up orthogonal contrasts revealed that descriptions using health-related words were significantly more apparent among participants in the healthy condition (85%) compared to participants in the overweight and unhealthy conditions (7%;  $\chi^2(1, N = 49) = 30.42, p < .001, V = .79$ ), whereas health-related descriptions did not differ significantly between these two latter conditions ( $\chi^2(1, N = 29) = 2.01, p = .48, V = .26$ ). Thus, our pretest indicates that our manipulation was successful in that participants could consistently spot differences on various health-related aspects as a function of experimental condition, with responses in the healthy condition differing from responses in the other two conditions.

## Results

### Visual Attention

Participants in the overweight and unhealthy lifestyle conditions did not differ either with respect to visual attention towards the healthy and unhealthy cereal alternatives or in terms of their actual cereal choices. Therefore, consistent with the pretest results, these conditions were combined into a joint unhealthy condition to facilitate parsimonious analyses. Next, we conducted a 2 (condition: healthy, unhealthy)  $\times$  2 (cereals: healthy, unhealthy) mixed ANOVA, with experimental condition as the between-subjects factor and cereal option as the within-subjects factor. Our first analysis corresponds to the *perceived* healthiness of the products (i.e., whether their packaging design holistically communicated healthiness) and the second analysis corresponds to the *actual* healthiness of the products (here conceptualized as whether or not they contained the explicit health cue).

For perceived healthiness, the hypothesized two-way interaction emerged ( $F(1, 94) = 3.85, p = .05, \eta_p^2 = .04$ ). As depicted in Fig. 2, participants' visual attention towards the seemingly unhealthy cereal alternatives did not differ significantly between the



**Fig. 2.** Average number of observations towards healthy and unhealthy cereal alternatives as a function of experimental condition

healthy ( $M = .68$ ,  $SD = .53$ ) and unhealthy condition ( $M = .85$ ,  $SD = .49$ ;  $F(1, 94) = 2.56$ ,  $p = .11$ ,  $\eta^2 = .03$ ). However, participants in the unhealthy condition ( $M = .68$ ,  $SD = .61$ ) had a significantly larger number of observations towards the cereal alternatives perceived to be healthy compared to participants in the healthy condition ( $M = .31$ ,  $SD = .36$ ;  $F(1, 94) = 10.03$ ,  $p = .002$ ,  $\eta^2 = .10$ ). The main effect of experimental condition was significant ( $F(1, 94) = 7.22$ ,  $p = .009$ ,  $\eta^2 = .07$ ) as was the main effect of cereals ( $F(1, 94) = 28.62$ ,  $p < .001$ ,  $\eta^2 = .23$ ). Thus, in general participants looked at more cereal alternatives in the unhealthy ( $M = 1.53$ ,  $SD = .99$ ) relative to the healthy condition ( $M = .99$ ,  $SD = .83$ ) and looked more at seemingly unhealthy ( $M = .79$ ,  $SD = .51$ ) versus healthy ( $M = .56$ ,  $SD = .57$ ) cereal alternatives.

A similar analysis on whether experimental condition influenced participants' visual attention towards cereal alternatives with (vs. without) the keyhole label only found a main effect of condition ( $F(1, 94) = 8.01$ ,  $p = .006$ ,  $\eta^2 = .08$ ) and a main effect of cereals ( $F(1, 94) = 56.14$ ,  $p < .001$ ,  $\eta^2 = .37$ ). Thus, in general participants looked at more cereal alternatives in the unhealthy ( $M = 1.46$ ,  $SD = 1.01$ ) relative to the healthy condition ( $M = .89$ ,  $SD = .78$ ) and they looked more at cereal alternatives without ( $M = .80$ ,  $SD = .55$ ) versus with ( $M = .47$ ,  $SD = .50$ ) the keyhole label. However, unlike the result on perceived healthiness above, the interaction effect was nonsignificant ( $F < 1$ ). Taken together, and in line with **HI**, this suggests that our experimental manipulation had a stronger impact on participants' visual attention towards a cereal package that subjectively, through its packaging design, communicated the perception that it is healthy compared to a package with a more objective sign of healthiness (i.e., the keyhole label).

### Choice Behavior

To examine whether experimental condition influenced participants cereal choices, we conducted a Pearson's chi-square analysis on 2 (condition: healthy, unhealthy)  $\times$  2 (cereal: healthy, unhealthy) crosstabs. This analysis found no significant difference in participants' cereal choices as a function of experimental condition ( $\chi^2(1, N = 96) = 1.04$ ,  $p = .30$ ,  $V = .10$ ). However, there was at least directional support for the prediction

that a larger share of participants in the unhealthy condition (61%) made cereal choices *perceived* to be healthy compared to participants in the healthy condition (50%).

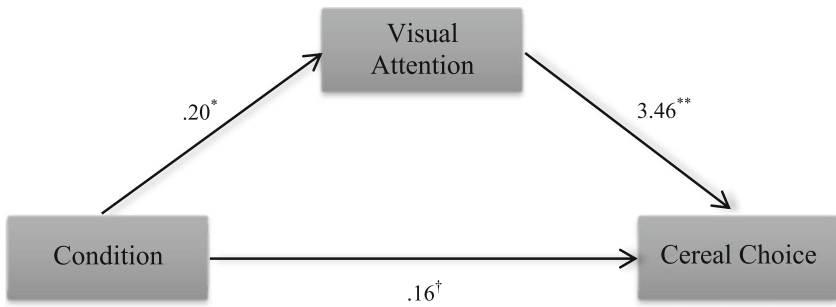
A similar analysis on whether experimental condition influenced participants' likelihood to choose cereals with (vs. without) the keyhole label also found no significant difference across conditions ( $\chi^2(1, N = 96) = 1.55, p = .21, V = .13$ ). In fact, the proportion of participants selecting a cereal alternative with the keyhole label was directionally smaller in the unhealthy condition (17%) compared to the healthy condition (28%). In sum, although participants were directionally more inclined to choose packaged products that were perceived to be healthy after exposure to a consumer whose appearance is associated with an unhealthy (vs. healthy) lifestyle, the difference between conditions was not statistically significant. This leaves **H2** unsupported.

### Mediation Analyses

To investigate whether there would be an indirect effect between experimental condition and participants' food choices through their visual attention, we conducted a simple mediation analysis (PROCESS Model 4) with condition (healthy, unhealthy) as the predictor, a difference score (cf. Otterbring, 2019) between visual attention directed towards healthy and unhealthy cereal alternatives as the mediator, and cereal choices (unhealthy, healthy) as the outcome variable. We first conducted the analysis based on the perceived healthiness of the different cereal options and then compared these results with those obtained for the cereal options with (vs. without) the keyhole label.

Consistent with the ANOVA results, there was a significant effect of condition on participants' visual attention ( $b = .20, t = 1.96, p = .05$ ), with participants in the unhealthy condition devoting a relatively larger share of their visual attention towards healthy (vs. unhealthy) cereal alternatives compared to participants in the healthy condition. Moreover, the effect that the visual attention measure had on participants' cereal choices was statistically significant ( $b = 3.46, Z = 4.31, p < .001$ ), meaning that participants who looked more at healthy (vs. unhealthy) cereal alternatives were more likely to choose a healthy cereal option. Finally, although the direct effect of experimental condition on participants' cereal choices was nonsignificant ( $b = .16, Z = .32, p = .75$ ), a bootstrap procedure that generated a sample size of 5,000 bootstrap samples revealed that the conditional indirect effect was statistically significant. Indeed, a 95% confidence interval (CI) found that the effect that experimental condition had on participants' cereal choices was indirect through their visual attention (95% CI = [.08, 1.53]; see Fig. 3).

A similar analysis using a difference score wherein visual attention towards the cereals without the keyhole labels was subtracted from visual attention towards the cereals with this label found no effect of experimental condition on participants' visual attention ( $b < .001, t = .005, p > .99$ ). The direct effect of experimental condition on participants' cereal choices was also nonsignificant ( $b = -.91, t = -1.54, p = .12$ ), as was the conditional indirect effect of visual attention between condition and cereal choices (95% CI = [-.62, .65]). Consistent with **H3**, this again indicates that, following our experimental manipulation, the design features of a packaged product (i.e., whether it is holistically perceived as healthy or not) has a stronger impact on participants' food-related decision-making processes than external cues such as health labels.



†  $p > .10$

\*  $p = .05$

\*\*  $p < .001$

**Fig. 3.** The impact of experimental condition on cereal choices through the conditional indirect effect of visual attention

## Discussion

The results of this study suggest that the health status of another consumer influences individuals' visual attention towards certain food products. In particular, our eye-tracking experiment revealed that prior exposure to a seemingly unhealthy (vs. healthy) consumer resulted in a relative increase in participants' visual attention towards products perceived to be healthy (vs. unhealthy), which in turn prompted cereal choices deemed to be healthier. This effect was stronger for products that holistically, through their design features, managed to convey the impression that they are healthy rather than products that rely on explicit cues linked to healthiness (i.e., the keyhole label).

## Theoretical Implications

The current findings generalize previous related research to other consumer contexts and person characteristics. Instead of investigating how the body type and appearance of a waitress or a spokesperson for a restaurant may influence consumers' visual attention and choice behavior (Huneke et al., 2015; Otterbring & Shams, 2019), our study focused on whether another consumer can affect people's decision-making processes for packaged food products in a grocery store context. Because both our experimental conditions linked to an unhealthy lifestyle (i.e., an overweight consumer and a consumer of normal weight whose appearance still communicated certain unhealthy features) produced similar effects on attention and choice, this indicates that our findings are not simply a consequence of the overweight stereotype, but rather represent a more general bias occurring after exposure to aversive, as opposed to appetitive, stimuli (cf. Baumeister, Bratslavsky, Finkenauer, & Vohs, 2001).<sup>2</sup> Moreover, given the recent importance put on replications in general (Perone, 2019; Tincani & Travers, 2019) and on conceptual replications in particular, due to their superior ability

<sup>2</sup> This assertion does not, however, imply that all individuals perceive such stimuli as aversive, although our results suggest that this may be the case at the aggregate level. We thank an anonymous reviewer for bringing up this point.

to progress and test theory across methods (Crandall & Sherman, 2016; Zwaan, Etz, Lucas, & Donnellan, 2017), our study can be seen as a conceptual replication of prior work, conducted in another consumer context (i.e., a grocery store instead of a restaurant) and with appearance manipulated on another social unit (i.e., a consumer instead of an employee).

Another contribution of the present research is related to the contrast between explicit and holistic health cues. Given that our classification of perceived healthiness was similar to the categorization made by an independent sample of participants, wherein some cereals were perceived to be healthy without explicit health cues, this consistency indicates that the perceived healthiness of the cereals was at least in part contingent on the ability of the product packaging to convey healthiness holistically. In support of this notion, recent research has shown that front-of-package labels have limited helpfulness in guiding consumers towards healthy cereal choices (Siegrist, Hartmann, & Lazzarini, 2019), that simple explicit cues utilized to convey healthiness are not efficient (Orquin, Bagger, Lahm, Grunert, & Scholderer, 2020), and that visual cues, such as images and colors, are more important than informational cues, such as labels and easily understandable words, in guiding healthy food choices (Vila-Lopéz, Küster-Boluda, & Sarabia-Sánchez, 2017).

A final theoretical implication is the inherent strengths associated with process tracing techniques. Indeed, technological tools, such as those involved in eye-tracking methodology, enable scholars to study not only the final decision in terms of product choices or purchases, but also help them in elucidating the perceptual process preceding such outcome-based metrics. Compared to other process tracing methods (e.g., think-aloud protocols), eye tracking is also superior in precision of measurement of both spatial and temporal features and is less influenced by response and social desirability biases (Glaholt & Reingold, 2011; Russo, 2019), indicating that this technique is particularly useful in scholarly studies on stereotypes and implicit biases.

## Practical Implications

From a practical point of view, the present findings suggest that others' unhealthy appearances can increase consumers' incentives to purchase seemingly healthy foods through a perceptual process by which they assess the product packaging holistically and base their product choices on the overall impression of healthiness that the products convey. Thus, to promote purchases of packaged products with a specific health-related connotation, our results suggest that it may not be enough to simply add explicit health cues. Instead, our findings indicate that the focus should be on the more generic features that the packaging signals to its consumers (as healthy or not). An important implication for brand owners, advertisers, and marketers is therefore that considerations regarding packaging design should include a more overarching visual message, which needs to be congruent with the way consumers subjectively perceive the product in terms of the associations it evokes. Another strategy is to improve the ability of the label to capture visual attention. Studies have shown positive effects on visual attention by simply moving packaging elements, such as explicit health cues, closer to the center of the package (Graham, Orquin, & Visschers, 2012), increasing their size and saliency (Peschel et al., 2019), or combining health labels with other nutritional information (Bialkova, Grunert, & van Trijp, 2013). Whether such "low-cost" strategies of

capturing visual attention would be equally effective as with a packaging design that historically signals healthiness deserve further scholarly investigation.

It is well-known that an increasing proportion of individuals, throughout the world, are becoming overweight and obese (Smith & Smith, 2016). Although our study, viewed in isolation, obviously cannot cure the so-called obesity epidemic (Caballero, 2007; Hill & Peters, 1998), our findings nevertheless offer some implications for policy makers in the health domain. In particular, our results indicate that explicit health cues on product packaging, such as the keyhole label, should be an integrated and prominent part of an overarching healthy design, because holistic health cues in themselves give no assurance of a product's objective healthiness, thereby potentially misleading consumers.

## Limitations and Future Research

The present findings corroborate research showing how goal orientation guides visual attention towards products that fit with the given goal (Orquin et al., 2013). However, goal orientation has also been shown to increase scrutiny of products and thereby visual attention towards individual design features such as nutritional information and health labels (Van Loo et al., 2015; Visschers et al., 2010). One possible explanation as for why this was not seen in the present study is that cereals are low-involvement products, which may imply that consumers simply do not care enough to make a thorough visual inspection of the packaging surrounding such products. Similar to Bartels et al. (2018), overall design features perceived to be healthy may therefore have been viewed as “good-enough” indicators of a healthy product, even though that is not always the case. Future research could examine whether products at different involvement levels can benefit from different approaches to conveying healthiness. For instance, a holistic packaging design communicating healthiness may be better suited for low-involvement products, whereas explicit health cues and nutrition labels may be more appropriate for high-involvement products. In addition, cereals have longer interpurchase cycles, which tend to decrease risk-taking tendencies and variety seeking in consumer choice situations (Inman et al., 2009). This may explain why we did not find a direct effect of our experimental manipulation on participants' choice behavior. In other words, we suspect the longer interpurchase cycle of cereals may have made participants more prone to stick to the cereal product that they typically choose, because this option can be perceived as a “safe bet” on something they know that they like. Future research should examine whether involvement levels (high vs. low) and the specific interpurchase cycle of the products to be consumed (short vs. long) may moderate the effectiveness of either holistic design elements signaling healthiness or explicit health cues as a function of seeing other individuals with an unhealthy (vs. healthy) appearance.

The representativeness of our sample and the pooling of participants constitute potential limitations in the present research. Because our study focused entirely on female participants, future research should include male participants in order to better inform policy makers in this area. It is also worth mentioning the unequal sample sizes across the analyzed groups as a possible shortcoming. The pooling of participants in the overweight and unhealthy lifestyle conditions into a joint unhealthy condition created a

larger group compared to the healthy condition. Although such collapsing is common in experimental research (e.g., Griskevicius et al., 2009), it creates an unbalanced design, which has certain statistical implications. An alternative could have been to recruit a roughly equal number of participants in the healthy condition as in the two unhealthy conditions combined (cf. Otterbring & Sela, 2020). However, given the theoretical basis justifying the pooling of participants in this specific study, and the common approach of doing so in psychological science, we do not see our use of a joint unhealthy condition as particularly problematic.

## Conclusion

The present study investigated whether the physical appearance of another consumer influences people's visual attention and choice behavior in a grocery shopping context. The results revealed that seeing a person with an unhealthy (vs. healthy) appearance lead to a relative increase in individuals' attention towards seemingly healthy (vs. unhealthy) food products, which ultimately stimulated food choices perceived to be healthier. This effect was particularly powerful for products that holistically, through their packaging design, conveyed healthiness and had a weaker impact on products with explicit cues linked to healthiness (i.e., the keyhole label). The findings have clear implications for both packaging design and health policy. If selling healthy food products is the goal, health cues should be a part of the overarching packaging design and not just a label in the corner of the package.

## Compliance with Ethical Standards

**Conflict of Interest** All authors approved the manuscript prior to submission and jointly declare that they have no conflicts of interest.

## References

- Argo, J. J., Dahl, D. W., & Manchanda, R. V. (2005). The influence of a mere social presence in a retail context. *Journal of Consumer Research*, 32(2), 207–212.
- Argo, J. J., Dahl, D. W., & Morales, A. C. (2008). Positive consumer contagion: Responses to attractive others in a retail context. *Journal of Marketing Research*, 45(6), 690–701.
- Bartels, M., Tillack, K., & Jordan Lin, C.-T. (2018). Communicating nutrition information at the point of purchase: An eye-tracking study of shoppers at two grocery stores in the United States. *International Journal of Consumer Studies*, 42(5), 557–565.
- Baumeister, R. F., Bratslavsky, E., Finkenauer, C., & Vohs, K. D. (2001). Bad is stronger than good. *Review of General Psychology*, 5(4), 323–370.
- Bialkova, S., Grunert, K. G., & van Trijp, H. (2013). Standing out in the crowd: The effect of information clutter on consumer attention for front-of-pack nutrition labels. *Food Policy*, 41, 65–74.
- Brunner, T. A., & Siegrist, M. (2012). Reduced food intake after exposure to subtle weight related cues. *Appetite*, 58(3), 1109–1112.
- Caballero, B. (2007). The global epidemic of obesity: an overview. *Epidemiologic Reviews*, 29(1), 1–5.
- Campbell, M. C., & Mohr, G. S. (2011). Seeing is eating: How and when activation of a negative stereotype increases stereotype-conducive behavior. *Journal of Consumer Research*, 38(3), 431–444.
- Cramer, P., & Steinwert, T. (1998). Thin is good, fat is bad: How early does it begin? *Journal of Applied Developmental Psychology*, 19(3), 429–451.

- Crandall, C. S., D'Anello, S., Sakalli, N., Lazarus, E., Nejtardt, G. W., & Feather, N. T. (2001). An attribution-value model of prejudice: Anti-fat attitudes in six nations. *Personality & Social Psychology Bulletin*, 27(1), 30–37.
- Crandall, C. S., & Sherman, J. W. (2016). On the scientific superiority of conceptual replications for scientific progress. *Journal of Experimental Social Psychology*, 66, 93–99.
- Crusco, A. H., & Wetzell, C. G. (1984). The Midas touch: The effects of interpersonal touch on restaurant tipping. *Personality & Social Psychology Bulletin*, 10(4), 512–517.
- Cruwys, T., Bevelander, K. E., & Hermans, R. C. (2015). Social modeling of eating: A review of when and why social influence affects food intake and choice. *Appetite*, 86, 3–18.
- Dallery, J., Kurti, A., & Erb, P. (2015). A new frontier: integrating behavioral and digital technology to promote health behavior. *The Behavior Analyst*, 38(1), 19–49.
- Dickson, P. R., & Sawyer, A. G. (1990). The price knowledge and search of supermarket shoppers. *Journal of Marketing*, 54(3), 42–53.
- Döring, T., & Wansink, B. (2016). The waiter's weight. *Environment & Behavior*, 49(2), 192–214.
- Duguid, M. M., & Thomas-Hunt, M. C. (2015). Condoning stereotyping? How awareness of stereotyping prevalence impacts expression of stereotypes. *Journal of Applied Psychology*, 100(2), 343–359.
- Eberhardt, J. L., Goff, P. A., Purdie, V. J., & Davies, P. G. (2004). Seeing black: Race, crime, and visual processing. *Journal of Personality & Social Psychology*, 87(6), 876–893.
- Fagerström, A., Pawar, S., Sigurdsson, V., Foxall, G. R., & Yani-de-Soriano, M. (2017). That personal profile image might jeopardize your rental opportunity! On the relative impact of the seller's facial expressions upon buying behavior on Airbnb™. *Computers in Human Behavior*, 72, 123–131.
- Fenko, A., Nicolaas, I., & Galetzka, M. (2018). Does attention to health labels predict a healthy food choice? An eye-tracking study. *Food Quality & Preference*, 69, 57–65.
- Gao, Y. L., & Mattila, A. S. (2017). The impact of stereotyping on consumers' food choices. *Journal of Business Research*, 81, 80–85.
- Gallace, A., & Spence, C. (2010). The science of interpersonal touch: an overview. *Neuroscience & Biobehavioral Reviews*, 34(2), 246–259.
- Gidlöf, K., Anikin, A., Lingonblad, M., & Wallin, A. (2017). Looking is buying. How visual attention and choice are affected by consumer preferences and properties of the supermarket shelf. *Appetite*, 116, 29–38.
- Gidlöf, K., Wallin, A., Dewhurst, R., & Holmqvist, K. (2013). Using eye tracking to trace a cognitive process: Gaze behaviour during decision making in a natural environment. *Journal of Eye Movement Research*, 6(1), 1–14.
- Glaholt, M. G., & Reingold, E. M. (2011). Eye movement monitoring as a process tracing methodology in decision making research. *Journal of Neuroscience, Psychology, & Economics*, 4(2), 125–146.
- Graham, D. J., Orquin, J. L., & Visschers, V. H. M. (2012). Eye tracking and nutrition label use: A review of the literature and recommendations for label enhancement. *Food Policy*, 37(4), 378–382.
- Greenwald, A. G., & Krieger, L. H. (2006). Implicit bias: Scientific foundations. *California Law Review*, 94(4), 945–967.
- Griskevicius, V., Goldstein, N. J., Mortensen, C. R., Sundie, J. M., Cialdini, R. B., & Kenrick, D. T. (2009). Fear and loving in Las Vegas: Evolution, emotion, and persuasion. *Journal of Marketing Research*, 46(3), 384–395.
- Griskevicius, V., Tybur, J. M., & Van den Bergh, B. (2010). Going green to be seen: Status, reputation, and conspicuous conservation. *Journal of Personality & Social Psychology*, 98(3), 392–404.
- Hill, J. O., & Peters, J. C. (1998). Environmental contributions to the obesity epidemic. *Science*, 280(5368), 1371–1374.
- Hoyer, W. D. (1984). An examination of consumer decision making for a common repeat purchase product. *Journal of Consumer Research*, 11(3), 822–829.
- Huneke, T., Benoit, S., Shams, P., & Gustafsson, A. (2015). Does service employees' appearance affect the healthiness of food choice? *Psychology & Marketing*, 32(1), 94–106.
- Inman, J. J., Winer, R. S., & Ferraro, R. (2009). The interplay among category characteristics, customer characteristics, and customer activities on in-store decision making. *Journal of Marketing*, 73(5), 19–29.
- Johnston, L. (2002). Behavioral mimicry and stigmatization. *Social Cognition*, 20(1), 18–35.
- Jolls, C., & Sunstein, C. R. (2006). The law of implicit bias. *California Law Review*, 94, 969–996.
- Kim, E., Tang, L. R., Meusel, C., & Gupta, M. (2018). Optimization of menu-labeling formats to drive healthy dining: An eye tracking study. *International Journal of Hospitality Management*, 70, 37–48.
- Larsen, N. M., Sigurdsson, V., & Breivik, J. (2017). The use of observational technology to study in-store behavior: Consumer choice, video surveillance, and retail analytics. *The Behavior Analyst*, 40(2), 343–371.



- Luck, M., & Benkenstein, M. (2015). Consumers between supermarket shelves: The influence of interpersonal distance on consumer behavior. *Journal of Retailing & Consumer Services*, 26, 104–114.
- Manippa, V., van der Laan, L. N., Brancucci, A., & Smeets, P. A. M. (2019). Health body priming and food choice: An eye tracking study. *Food Quality & Preference*, 72, 116–125.
- McFerran, B., Dahl, D. W., Fitzsimons, G. J., & Morales, A. C. (2010a). I'll have what she's having: Effects of social influence and body type on the food choices of others. *Journal of Consumer Research*, 36(6), 915–929.
- McFerran, B., Dahl, D. W., Fitzsimons, G. J., & Morales, A. C. (2010b). Might an overweight waitress make you eat more? How the body type of others is sufficient to alter our food consumption. *Journal of Consumer Psychology*, 20(2), 146–151.
- Menon, R. V., Sigurdsson, V., Larsen, N. M., Fagerström, A., & Foxall, G. R. (2016). Consumer attention to price in social commerce: Eye tracking patterns in retail clothing. *Journal of Business Research*, 69(11), 5008–5013.
- Mori, D., Chaiken, S., & Pliner, P. (1987). "Eating lightly" and the self-presentation of femininity. *Journal of Personality & Social Psychology*, 53(4), 693–702.
- Orquin, J. L. (2014). A Brunswik lens model of consumer health judgments of packaged foods. *Journal of Consumer Behaviour*, 13(4), 270–281.
- Orquin, J. L., Bagger, M. P., Lahm, E. S., Grunert, K. G., & Scholderer, J. (2020). The visual ecology of product packaging and its effects on consumer attention. *Journal of Business Research*.
- Orquin, J. L., Bagger, M. P., & Mueller Loose, S. (2013). Learning affects top down and bottom up modulation of eye movements in decision making. *Judgment & Decision Making*, 8(6), 700–716.
- Orquin, J. L., & Loose, S. M. (2013). Attention and choice: A review on eye movements in decision making. *Acta Psychologica*, 144(1), 190–206.
- Orquin, J.L., Scholderer, J., & Jeppesen, H. (2012). What you see is what you buy: How saliency and surface size of packaging elements affect attention and choice. Paper presented at the Society for Advancement of Behavioural Economics (SABE) conference.
- Otterbring, T. (2020). Appetite for destruction: Counterintuitive effects of attractive faces on people's food choices. *Psychology & Marketing*.
- Otterbring, T. (2017). Smile for a while: the effect of employee-displayed smiling on customer affect and satisfaction. *Journal of Service Management*, 28(2), 284–304.
- Otterbring, T. (2018). Healthy or wealthy? Attractive individuals induce sex-specific food preferences. *Food Quality & Preference*, 70, 11–20.
- Otterbring, T. (2019). Time orientation mediates the link between hunger and hedonic choices across domains. *Food Research International*, 120, 124–129.
- Otterbring, T., Löfgren, M., & Lestelius, M. (2014a). Let there be light! An initial exploratory study of whether lighting influences consumer evaluations of packaged food products. *Journal of Sensory Studies*, 29(4), 294–300.
- Otterbring, T., & Lu, C. (2018). Clothes, condoms, and customer satisfaction: The effect of employee mere presence on customer satisfaction depends on the shopping situation. *Psychology & Marketing*, 35(6), 454–462.
- Otterbring, T., Ringler, C., Sirianni, N. J., & Gustafsson, A. (2018). The Abercrombie & Fitch effect: The impact of physical dominance on male customers' status-signaling consumption. *Journal of Marketing Research*, 55(1), 69–79.
- Otterbring, T., & Sela, Y. (2020). Sexually arousing ads induce sex-specific financial decisions in hungry individuals. *Personality and Individual Differences*, 152, 109576.
- Otterbring, T., & Shams, P. (2019). Mirror, mirror, on the menu: Visual reminders of overweight stimulate healthier meal choices. *Journal of Retailing & Consumer Services*, 47, 177–183.
- Otterbring, T., Shams, P., Wästlund, E., & Gustafsson, A. (2013). Left isn't always right: placement of pictorial and textual package elements. *British Food Journal*, 115(8), 1211–1225.
- Otterbring, T., Wästlund, E., & Gustafsson, A. (2016). Eye-tracking customers' visual attention in the wild: Dynamic gaze behavior moderates the effect of store familiarity on navigational fluency. *Journal of Retailing & Consumer Services*, 28, 165–170.
- Otterbring, T., Wästlund, E., Gustafsson, A., & Shams, P. (2014b). Vision (im) possible? The effects of in-store signage on customers' visual attention. *Journal of Retailing & Consumer Services*, 21(5), 676–684.
- Perone, M. (2019). How I learned to stop worrying and love replication failures. *Perspectives on Behavior Science*, 42(1), 91–108.
- Peschel, A. O., Orquin, J. L., & Mueller Loose, S. (2019). Increasing consumers' attention capture and food choice through bottom-up effects. *Appetite*, 132, 1–7.

- Rafacz, S. D. (2019). Healthy eating: Approaching the selection, preparation, and consumption of healthy food as choice behavior. *Perspectives on Behavior Science*, 42(3), 647–674.
- Reingen, P. H., & Kernan, J. B. (1993). Social perception and interpersonal influence: Some consequences of the physical attractiveness stereotype in a personal selling setting. *Journal of Consumer Psychology*, 2(1), 25–38.
- Rodriguez, A. C. I., Finch, L. E., Buss, J., Guardino, C. M., & Tomiyama, A. J. (2015). An experimental field study of weight salience and food choice. *Appetite*, 89, 215–218.
- Rozin, P., Ashmore, M., & Markwith, M. (1996). Lay American conceptions of nutrition: Dose insensitivity, categorical thinking, contagion, and the monotonic mind. *Health Psychology*, 15(6), 438–447.
- Russo, J. E. (2019). Eye fixations as a process trace. In M. Schulte-Mecklenberg, A. Kuhberger, & J. G. Johnson (Eds.), *A handbook of process tracing methods* (pp. 4–26). New York, NY: Routledge.
- Selsøe Sørensen, H., Holm, L., Møgelvang-Hansen, P., Barratt, D., Qvistgaard, F., & Smith, V. (2013). Consumer understanding of food labels: toward a generic tool for identifying the average consumer: Report from a Danish exploration. *International Review of Retail, Distribution & Consumer Research*, 23(3), 291–304.
- Siegrist, M., Hartmann, C., & Lazzarini, G. A. (2019). Healthy choice label does not substantially improve consumers' ability to select healthier cereals: Results of an online experiment. *British Journal of Nutrition*, 121(11), 1313–1320.
- Sigurdsson, V., Larsen, N. M., & Gunnarsson, D. (2014). Healthy food products at the point of purchase: An in-store experimental analysis. *Journal of Applied Behavior Analysis*, 47(1), 151–154.
- Sigurdsson, V., Menon, R. V., & Fagerstrøm, A. (2017). Online healthy food experiments: capturing complexity by using choice-based conjoint analysis. *The Behavior Analyst*, 40(2), 373–391.
- Small, D. A., & Verrochi, N. M. (2009). The face of need: Facial emotion expression on charity advertisements. *Journal of Marketing Research*, 46(6), 777–787.
- Smith, K. B., & Smith, M. S. (2016). Obesity statistics. *Primary Care: Clinics in Office Practice*, 43(1), 121–135.
- Söderlund, M. (2016). Employee mere presence and its impact on customer satisfaction. *Psychology & Marketing*, 33(6), 449–464.
- Stöckli, S., Stämpfli, A. E., Messner, C., & Brunner, T. A. (2016). An (un)healthy poster: When environmental cues affect consumers' food choices at vending machines. *Appetite*, 96, 368–374.
- Tincani, M., & Travers, J. (2019). Replication research, publication bias, and applied behavior analysis. *Perspectives on Behavior Science*, 42(1), 59–75.
- Van Loo, E. J., Caputo, V., Nayga Jr., R. M., Seo, H.-S., Zhang, B., & Verbeke, W. (2015). Sustainability labels on coffee: Consumer preferences, willingness-to-pay and visual attention to attributes. *Ecological Economics*, 118, 215–225.
- Vila-López, N., Küster-Boluda, I., & Sarabia-Sánchez, F. (2017). Designing a packaging to promote healthy and low-fat foods: Adolescents versus young-adults. *Food Research International*, 99, 815–820.
- Visschers, V. H., Hess, R., & Siegrist, M. (2010). Health motivation and product design determine consumers' visual attention to nutrition information on food products. *Public Health Nutrition*, 13(7), 1099–1106.
- Wang, S. S., Brownell, K. D., & Wadden, T. A. (2004). The influence of the stigma of obesity on overweight individuals. *International Journal of Obesity*, 28(10), 1333–1337.
- Wästlund, E., Otterbring, T., Gustafsson, A., & Shams, P. (2015). Heuristics and resource depletion: eye-tracking customers' in situ gaze behavior in the field. *Journal of Business Research*, 68(1), 95–101.
- Wästlund, E., Shams, P., & Otterbring, T. (2018). Unsold is unseen . . . or is it? Examining the role of peripheral vision in the consumer choice process using eye-tracking methodology. *Appetite*, 120, 49–56.
- Zwaan, R. A., Etz, A., Lucas, R. E., & Donnellan, M. B. (2017). Making replication mainstream. *Behavioral & Brain Sciences*, 41, e120.
- Xu, J., Shen, H., & Wyer Jr., R. S. (2012). Does the distance between us matter? Influences of physical proximity to others on consumer choice. *Journal of Consumer Psychology*, 22(3), 418–423.

**The first author wrote the initial draft of the manuscript and conducted the statistical analyses. The second and third author contributed substantially to the conceptualization of the article and made significant contributions with respect to subsequent drafts. The fourth author collected the data.**