



Research report

Eating by example. Effects of environmental cues on dietary decisions



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ABSTRACT

Objective: The present studies examined the role of environmental cues in steering people's dietary decisions in response to food temptations. Based on the notion that people show a tendency to conform to eating standards derived from the eating behavior of others, it was hypothesized that communication of other people's dietary decisions through environmental cues affect whether and what people eat. **Methods:** Conformity to environmental cues about food intake was assessed in a local bakery (Study 1, $N = 144$) and a lab setting (Study 2, $N = 65$). Participants were unobtrusively presented with a bowl of individually wrapped chocolates. The presence of empty wrappers was manipulated, to indicate whether others who had been in the same situation had or had not eaten. Conformity to environmental cues about food choice was assessed in Study 3 ($N = 90$). Participants were required to choose between a healthy and an unhealthy snack. Food wrappers indicated whether previous participants had chosen the healthy or the unhealthy snack. **Results:** As expected, participants were more likely to take chocolates in the presence of an environmental cue that others did too. Also, participants were more likely to choose a snack that was consistent with the choice of others. **Conclusions:** Together, these findings support our main hypothesis that environmental cues steer people's decisions concerning food intake and food choice. Moreover, the results suggest that only small changes in the environment may support healthy eating behavior.

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Introduction

It is increasingly acknowledged that the social context of eating is pivotal for understanding people's eating behavior (e.g., De Ridder, De Vet, Stok, Adriaanse, & De Wit, in press; Delormier, Frohlich, & Potvin, 2009). Accordingly, abundant research has demonstrated the pervasiveness of social influences in steering individual eating patterns. A well known phenomenon is *social modeling*, where people tend to adjust their intake towards the amount modeled by their eating companion (Herman, Roth, & Polivy, 2003). Such modeling effects have also been found when participants were merely exposed to a fictitious list showing how much 'other participants' ate (e.g., Feeny, Polivy, Pliner, & Sullivan, 2011; Pliner & Mann, 2004). In addition, a recent study showed that people do not only conform to the food intake of others, but also to the food choices of other people who are not physically present (Salmon et al., 2012). In combination, these studies show that people take other people's action as a guideline for their own behavior, a phenomenon that has been labeled as a *descriptive norm* (Cialdini, Reno, & Kallgren, 1990).

In the current paper, we look at another way in which people derive eating standards from the actions of others. That is, we look at what an environment signals in terms of norms regarding eating. In a series of three studies, we build on research by Burger et al. (2010) who showed that normative information about food choice can be communicated through cues in the environment. Specifically, we focus on *environmental cues*, by which we refer to *physical cues in the direct environment that convey information about how other people may have behaved earlier on*. These environmental cues signal the prevailing norm with respect to food intake or food choice, as norms can develop out of mere observation of how other people behaved, as witnessed by traces that are left in the environment (e.g., Cialdini et al., 1990; Rutte, Wilke, & Messick, 1987). To illustrate, in a supermarket, a near empty shelf with only two bars of chocolate left shows that many people bought chocolate. Similarly, at a party or reception, empty plates filled with disposed cocktail sticks shows that other guests enjoyed the appetizers. Thus, from an *environmental* perspective, people leave physical traces of where, when and what they ate.

Environmental cues for eating behavior

Despite the importance of understanding the variety of ways in which social influences may affect people's eating behavior, only

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little is known about the effects of normative information regarding eating that is naturally communicated through the environment. Examining such physical traces of other's eating behavior seems especially relevant in light of the current 'obesogenic' food environment, which is characterized by a multitude of unhealthy and easily accessible food temptations (e.g., Wadden, Brownell, & Foster, 2002). That is, people are not only exposed to alluring food temptations, but to environmental cues indicating that others indulged in these temptations as well.

Such environmental cues may influence behavior because they act as a social proof heuristic, meaning that people look at what others do for behavioral guidance when they are unsure, in unfamiliar or ambiguous situations (Cialdini, 2001). Importantly, heuristics function like quick and simple decision rules, thereby steering behavior without people being aware of their influence (Cialdini, 2007). Whereas food temptations are relatively easy to recognize, the influence of environmental cues about how others behaved on previous occasions may be more subtle and unrecognized by the individual. Hence, it is important to examine these cues in the environment that may steer people's eating behavior.

To our knowledge, in the domain of eating behavior, only one empirical paper has addressed environmental cues as we define them (Burger et al., 2010). In two studies it was found that the snack choice of female students was guided by descriptive norm information inferred from empty food wrappers. In both studies, these students had to choose between a healthy and an unhealthy snack bar (Study 1) or select three bite-size snacks from a bowl filled with healthy and unhealthy snacks (Study 2). The norm information was made salient by asking the participant to throw an empty wrapper, presumably left by the previous participant, away in a trashcan, where subsequently three identical wrappers caught the participant's eye. These wrappers indicated that previous participants had typically chosen the healthy or the unhealthy snack. It was found that participants were more likely to choose a snack that was consistent with the norm indicated by the empty wrappers (Study 1) or participants selected a higher percentage of snacks consistent with what they believed were the snack choices of previous participants (Study 2).

This pair of studies provides a first indication of the effect of environmental cues on food choice. Nonetheless, to substantiate the important role of environmental cues in steering people's dietary decisions in response to food temptations, the studies evidently require replication and refinement. Therefore, the present series of studies aims to more broadly cover the extent to which environmental cues operate. First, a healthy diet constitutes making healthy food choices as well as passing on the many opportunities to indulge in unhealthy foods. Therefore, it was deemed important to assess both healthy and unhealthy food choices. Second, to assess the robustness of these effects, it seems relevant to examine how eating standards set by environmental cues stand in relation to standards based on currently activated personal goals regarding healthy eating (considering that goals provide standards; Locke & Latham, 1990). Through contextual priming of these personal goals, which provide standards that are either similar or opposite of the standard provided by the environmental cue, the effect of the environmental cue may be enhanced or inhibited respectively (Bargh & Chartrand, 1999). Thus, an important question to address in the present paper is whether a salient personal eating goal limits people's susceptibility to environmental cues.

The present research

The present studies were designed to further examine the effects of environmental cues on people's dietary decisions, thereby replicating and extending the work by Burger et al. (2010). To that

purpose, information about how others behaved was similarly manipulated by using empty food wrappers. Study 1 was conducted in a field setting where we examined the effect of environmental cues on the choice of taking chocolates. It was hypothesized that more chocolates are taken in the presence of an environmental cue that others took chocolates on previous occasions. In Study 2, we employed a similar procedure in a controlled lab setting, allowing for a more detailed observation and the assessment of other variables that may affect food choice. In Study 3, we assessed the choice between healthy and unhealthy snacks. We hypothesized that people are more likely to choose the snack for which the environmental cue indicates that others chose that specific snack as well. Importantly, we specifically looked at how environmental cues stand in relation to concurrently activated personal eating goals. Therefore, in addition to the food wrapper manipulation, a goal prime procedure was used to make the goal to eat healthily or the goal to eat hedonically (and not necessarily healthy) salient.

Study 1

Participants and procedure

A total of 144 customers of a lunchroom in a local bakery participated in this study. This number was determined by counting the number of ordered drinks in the cash register. On two consecutive Saturdays, a large transparent bowl with two-hundred individually wrapped chocolates was placed in the lunchroom of the bakery located in the back of the store where customers order drinks and food from a menu. The bowl with chocolates was placed on a countertop which customers pass by when they enter the lunchroom from the bakery. The study employed an independent groups 1-factor design, with the number of chocolates taken from the bowl as the outcome variable. The presence or absence of empty wrappers was manipulated between conditions. In one of two conditions, a bowl filled with twenty wrappers was placed besides the bowl with chocolates, whereas this bowl was empty in the other condition.

The conditions were counterbalanced according to time of day, meaning that a little bowl with wrappers was placed next to the bowl with chocolates on the morning of the first day and during the afternoon of the second day. Consequently, customers were automatically assigned to either one of the two conditions. At the end of each day, the number of chocolates left in the bowl was counted. The employees who were instructed to regularly check the experimental setup confirmed that the setup remained unchanged during the experiment.

Results

A total of 65 customers visited the lunchroom when the wrappers were present, during which 19 chocolates were taken, and 79 customers visited when there were no wrappers present, when 11 chocolates were taken. This results in a relative risk of 2.10. When wrappers were present instead of absent, it was 2.10 times more likely, with 95% CI [1.08, 4.09], that chocolates were taken.

Discussion

As expected, the number of chocolates taken was higher when the environmental cue indicated that previous customers had eaten chocolates. A limitation of the present study is that customers were not observed individually, thereby only allowing conclusions on a population level. Also, due to the naturalistic setting, it was unclear whether all customers did notice the bowl with chocolates.

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