



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.

Especially since a large majority of customers did not take any chocolates in the presence of wrappers, which might imply that although our manipulation seemed to have an effect, the effect was not strong.

Considering these limitations, the second study aimed to replicate and extend these findings in the lab. We also aimed to verify that the difference in intake between conditions was not affected by gender (Rozin, Levine, & Stoess, 1991) or individual differences in weight status (Rodgers, Stritzke, Bui, Franko, & Chabrol, 2011), weight concerns (Fedoroff, Polivy, & Herman, 1997), or time of last food intake before the experiment (Shin, Zheng, & Berthoud, 2009).

Study 2

Method

Participants

A total of 66 students participated in the study in return for €2,- or course credit. One participant was removed for inferring the goal of the study in the debriefing, creating a final sample of 65 participants, consisting of 22 male and 43 female students with a mean age of 21.58 years ($SD = 3.08$) and a mean BMI of 22.00 ($SD = 3.23$).

Design and procedure

Participants were unobtrusively presented with a bowl of twenty individually wrapped chocolates. The presence and absence of empty wrappers was manipulated between conditions by placing a bowl filled with ten wrappers or an empty bowl next to the bowl with chocolates respectively.

Each participant was tested individually. Upon arrival in the lab, the experimenter told the participant the following: 'In a little while, you will start with a reaction task. However, to make sure that all participants are equally fit and relaxed, you are first asked to relax for 10 min. You can sit at this table, and there are some magazines if you would like to read during this time. I will return in ten minutes to start the computer task for you.' So, for ten minutes, the participant is left alone at a table on which some magazines and a bowl of chocolates were placed. Note that the experimenter does not inform the participant about the chocolates.

When the experimenter returned, the participant started with an unrelated reaction task. Then, the participant was asked to fill in a brief questionnaire, in which demographics (i.e., age, gender, BMI), the amount of time that had passed since one had eaten anything, and weight concerns were assessed.

The questionnaire was followed by a funneled debriefing procedure, to assess whether the participant had any ideas about the true nature of the study. Finally, the participant was thanked and handed over the money or course credit.

Measures

Demographics. The questionnaire included questions about age, gender, and BMI.

Time since last food intake. Participants were asked 'How much time has passed between the time you last ate something and the time that you began your participation in this study?', which they had to report in minutes.

Weight concerns. Participants' weight concerns were assessed with four items. A sample item is 'I watch my weight', and scores ranged from 1 (*totally disagree*) to 7 (*totally agree*). For the weight concerns scale, Cronbach's alpha was .84 and a mean score was computed.¹

¹ Due to an error in the data collection, half of the questionnaires included scores ranging from 1 (*totally disagree*) to 10 (*totally agree*) for the weight concerns scale. Therefore, these responses on a 10-point scale were standardized and then combined with the standardized scores of the responses on the original 7-point scale.

Results

Randomization check

An ANOVA with condition as the independent variable and age, BMI, time since last food intake, and weight concerns as dependent variables showed that there were no significant differences between conditions on these variables (all p 's > .14). Also, the male to female participant ratio did not differ between conditions, $\chi^2(1) = .92$, $p = .34$.

Effect of environmental cues on food intake

Control variables. Point biserial correlation coefficients were computed to assess potential relationships between eating of chocolates (yes/no) and BMI, time since last food intake and weight concerns. A phi coefficient was computed to assess the potential relationship between eating of chocolates (yes/no) and gender. None of these variables were significantly associated with whether participants took chocolates (all p 's > .18).

Environmental cue. When wrappers were present, 72% of the participants (23 out of 32) took one or more chocolates, whereas 45% (15 out of 33) did so when the wrappers were absent. A chi-square test showed a significant association between the presence/absence of wrappers and whether participants ate chocolates, $\chi^2(1) = 4.67$, $p = .031$. Based on the odds ratio, when wrappers were present as opposed to absent, it was 3.07 times more likely, with 95% CI [1.09, 8.60], that participants would take one or more chocolates.

Discussion

The findings of Study 1 were replicated in this lab study. The results indicate that it was more likely that participants took chocolates in the presence of an environmental cue that previous participants did too. Importantly, only one participant mentioned the wrappers in the debriefing, suggesting that participants were not aware of the wrappers influencing their behavior. Moreover, the results suggest that this effect could not be ascribed to the time passed since participants' last food intake or participants' weight concerns, neither did male and female participants differ in their responses.

In the third study, we aimed to extend these findings by demonstrating that *what* people eat, in terms of healthy or unhealthy, is also affected by environmental cues. In addition, we examined the potential interaction effect between environmental cues and eating goal primes.

Study 3

Method

Participants

In total of 106 students participated in the study in return for €5,- or course credit. From this sample 16 participants chose both the healthy and unhealthy snack options, but with the present sample size the power was too low for a multinomial regression analysis testing for interaction effects. Therefore, these participants were excluded from the data analysis,² creating a final sample of 90

² Removing these 16 participants did not affect the outcomes of the data analysis. A multinomial regression with all three outcome possibilities included (healthy vs. unhealthy vs. both snacks) showed a similar outcome pattern. Further, participants who took both snacks were equally spread across conditions, $\chi^2(3) = 3.81$, $p = .28$. They did not differ from participants who took one snack with respect to age, $F(1,98) = 1.42$, $p = .24$; weight status, $F(1,98) = .01$, $p = .92$; and male to female ratio, $\chi^2(1) = .81$, $p = .51$. Participants who took both snacks did report a longer time since their last consumption (in minutes; $M = 173.00$, $SD = 178.95$), than participants who took one snack ($M = 101.00$, $SD = 86.99$), $F(1,98) = 6.16$, $p = .02$.

participants. This final sample consisted of 35 male and 55 female students with a mean age of 21.87 years ($SD = 3.11$) and a mean BMI of 21.69 ($SD = 2.33$).

Design and procedure

The present study employed a 2 (environmental cue: healthy vs. unhealthy snack) \times 2 (goal prime: healthy vs. hedonic eating) factorial between subjects design, with snack choice (healthy vs. unhealthy) as the dependent variable. Participants were randomly assigned to one of the four experimental conditions upon arrival in the lab. Next, each participant was seated in a cubicle, where written instructions, two magazines (the healthy or hedonic eating goal prime), a plate with six snacks (three of each snack type) and a little bin with three wrappers of either the healthy or unhealthy snack were provided. In the instructions, the following was explained (cover-story): 'This study aims to explore the relationship between different phases of blood glucose regulation and cognitive abilities. After every consumption, your body directly starts regulating your blood glucose. Since physical exertion influences this process of glucose regulation, you first need to relax for ten minutes. You can read some magazines during this time. Also, before you are some snacks. We ask you to eat at least something, but you can decide for yourself how much you want to eat. This consumption brings your body's glucose regulation in the first phase.'

After 10 min, participants were given an unrelated cognitive task, after which the final questionnaire was provided, in which demographics (age, gender, BMI), time since last food intake, and participants' healthy eating goal were assessed. In addition, it was assessed whether the participant had any ideas about the true nature of the study. Finally, the participant was thanked and handed over the money or course credit.

Manipulations

Snack choice. 'LU oat biscuits[®]' served as the healthy option, and 'LU chocoprince[®]' served as the unhealthy option. This pair of snacks was pilot tested among a student sample ($N = 24$), consisting of 12 male and 12 female students with a mean age of 21.91 years ($SD = 2.17$). These participants were asked to rate each snack on how healthy they thought it was (with scores ranging from 1 *very unhealthy* to 7 *very healthy*) as well as how tasty they found each snack (with scores ranging from 1 *not tasty at all* to 7 *very tasty*). It was confirmed that the LU chocoprince[®] was perceived as being less healthy ($M = 2.17$, $SD = .94$) than the LU oat biscuits[®] ($M = 4.30$, $SD = 1.33$), $t(22) = -7.34$, $p < .001$. In addition, both the LU chocoprince[®] ($M = 5.04$, $SD = 1.55$) as well as LU oat biscuits[®] ($M = 4.57$, $SD = 1.31$) were rated high in tastiness, $t(22) = .98$, $p = .34$. Hence, the snacks differed in perceived healthiness, not in hedonic value.

Environmental cue manipulation. Empty snack wrappers showed what kind of snack previous participants (supposedly) had chosen (adopted from Burger et al., 2010). This was manipulated by placing a little bin with either wrappers of the healthy or unhealthy snacks next to a platter filled with both healthy and unhealthy snacks.

Healthy and hedonic eating goal prime. The *hedonic goal prime* consisted of two culinary magazines (adopted from Fishbach, Friedman, & Kruglanski, 2003; Study 5). These culinary magazines were expected to prime the goal of enjoying tasty foods, regardless of how healthy they are. The *health goal prime* consisted of two magazines concerning healthy living, including items on diet and exercise, as well as healthy nutrition and beauty. These latter magazines were expected to make desirable standards like being healthy, fit and physically attractive salient, thereby priming the goal to eat more healthily.

Measures

Demographics and time since last food intake. See Study 2.

Healthy eating goal. Participants' healthy eating goal were assessed with four items (adopted from Kroese, Evers, & De Ridder, 2009; $\alpha = .84$). These items addressed the intention to eat more healthily. A sample item is 'I intend to eat more healthily', and scores ranged from 1 (*totally disagree*) to 10 (*totally agree*). For this scale, a mean score was computed.

Results

Randomization check

An ANOVA with condition as the independent variable and age, BMI, and time since last food intake as dependent variables showed that there were no significant differences between conditions on these variables (all p 's $> .24$). Also, the male to female participant ratio did not differ between conditions, $\chi^2(3) = .71$, $p = .87$.

Healthy eating goal prime

A 2 \times 2 ANOVA was performed with goal prime and environmental cue as the independent variables and healthy eating goal as the dependent variable. There was a main effect of the goal prime: Participants who received the health goal prime had higher intentions to eat more healthily ($M = 4.66$, $SD = 1.41$) than participants who received the hedonic goal prime ($M = 4.05$, $SD = 1.36$), $F(1,89) = 4.29$, $p = .041$.

Effect of environmental cue on food choice

Control variables. Point biserial correlation coefficients were computed to assess potential associations between snack choice (healthy vs. unhealthy) and BMI and time since last food intake. A phi coefficient was computed to assess the potential association between snack choice and gender. None of these variables were significantly associated with snack choice (all p 's $> .20$).

Main effect and interaction. To statistically test for the main effect of environmental cue and a possible interaction between the environmental cue and goal prime in affecting snack choice, a hierarchical logistic regression analysis was performed with snack choice (healthy vs. unhealthy) as the outcome variable. The predictors environmental cue (healthy vs. unhealthy) and goal prime (healthy vs. hedonic) were first added as predictors in Step 1. Next, the interaction term was added to the model in Step 2. In step 1 the environmental cue significantly predicted snack choice (OR = 2.64, CI OR = 1.09–6.43, $p = .032$), whereas goal prime did not significantly predict snack choice (OR = 1.70, CI OR 0.70–4.11, $p = .24$). In step 2, the interaction between environmental cue and goal prime was not significant (OR = 0.36, CI = .06–2.18, $p = .26$) indicating that the effect of environmental cue on snack choice was not dependent upon the goal prime. When empty wrappers of the healthy snack were present, 49% of the participants (22 out of 45) chose the healthy snack, whereas only 27% (12 out of 45) did so when empty wrappers of the unhealthy snacks were present. Logically, when empty wrappers of unhealthy snacks were present, 73% (33 out of 45) of the participants opted for the unhealthy snack, and 51% (23 out of 45) did so when empty wrappers of the healthy snack were presented.

Discussion

As in Studies 1 and 2, the environmental cue was predictive of participants' eating behavior. When participants had the choice between a healthy and an unhealthy snack, they tended to choose the snack that previous participants had chosen. Also, none of the participants mentioned the wrappers in the debriefing. Furthermore,

the results show that the effect of environmental cues on snack choice was not moderated by temporarily salient personal eating goals.

General discussion

In three studies, we examined to what extent people tend to follow the eating behaviors of others on the basis of environmental cues that were indicative of whether others had eaten (Study 1 and 2) and what others had eaten (Study 3). In combination, Study 1 and 2 together provide support for our hypothesis that people respond to environmental cues in deciding whether or not to eat. Study 3 extended the findings from Studies 1 and 2, by showing that participants also tend to conform to environmental cues about the food choice of others, thereby replicating the effects found by Burger et al. (2010). The findings support our hypothesis that people are more likely to choose the snack for which the environmental cue indicates that others chose that specific snack as well. Moreover, conformity to such cues was observed even when an opposite eating goal had been primed.

Theoretical and practical implications

With this series of studies, we extended the literature on social modeling of eating behavior (e.g., Herman et al., 2003) by demonstrating that people are also responsive to hints about others' eating behavior that are naturally embedded within an environment. Moreover, the present findings go beyond previous research on food choice conformity (Burger et al., 2010). The present results show that environmental cues affect both healthy and unhealthy food choices, and that conformity effects are not limited to a female population. Altogether, we shed more light on the extent in which social norms inferred from the environment operate in directing people's eating behavior without people being aware of their influence, an area of research that to date has received only little attention (cf. Vartanian, Herman, & Wansink, 2008).

The studies presented here seem to fit within the current trend to stimulate healthy behaviors with the use of 'nudges' (Thaler & Sunstein, 2008). The term 'nudge' describes "any aspect of the choice architecture that alters people's behavior in a predictable way without forbidding any options or significantly changing their economic incentives" (p. 6). Accordingly, we showed that small changes in the environment can support healthy food choices. Hence, installing 'social nudges', that rely on the pervasive power of social influence, may be a promising avenue for applied research concerned with promoting health behaviors.

Limitations and directions for future research

A limitation is that we did not systematically observe each customer in Study 1. This allows only conclusions on a population level, while it is important to also establish that people are more likely to take chocolates when there are wrappers present as opposed to absent, as was found in Study 2. A replication of this field study is therefore recommended. Another important issue is that we did not examine eating behavior in the absence of any information about others' eating behavior, meaning that there were no control conditions. It thus remains unclear whether the effects of the environmental cues also significantly differed from the effects instigated by the mere exposure to food temptations. Burger et al. (2010) included a control group and found mixed results. Hence, although we showed that there is a substantial difference between both ends of the spectrum, further research is recommended to qualify their relative contributions.

In addition to research dealing with the issues presented above, there are other interesting and important avenues to consider for future research. First, in the present studies, participants were exposed to either a lot of wrappers or no wrappers at all. It remains to be seen how people respond to varying numbers of wrappers. A condition with only a few wrappers could be added to the research design to assess differential effects of people seeing only a few versus a lot of wrappers. Then, an interesting question is also whether people adjust how much they eat to the amount of wrappers, which may result in people eating more in response to a lot of wrappers, and less in response to only a few wrappers. Secondly, further research is warranted to empirically verify what exactly underlies the eating conformity effects instigated by environmental cues. A complete understanding of eating behavior obviously involves knowing *why* people respond to environmental cues. We suggested that environmental cues function like a social proof heuristic, but additional research is needed to substantiate this proposition.

References

- Bargh, J. A., & Chartrand, T. L. (1999). The unbearable automaticity of being. *American Psychologist*, *54*, 462–479.
- Burger, J. M., Bell, H., Harvey, K., Johnson, J., Stewart, C., Dorian, K., & Swedroe, M. (2010). Nutritious or delicious? The effect of descriptive norm information on food choice. *Journal of Social and Clinical Psychology*, *29*, 228–242.
- Cialdini, R. B. (2001). *Influence. Science and practice* (4th ed.). Boston: Allyn & Bacon.
- Cialdini, R. B. (2007). Descriptive social norms as underappreciated sources of social control. *Psychometrika*, *72*, 263–268.
- Cialdini, R. B., Reno, R. R., & Kallgren, C. A. (1990). A focus theory of normative conduct. Recycling the concept of norms to reduce littering in public places. *Journal of Personality and Social Psychology*, *58*, 1015–1026.
- De Ridder, D. T. D., De Vet, E., Stok, F. M., Adriaanse, M. A., & De Wit, J. B. F. (in press). Obesity, overconsumption, and self-regulation failure: The unsung role of eating appropriateness standards. *Health Psychology Review*.
- Delormier, T., Frohlich, K., & Potvin, L. (2009). Food and eating as social practice. Understanding eating patterns as social phenomena and implications for public health. *Sociology of Health and Illness*, *31*, 215–228.
- Fedoroff, I. C., Polivy, J., & Herman, C. P. (1997). The effect of pre-exposure to food cues on the eating behavior of restrained and unrestrained eaters. *Appetite*, *28*, 33–47.
- Feeny, J. R., Polivy, J., Pliner, P., & Sullivan, M. D. (2011). Comparing live and remote models in eating conformity research. *Eating Behaviors*, *12*, 75–77.
- Fishbach, A., Friedman, R. S., & Kruglanski, A. W. (2003). Leading us not unto temptation. Momentary allurements elicit overriding goal activation. *Journal of Personality and Social Psychology*, *84*, 296–309.
- Herman, C. P., Roth, D. A., & Polivy, J. (2003). Effects of the presence of others on eating. A normative interpretation. *Psychological Bulletin*, *129*, 873–886.
- Kroese, F. M., Evers, C., & De Ridder, D. T. D. (2009). How chocolate keeps you slim. The effect of food temptations weight watching goal importance, intentions, and eating behavior. *Appetite*, *53*, 430–433.
- Locke, E. A., & Latham, G. P. (1990). *A theory of goal setting and task performance*. New Jersey: Prentice-Hall.
- Pliner, P., & Mann, N. (2004). Influence of social norms and palatability on amount consumed and food choice. *Appetite*, *42*, 227–237.
- Rodgers, R. F., Stritzke, W. G. K., Bui, E., Franko, D. L., & Chabrol, H. (2011). Evaluation of the French version of the orientation towards chocolate questionnaire. Chocolate-related guilt and ambivalence are associated with overweight and disordered eating. *Eating Behaviors*, *12*, 254–260.
- Rozin, P., Levine, E., & Stoess, C. (1991). Chocolate craving and liking. *Appetite*, *17*, 199–212.
- Rutte, C. G., Wilke, H. A. M., & Messick, D. M. (1987). Scarcity or abundance caused by people or the environment as determinants of behavior in the resource dilemma. *Journal of Experimental Social Psychology*, *23*, 208–216.
- Salmon, S., Fennis, B., De Ridder, D. T. D., Adriaanse, M. A., & De Vet, E. (in preparation). Health on impulse. The healthy influence of heuristics under low self-control conditions.
- Shin, A. C., Zheng, H., & Berthoud, H. R. (2009). An expanded view of energy homeostasis. Neural integration of metabolic, cognitive, and emotional drives to eat. *Physiology & Behavior*, *97*, 572–580.
- Thaler, R., & Sunstein, C. (2008). *Nudge. Improving decisions about health, wealth, and happiness*. New Haven: Yale University Press.
- Vartanian, L. R., Herman, C. P., & Wansink, B. (2008). Are we aware of the external factors that influence our food intake? *Health Psychology*, *27*, 533–538.
- Wadden, T. A., Brownell, K. D., & Foster, G. D. (2002). Obesity. Responding to the global epidemic. *Journal of Consulting and Clinical Psychology*, *70*, 510–525.