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Obesity, overconsumption and self-regulation failure: the unsung role of eating appropriateness standards

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Obesity, overconsumption and self-regulation failure: the unsung role of eating appropriateness standards

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There is a tendency to blame the so-called ‘obesogenic’ environment, characterised by the abundant presence of high caloric, palatable foods, for the failure of self-regulation of eating behaviour and, consequently, the obesity epidemic. In the present article, it is argued that in addition to the omnipresence of food, self-regulation of eating is also compromised by a lack of clear, shared standards that guide eating behaviour. We posit that this social aspect of the toxic food environment is often overlooked and that, without considering the importance of such social eating appropriateness standards as self-regulatory guides, any understanding of successful regulation of eating behaviour will remain incomplete. We hypothesise that the availability of clear, shared eating appropriateness standards will decrease the uncertainty resulting from the current lack of such standards, and will provide effective guidance of eating behaviour, thus calling for a new generation of empirical research examining this novel approach to core components of the obesogenic environment.

Keywords: self-regulation; social norms; obesogenic environment; eating; overweight

Our modern ‘obesogenic’ food environment, with its wide variety of palatable and inexpensive foods that are available at any place and any time of the day, puts a high burden on the self-regulatory capacity of individuals. Compared to our ancestors who were required to jump at any eating opportunity because they were never certain about the next occasion at which food would be available (Pinel, Assanand, & Lehman, 2000), people living in today’s western world are continuously confronted with food and can no longer afford mindlessly eating whatever is within reach (cf. Wansink & Sobal, 2007). Indeed, the abundant presence of foods requires continuous self-regulation of one’s eating behaviour. Self-regulation has been defined as the process by which the self alters or overrides immediate responses to behave in conjunction with personal goals (Baumeister & Vohs, 2007). To engage in effective self-regulation, people need to decide which goals they want to pursue, determine the strategies by which they want to achieve these goals and monitor the degree to which they are making progress towards that goal (Carver & Scheier, 1998). Unfortunately,

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many people experience major difficulties in their attempts to self-regulate food intake and eventually fail to do so successfully – as witnessed by skyrocketing rates of overweight and obesity (World Health Organization, 2005).

There is a tendency to blame the abundant presence of food for self-regulation failure, the argument being that the overwhelming presence of foods is what makes our food environment ‘obesogenic’ (Wadden, Brownell, & Foster, 2002) and self-regulation impossible (Lowe, 2003). Consequently, there is a strong call for the restriction of the availability of energy dense foods to reduce the self-regulatory burden (Horgen & Brownell, 2003; Schwartz & Brownell, 2007). However, is it really the unlimited availability of food alone that makes our modern food environment ‘obesogenic’ and challenges self-regulation? We believe that it is not and argue that, while the abundant presence of food may certainly compromise successful self-regulation of eating behaviour, another quintessential factor is at play here. In this article, we advance the novel hypothesis that, in addition to the omnipresence of food, self-regulation of eating is also (and perhaps even more so) compromised by a lack of clear, shared eating appropriateness standards that guide what to eat, how much to eat, and where and when to eat. We argue, supported by empirical evidence when available, that this lack of eating appropriateness standards is another key element that makes our modern food environment ‘obesogenic’. We also posit that this inherently social aspect of the obesogenic food environment is often overlooked and that, without considering the importance of social standards that guide eating behaviour, any understanding of self-regulation failure in eating behaviour will remain incomplete. In the present article, we provide an analysis of eating appropriateness standards as a highly crucial, but often neglected aspect of the toxic food environment. We argue that clear eating appropriateness standards are necessary to support effective self-regulation. Unambiguous standards can function as efficient guides for behaviour and decrease the extent to which decision moments require active self-regulation. Specifically, we argue that when standards are available to guide people through most food-related decision moments of the day, self-regulation resources may be spared for those situations that require personal decision-making and self-regulatory capacity. In the following we will not provide an exhaustive overview of the literature, but rather aim to make a case that the absence of shared social standards (to the extent that these are lacking or unclear) plays a hitherto unrecognised role in self-regulation failure of eating behaviour. We will illustrate our argument by examining situations in which clear eating appropriateness standards are lacking, showing that the absence of behavioural guidelines compromises people’s attempts to successfully navigate the toxic food environment.

Behavioural standards play a crucial role in self-regulation because they represent the goals that people strive for and the desired endpoints they use to assess progress in achieving their goals (Carver & Scheier, 1998; Hagger, 2010; Hall & Fong, 2007). Psychological theory and research on self-regulation has extensively highlighted the important role of *personal* behavioural standards (as in what people themselves find appropriate) in self-regulation (Carver & Scheier, 1998). A body of recent research, in addition, investigates social and interpersonal influences on self-regulation (for a review see Finkel & Fitzsimons, 2011). An important way in which the social environment can affect self-regulation is through its influence on the goals that people adopt and the related behavioural standards they use to compare their

performance, a process that can be explicit as well as implicit (Locke & Latham, 2002, 2006; Shah, 2005).

The social environment exerts strong influences on people's experiences and behaviour (Fiske, 2010). People seek out and are influenced by what others do, expect and value to establish what is the correct (informational social influence) or appropriate (normative social influence) thing for them to do (Deutsch & Gerard, 1955). The practices and expectations, that is, the behavioural norms, that prevail in a certain social group as large as a community or a country or as small as a family or a peer group hence function as social standards that guide the self-regulation of behaviour, including eating behaviour. Social standards provide directions regarding how to behave in a certain situation, making it obvious how to behave in a particular manner, and we propose, thereby, decreasing the burden of individual decision-making in that situation. This hypothesised facilitation of self-regulation by social standards, through a reduced need for active decision-making, is in line with recent research showing that external control can act as a substitute for active self-control (Fishbach & Trope, 2005). Vice versa, research has also shown that social standards are particularly influential for behaviour when an individual's self-regulatory capacity is momentarily low (Fennis, Janssen, & Vohs, 2009). Together, this research clearly suggests a link between socially and culturally defined behavioural standards and self-regulation (for a review see, for example, Vohs, Lasaleta, & Fennis, 2009).

Applying this general knowledge about the influence of social standards on self-regulation and behaviour to eating, we argue that a crucial determinant of eating behaviour must be the social standards that exist around food consumption. We refer to these standards as eating appropriateness standards; standards that inform us about what is appropriate to eat, and how much, as well as when and where eating is appropriate or not. The term 'eating appropriateness standards' is proposed to cover the broad array of social standards that influence consumption. We view such standards as being shaped socially and culturally and internalised into people's everyday routines. Because of this ingrained nature, we argue that eating appropriateness standards play an important role not only in social eating situations, with other people present, but that they are similarly influential in situations where we eat alone. Evidence for the idea that social standards may influence behaviour also when people are alone stems from, for example, Cialdini's seminal work on towel reuse in hotel rooms (Goldstein, Cialdini, & Griskevicius, 2008): a social standard about towel reuse set by supposedly similar others (hotel guests who had allegedly used the same room previously) influenced people's own towel reuse behaviour at a time when they were alone, because of the ingrained nature of the social proof principle.

Previous research has shown that eating appropriateness standards indeed play an important part in determining eating behaviour. Work on normative eating contexts (e.g., Herman, Fitzgerald, & Polivy, 2003; Herman & Polivy, 2005; Herman, Roth, & Polivy, 2003) demonstrates that if, what, how much, when and where others eat influences individuals' own eating behaviour, because it indicates what is the appropriate or correct eating behaviour. Moreover, work on the so-called consumption norms (e.g., Wansink, 2004; Wansink & Kim, 2005; Wansink, Payne, & Shimizu, 2010) demonstrates that also cues from the environment influence individuals' consumption patterns. This is because these cues provide hints as to what would be the correct way to deal with available foods and people thus infer eating appropriateness standards from these cues.

What this body of research clearly demonstrates is, firstly, that socially defined and learned eating appropriateness standards (constituted by both people in the environment as well as more physical and situational cues in it) are an important factor in eating behaviour. Secondly, these eating appropriateness standards can aid people in making eating-related behavioural decisions and can thereby reduce the burden on individual self-regulation. What we aim to add to this knowledge is a theoretical exploration of why those standards are so important for the self-regulation of eating behaviour in the context of the obesity epidemic. Crucially, we argue that a current *lack of eating appropriateness standards* plays a substantial, but as of yet largely unacknowledged, role in the obesity epidemic. We argue that the role of eating appropriateness standards in the self-regulation of eating behaviour has not received much attention until now, and that the absence of such standards (to the extent that they are lacking or unclear) plays a hitherto unrecognised role in self-regulation failure. Indeed, most self-regulation research has highlighted an intra-individual approach, examining how people select and pursue goals by themselves. In the present article, we make a case for including eating appropriateness standards as a relevant social factor that affects self-regulation of eating behaviour.

As an illustration of our case, consider the following two situations in which social standards are either present or absent. You are out with a group and are really hungry. You all go to a restaurant that is known for its sandwiches, which are delicious, but not especially large; everyone orders a sandwich. You are really hungry and don't think one sandwich will be enough to fill you up, but are reluctant to violate the social norm of one sandwich being the appropriate amount to eat. In this case the social norm is clear but the individual motivation conflicts with the norm. A situation lacking a norm might be the same scenario but where some people are hungry and order more food, while others are less hungry and just order a sandwich with no other dishes (salad, fruit or dessert), or a smaller snack. So there is no norm for how much to eat. Now what do you do (1) if you are really hungry (and there is no clear eating norm as everyone is ordering different amounts of food), or (2) if you are not very hungry but everyone else is eating at least a snack (and you want to maintain your diet or eat healthily but everyone else is eating an unhealthy snack or a wholemeal)?

This anecdote, probably familiar to most readers, shows that a lack of standards about the appropriateness of eating may result in uncertainty about how to behave. In situations in which eating appropriateness standards are unclear or lacking, people have to rely solely on their self-regulation competence when trying to act upon their intention not to eat unhealthy snacks, because there is no clear guidance to decide what to do. Importantly, in the absence of clear standards, even good self-regulators can regulate their behaviour on their own only to a certain extent and for a short period of time, because self-regulation resources are limited (e.g., Hagger, Wood, Stiff, & Chatzisarantis, 2009; Muraven, Tice, & Baumeister, 1998) and people may tend to engage in impulsive behaviour (Gibbons, Wills, Kingsbury, & Gerrard, 2011; Hofmann, Friese, & Wiers, 2011; Veling & Aarts, 2011). Therefore, such individual self-regulation is doomed to fail if one encounters too many situations in which eating appropriateness standards are lacking, even if a person would generally be a 'good self-regulator'.

Overview of the article

The present article aims to demonstrate, firstly, that the high availability and accessibility of food alone cannot account for the toxicity of our modern food environment and, secondly, that a lack of unambiguous eating appropriateness standards regarding eating behaviour constitutes an important, but typically overlooked aspect of our toxic food environment. We first discuss research on the effects of food restriction on food intake, demonstrating that mere restriction of the availability and accessibility of (energy dense) food does not necessarily result in decreased consumption. In fact, we show that the free availability of foods, rather than restriction, may in some cases support self-regulation, and provide a theoretical framework further underscoring this point. We then discuss research on the pivotal role of eating appropriateness standards in guiding eating behaviour. Specifically, we illustrate that the present food environment is characterised not only by abundance, but also by uncertainty caused by inadequate standards, and that this contributes to self-regulation failure and overconsumption. Lastly, we discuss to what extent future interventions should focus on reinstating clear, unambiguous eating appropriateness standards rather than on limiting access to unhealthy foods, while simultaneously enhancing self-regulation capacity to provide people with the tools to deal with those situations that remain ambiguous even in the face of (new) standards.

The toxic food environment: is it merely the availability and accessibility of food?

Our modern society is characterised by a ubiquity of large quantities of food. Food, especially high-caloric, 'unhealthy' food, can be purchased in copious amounts at any place, any time of day, as illustrated by the high density of fast-food outlets and the availability of supersize meals in restaurants (e.g., Feng, Glass, Curriero, Stewart, & Schwartz, 2010; Ford & Dzewaltowski, 2008; Morland & Evenson, 2009; Nielsen & Popkin, 2003; Wansink & Payne, 2009; Young & Nestle, 2002, 2007). Attempts to define the core characteristics of the toxic food environment vary (Horgen & Brownell, 2003; Swinburn, Egger, & Raza, 1999), but in general features of availability and accessibility (e.g., increased salience of food, a wide variety of food assortments, large size of food portions, packages and dinnerware, stockpiling) are blamed for what people eat and how much they eat (Wansink, 2004, 2010). The changing food environment coincided with an alarming increase in overweight and obesity prevalence. This makes it plausible that a link exists between the food environment, food intake and overweight prevalence. What is less clear, however, is how precisely features of the food environment impact on the self-regulation of eating behaviour. If features of availability and accessibility directly impact upon what we eat, then by logical deduction, changes in the availability and accessibility should also directly affect the consumption of foods. Evidence for such a causal mechanism is at best mixed, however. We will present some compelling illustrations of the mixed evidence surrounding the role of the obesogenic environment in the following.

Large portion sizes have been blamed as one of the most important contributors to overweight (e.g., Rolls, Morris, & Roe, 2002; Wansink, 2004). A typical response to get a grip on the obesity epidemic is to limit access to excess and make unhealthy foods less available by reducing the size of portions. Presenting people with smaller

portions has been shown to decrease the purchase and intake of meals and snacks in some studies (Freedman & Brochado, 2010; Hartstein et al., 2008; Rolls, Roe, & Meengs, 2006a, 2006b), but proved ineffective in others (Ebbeling et al., 2007; Rolls, Roe, Halverson, & Meengs, 2007). Rolls et al. (2007), for example, demonstrated that when people eat from smaller plates their intake is not affected – they simply made more trips to the buffet to compensate for the small portions. Some studies even demonstrated ironic effects of smaller portion sizes in the sense that people ended up eating more when they were presented with smaller portions or packages of food (Do Vale, Pieters, & Zeelenberg, 2008; Scott, Nowlis, Mandel, & Morales, 2008). There are a number of theoretical explanations for the unexpected ironic effects of reductions in portion sizes on food purchase and food intake. According to Counteractive Control Theory (Myrseth, Fishbach, & Trope, 2009; Trope & Fishbach, 2000), temptations (e.g., the availability of palatable foods) may remind people of their long-term goals rather than make them forget about these goals. This implies that the mere availability of foods alone is an insufficient account of overconsumption (Fishbach, Friedman, & Kruglanski, 2003). In a similar vein, the Critical Level Model argues that self-regulation is promoted when the threat to the long-term goal is considered sufficiently serious (Gilbert, Lieberman, Morewedge, & Wilson, 2004). Empirical research on eating behaviour indeed showed that to the extent that food items were evaluated as more (rather than less) tempting, young women with a weight concern exerted more self-regulation and made healthier food choices (Kroese, Evers, & De Ridder, 2009, 2011).

Another frequently used tool for intervening in the food environment is to restrict the access to certain foods. Again, however, there is limited evidence of the effectiveness of this strategy. Mann and Ward (2001), for example, showed that when individuals were not allowed to eat from foods they liked, their subsequent eating behaviour did not differ from those who were allowed to consume their preferred food. Studies in the home environment even suggested that the restriction strategy may be ineffective and showed that parental food restriction may promote increased consumption of ‘forbidden’ foods at other times when they are accessible (Birch & Davison, 2001; Faith, Scanlon, Birch, Francis, & Sherry, 2004; Fisher & Birch, 1999a, 2000). Similar results were obtained in student samples who were not allowed to eat from a particular type of food (Coelho, Polivy, & Herman, 2006; Polivy, Coleman, & Herman, 2005). These findings can be explained by assuming that restriction of eating opportunities signals scarcity and thereby reinforces the rewarding value of food (Epstein, Leddy, Temple, & Faith, 2007), promoting consumption in situations where food is not scarce. It may also be that restricted access to food elicits ironic responses, as suggested by Wegner and colleagues (Wegner, 1994; Wegner & Erber, 1992), resulting in increased mental accessibility of these ‘forbidden’ foods. Another possible explanation may be that people who are confronted with food restriction may subsequently show a reactance effect (Brehm, 1966), experiencing an increased desire to eat exactly those foods that they are denied access to affirm their personal freedom. This has indeed been demonstrated in various studies (Finkelstein & Fishbach, 2010; Fisher & Birch, 1999a, 1999b, 2000). Bearing in mind that restrictions cannot be complete and everlasting, such a reactance effect could then result in increased consumption of those highly desired foods the moment they become available and accessible again. In fact, a literature review that examined the effects of various parental feeding strategies on child eating

behaviour and weight status indicated that, of all strategies under investigation, only the strategy of feeding restriction was consistently related to higher consumption and higher weight status in children (Birch & Davison, 2001).

A more effective way of addressing food accessibility might be to increase the distance to unhealthy foods. Few experimental studies have been conducted in this area, but all show significant reductions in intake when the distance to (unhealthy) foods is adjusted (Maas, De Ridder, De Vet, & De Wit, *in press*; Musher-Eizenman et al., 2010; Wansink, Painter & Lee, 2006). Another promising intervention may be the adjustment of food prices. Price reductions of healthy foods sold in vending machines and cafeterias in schools and worksites have repeatedly been shown to increase purchase of the target foods (French et al., 1997; French, Jeffery, Story, Hannan, & Snyder, 1997; French et al., 2001; French, Story, Fulkerson, & Hannan, 2004; Horgen & Brownell, 2002). In a similar vein, price increases of unhealthy foods decreased the purchase and intake of these food items (Epstein, Dearing, Paluch, Roemmich, & Cho, 2007; Epstein, Dearing, Roba, & Finkelstein, 2010). Unfortunately, however, such price changes may only have short-term effects as consumption tends to return to its baseline level after price stabilisation (Dellava, Bulik, & Popkin, 2010). Notwithstanding the promising effects of distancing and pricing interventions on food intake, we argue that social standards remain important and may even contribute to an improved effectiveness of availability and accessibility interventions.

Conclusion

The aforementioned studies illustrate that the food environment has dramatically changed over the past decades and this changed environment has had a pervasive influence on our eating patterns. However, exactly how the environment affects efforts to self-regulate food intake is much less understood. In contrast to popular notions, research shows that restricting the availability and accessibility of foods is not a panacea for sustained reductions in food consumption. While it may seem intuitively plausible that limiting opportunities to eat unhealthily should support individuals in regulating their food intake, effects are at best mixed, suggesting that there is more to our toxic food environment than availability and accessibility of food alone. Naturally, if eating opportunities would be limited in all food-related situations, this would provide a very effective and clear-cut way to overcome problems related to overconsumption and obesity. However, such a completely controlled food environment with everlasting limited accessibility and availability is simply not feasible, nor would it be desirable, as it would impose an unacceptable interference with individual decision-making. When availability and accessibility can only be restricted in some but not all situations, studies show that this does not consistently result in better regulated eating behaviour. In fact, there are reasons to suspect that banning unhealthy foods on some occasions may actually hinder rather than assist self-regulation of food intake (see Faith et al., 2007 for an overview). Together this suggests that when investigating the role of the environment on consumption, we need to look beyond the abundant presence of food alone. Besides unrestricted access to foods, our present food environment is also characterised by unclarity about what is appropriate or normal when deciding about what and how much to eat, and where and when to eat. In other words, clear standards that would help to regulate one's eating behaviour are largely lacking. In the next section, we

argue that this lack of clear standards constitutes a second toxic factor of our current food environment. Specifically, we will illustrate that old standards may no longer be valid in the present food environment that has changed much more rapidly than the standards themselves. At the same time, we are still relying on those old standards as if the situation had not changed. As once useful standards are now insufficient, and new, more appropriate standards are not available, we are in effect confronted with a lack of standards.

The toxic food environment: a case of insufficient standards?

We have defined eating appropriateness standards as shared practices and expectations regarding what is the appropriate or normal course of action in a specific eating situation. To illustrate, an eating appropriateness standard may involve that one does not consume large amounts of snacks just before a meal is served or that one does not take the last available serving without asking permission of one's eating companions. Standards are diverse internalised eating rules or guidelines that help direct behaviour almost self-evidently and perhaps even implicitly, as well-ingrained heuristics or scripts, thereby reducing the demand for individual's active self-regulation (Shah & Oppenheimer, 2008). Previous research has demonstrated that aspects of the social environment may have profound effects on eating behaviour in terms of how hungry we feel (Herman, Fitzgerald, et al., 2003) and how much we consume (Herman & Polivy, 2005; Herman, Roth, et al., 2003; Roth, Herman, Polivy, & Pliner, 2001). Socially defined eating standards have even been identified as 'the most important and all-pervasive influence on eating yet identified' (De Castro, Brewer, Elmore, & Orozco, 1990).

A compelling illustration of the importance of eating appropriateness standards can be derived from the so-called 'French Paradox', the phenomenon that the French are more exposed to all kinds of palatable and apparently unhealthy foods than Americans and yet remain leaner (Rozin, Kabnick, Pete, Fischler, & Shields, 2003). The French eating culture may appear to be very much focused on food enjoyment, but is in fact highly regulated, with strict rules about where, when, what and how much to eat (Rozin, Fischler, Shields, & Masson, 2006). For example, in France, having dinner is a social event in which the whole family comes together to enjoy the food and the company of others. Meals more generally are well-defined moments of the day, embedded in a strong social structure. In the United States, on the other hand, the concept of family dinner has faded and family members may have dinner at varying places and times, and in any (or no) company, indicating a kind of individual, functional event, which is not guided by communal standards or guidelines (Rozin et al., 2006). The large discrepancy between these two food cultures may explain how the French are able to deal with the delicious foods surrounding them much better than Americans, even if the French may have more appetitive food on their plates, and thus why the French stay leaner. Notably, the French can handle these situations better because they can rely on clear guidelines that characterise their food culture. That said, it is obvious that the French food environment also differs from the prototypical obesogenic environment that is observed in the USA, which may pose an alternative explanation for the French Paradox. However, although at a slower pace, the food environment in European countries has also changed dramatically in the past decades, as documented both by

studies on food availability and accessibility and national rates of overweight (e.g., Branca, Nikogosian, & Lobstein, 2007).

When clear guidelines are lacking, because eating appropriateness standards are invalid, ambiguous or absent, people are confronted with uncertainty about how to behave. This makes eating behaviour mostly a matter of individual choice and increases the risk of self-regulation failure, because repeated decision-making has been shown to be depleting or to lead to misregulated efforts (Pocheptsova, Amir, Dhar, & Baumeister, 2009; Vohs et al., 2008; Wang, Novemsky, Dhar, & Baumeister, 2010). In contrast, when self-regulation support is available, self-regulation capacity is saved or even replenished (Shah & Oppenheimer, 2008). In the remainder of this section we examine if and in what way eating behaviour is affected when appropriate eating standards are absent. We will in particular present various examples of standards that are poor guides of eating behaviour. These instances typically occur in one of two types of situations: either the old standards are no longer useful in the altered food environment while new standards have not come into existence, or new food situations have emerged for which clear eating appropriateness standards have yet to be established.

Modern day overconsumption norms are a powerful illustration of the possibility that old eating appropriateness standards have become invalid and that this affects eating behaviours. In contemporary western societies, people will regularly find themselves confronted with norms that outright promote overeating (Wansink, 2004). Take the example of getting a snack when you are at the movies. Ordering a 'small' cup of popcorn will likely mean you receive a cup that more accurately represents a standard serving of popcorn than if you would order the size labelled 'regular'. Similarly, if you would like to buy a soda, you would have a hard time getting your hands on a standard serving because sodas are almost exclusively sold in cans (33 cl, 1.5 servings; which would be considered large by European standards but still quite small by American standards) or small bottles (50 cl, two servings). The new consumption standard simply does not allow a choice anymore between a 'real' small portion and a so-called small (but actually huge) portion.

Other instances of standards that are no longer valid can be found in, for example, the existence of all-you-can-eat buffets stimulating the consumption of as much food as possible, and the availability of supersized quantities of food at any location where food for immediate consumption is sold. While at first sight these situations seem to be merely in accordance with or reflect the typical abundant availability of foods in the modern food environment – and thus may represent 'new' unhealthy overconsumption standards rather than old standards that are no longer valid – there are reasons to believe that these standards are a good example of an outdated norm that compromises eating behaviour. Only a few decades ago, it may have been sensible to eat as much as one could when there was an opportunity to do so, simply because there were not so many opportunities to overeat (Pinel et al., 2000). In the old days then, eating (a little bit) too much was associated with special occasions like going out for dinner, holidays, anniversaries, weddings, or other celebrations. However, relying on the standard to overeat on special occasions is obviously no longer appropriate in the present food environment which, with its ample opportunities to overeat, seems to advocate the standard that people can eat as if they were celebrating every day.

In other cases, old standards have grown outdated because they do not cover all eating opportunities of the modern environment. In the past, eating opportunities were more delimited, both in terms of when and where to eat as well as in terms of what and how much to eat, and the existing food rules corresponded well with these eating opportunities. In the Netherlands, for example, families traditionally had dinner at 6 pm with the whole family. It was therefore clear to everyone that you should not take a snack at 5:30 pm, because you were ruining your appetite (and your mom would be mad). Dutch dinner times now vary much more, as do the types of food consumed at dinner, resulting in increasing unclarity regarding what constitutes a 'normal' dinner. Moreover, while the traditional 6 pm dinner used to be well-defined as being the final eating opportunity of the day, nowadays one is very likely to run into further eating opportunities later on in the evening. For these additional exposure moments, no clear food rules have been established since they did not previously occur.

Another example illustrating that overconsumption may occur in new eating situations, to which old standards may not apply, is the 'Freshman 15' phenomenon, which refers to the observation that on average students tend to gain a considerable amount of weight (up to 15 pounds) in their first year of college (Levitsky, Halbmaier, & Mrdjjenovic, 2004). While the famous 15 pounds are in reality more likely to be only the 'Freshman 5' (Holm-Denoma, Joiner, Vohs, & Heatherton, 2008), college freshmen certainly gain weight at a greater rate than do others within their age group: up to 4.2 pounds over 12 weeks (Levitsky et al., 2004). Surprisingly, until now researchers have not proposed absence of eating appropriateness standards as an explanation for weight gain during the first year of college, even though students find themselves living in a new situation where old standards may no longer apply or that can even be characterised by an absence of standards (e.g., lacking parental guidelines about eating). Indeed, weight gain is typically observed in the very first months after entering college, and specifically in students living at campus away from their parents (Pliner & Saunders, 2008). After this time the weight gain is maintained (Holm-Denoma et al., 2008), but no further weight is gained, giving credence to our interpretation that weight gain is associated with encountering new eating situations to which previous standards do not apply. Also, there is evidence to suggest that dramatic changes in eating habits in terms of types of food (notably junk food; Levitsky et al., 2004) and amount of food (Holm-Denoma et al., 2008) are responsible for weight gain. One might argue that an alternative explanation for the observed weight gain in freshmen is that this may be the result of being exposed to new campus norms advocating overconsumption. However, this seems unlikely as typically after one year no more weight gain is observed, suggesting that it is the confrontation with a lack of standards that confuses students and makes them overeat.

Furthermore, a parallel phenomenon, the high consumption of alcohol on college campuses, has been explained in ways that reflect the importance of a lack of (awareness of) accurate standards. In particular, an influential explanation for excessive alcohol consumption among college students is that this reflects a case of pluralistic ignorance, whereby public behaviours are erroneously taken to reflect private attitudes, and students mistakenly believe that they are more uncomfortable with campus alcohol practises than the average student (Prentice & Miller, 1993;

Suls & Green, 2003). One might argue that pluralistic ignorance represents a case of unclear or ambiguous social standards.

An important example of new eating situations for which no appropriate eating standards have been established yet can be found in the manner in which food is presented. People use a variety of food cues (e.g., portion size, food type) and environmental cues (whether one is seated, the presence of others, location) to determine whether an eating occasion would constitute a meal (which is a 'normal' eating occasion) or a snack (which is a 'special' eating occasion that many people try to avoid; Marshall & Bell, 2003; Wansink et al., 2010). As there is an increasing variability in both the types of food available and the locations where food is consumed, it has become more and more difficult to decide whether an eating opportunity is appropriate (meal) or not (snack) (Wansink et al., 2010; cf. Pliner & Zec, 2007). In the absence of a clear eating appropriateness standard to determine whether a food opportunity is a meal or a snack, many people end up snacking all day, as is also evidenced by snack consumption being regarded as the most important contributor to the overweight epidemic (Piernas & Popkin, 2010; Zizza, Siega-Riz, & Popkin, 2001). Relatedly, dieticians who participated as interventionists in several studies in our lab observed that people who watch their weight may engage in frequent snacking and actually gain weight, because they misinterpret the information that they should eat less, causing them to consume insufficient food during meals. Such over-restriction during the actually appropriate eating opportunities results in subsequent increased craving for snacks between meals.

Another prominent example of 'unguided' situations in our present society is the common experience of being confronted with endless opportunities to eat and a true bombardment of advertisements promoting the consumption of calorie-dense foods, while at the same time being exposed to frequent recommendations to eat more healthily or watch one's weight through health promotion campaigns. Although the effects of exposure to these conflicting standards are not fully understood or documented, it has been reported that people may become confused or worried about food and eating when they are exposed to multiple contradicting food messages (Polivy & Herman, 2002; Rozin, 1998; Rozin, Fischler, Imada, Sarubin, & Wrzesniewski, 1999), creating an increased risk of overeating.

The crucial importance of eating appropriateness standards in adapting to new situations is also exemplified by considering situations in which standards are absent. A typical case in which standards are lacking is when a dieter discontinues her diet. Whereas during the period of dieting she can rely on clear guidelines about what and how much to eat, once the diet is abandoned (typically after about two weeks of dieting; Polivy & Herman, 1999) a new situation arises, characterised by a sudden absence of dietary guidelines which may act as rules to protect from overeating (Herman & Polivy, 2005; Levitsky et al., 2004; Mills & Palandra, 2008). One might argue that the dieting case is an example of restriction norms that should support rather than compromise self-regulation. However, the extreme and sometimes even unrealistic restriction standards dieters typically hold illustrates that dieting standards are not good guides of eating behaviour and sometimes even represent idealised images of skinny models rather than eating standards (Stice, Mazotti, Krebs, & Martin, 1998). The dieting case may also not be representative of how lacking standards compromise self-regulation because dieters may be less skilled self-regulators or respond to having been inhibited too long by overindulging (Herman &

Polivy, 2007). Nevertheless, notwithstanding that during the period of dieting she may have over-relied on the dieting protocol, the moment the dieter breaks her diet she is confronted with an absence of guidelines about what and how much to eat. As such, the dieting example, albeit extreme, may illustrate the mechanism that is also present in less extreme examples of when people have no heuristics to rely on in guiding their eating behaviour. To date there is, however, no empirical evidence to support or refute this line of reasoning, reflecting the importance of testing this alternative interpretation for the frequently observed weight gain after breaking a diet as resulting from being confronted with a situation free of (either dieting or pre-dieting) standards.

Conclusion

In conclusion, our contemporary food environment is not only characterised by the abundant availability and accessibility of palatable foods, but also by invalid, ambiguous or lacking social standards to guide eating, which seems to contribute substantially to overconsumption. Admittedly, it may be difficult to determine exactly whether the examples we discussed constitute cases of either invalid, ambiguous or lacking social standards. Regardless of their precise categorisation, however, these examples illustrate that the absence of clear, socially shared guidelines about how to behave in eating situations compounds self-regulation challenges and increases the likelihood of self-regulation failure. The resulting need for clear and straightforward standards has been illustrated by Pollan (2009), who, in his bestseller *Food Rules*, presents a selection of more than 2500 rules and adages sent to him by the readers of his New York Times blog. Many of these rules are straightforward indeed, such as 'It's not food if it arrived through the window of your car', 'Don't ingest food made in places where everyone is required to wear a surgical cap' or 'Spend as much time enjoying the meal as it took to prepare it'. Notwithstanding the sometimes funny nature of the rules that Michael Pollan's readers provide, the very fact that they took the time to respond to the blog with this kind of recommendations is in itself a clear and serious signal of two things: firstly, that there is a need to disentangle appropriate consumption opportunities from the inappropriate ones, and, secondly, that clear standards are perceived as an important tool through which this can be achieved.

Eating appropriateness standards in support of self-regulation

We hypothesise that the availability of clear eating appropriateness standards would decrease the uncertainty resulting from the current lack of such standards, and would provide effective guidance of eating behaviour. Indeed, as we have argued throughout our article, when clear eating appropriateness standards are in place, this can strongly support effective self-regulation of eating. The presence of another person who does not snack can, for example, aid people in refraining from snacking themselves (see Herman, Roth, et al., 2003, for a review of modelling effects), even when they have not eaten in 24 hours and are thus effectively starved (Goldman, Herman, & Polivy, 1991). More generally, behavioural modelling studies provide strong evidence that, in unfamiliar eating situations, people adjust their food intake to the social norms established by others (Nisbett & Storms, 1974; Polivy, Herman,

Younger, & Erskine, 1979; Roth et al., 2001). Obviously, social standards about what and how much one should eat are not inherently good (or bad, for that matter). The very content of those standards determines to what extent it will guide people in eating more healthily. However, the point that we are aiming to illustrate here is that such social standards about eating appropriateness can support individuals in their self-regulation of eating behaviour.

Having clear eating appropriateness standards in place can thus help people navigate the obesogenic environment more successfully. We argue that this supportive effect of eating appropriateness standards occurs in two ways, giving rise to a new approach of investigating the role of social standards in support of self-regulation. Firstly, standards may function as decision-making heuristics or behavioural scripts that in certain situations guide behaviour without a strong need for active self-regulation. The available standard will signify the appropriate behaviour, thus resulting in less need for decisions by the individual. Secondly, as social standards can never cover all food-related decision moments of the day, (many) situations will still occur where eating appropriateness standards are not sufficient to automatically prompt healthy behaviour. We argue that also in such situations, standards can aid self-regulatory effort, though they will not fully determine behaviour.

Importantly, the argument we make in support of the importance of eating appropriateness standards is not meant to convey that we suggest that such standards should exist to dictate all behaviour, with little or no autonomy for the individual. Quite the contrary, we believe that an environment in which strong supportive standards exist can (and should) at the same time be autonomy supportive (cf. Thaler & Sunstein, 2008). While eating appropriateness standards to guide our behaviour may limit the number of situations in which one has to use self-regulation resources – which, given that people on average encounter 200 food and eating decisions per day according to a recent study by Wansink and Sobal (2007), would be very helpful – standards should not and cannot exist to dictate all behaviour. When standards are available to guide people through most or many food-related decision moments of the day, people need not exert excessive active self-control during these moments, but can rely on the heuristics of the available standards. This, in turn, means that one's self-control capacity need not be depleted (Vohs et al., 2008). Crucially, we argue that when clear eating appropriateness standards are in place for more common, everyday food decision moments (for example, where and when to eat dinner), self-regulatory strength can be saved and self-regulation resources will not be depleted when a 'truly difficult' eating-related decision presents itself. Moreover, when these difficult eating decisions occur that require active self-regulation, having clear social standards in place may again facilitate self-regulation. Notably, it has been shown that when situational norms are well-established (e.g., 'when entering the library one should be silent'), the environment is capable of automatically activating the normative behaviour (Aarts & Dijksterhuis, 2003). Clear standards specifying which behaviour is appropriate thus make self-regulation swift and efficient. Conversely, self-regulation has been shown to become impaired when social situations are ambivalent, as when others act in counter-normative ways (Dalton, Chartrand, & Finkel, 2010), or when social standards are imposed rather than self-selected (DeBono, Shmueli, & Muraven, 2010).

Critical questions that emerge from our analysis of the importance of eating appropriateness standards are what these standards should look like and how they

can be (re)instated. The present article set out to signal the role of a lack of clear eating appropriateness standards in the obesity epidemic, and we have argued that a ready-made solution to remedy this situation is not available. Nevertheless, and although more research is without a doubt needed, we would like to propose several guidelines that could be useful, although these suggestions need be rigorously empirically tested before they can be implemented. First of all, we posit that when trying to instate new standards, it is important to ensure that these standards are not simply imposed by external agents, but actually represent *a shared set of rules that people feel autonomously motivated to adhere to*. In that sense, Pollan's approach to ask people to think about and submit the rules that they personally think they could and should adhere to, might actually be a step in the right direction. From a more practical, public health perspective, it might be worthwhile for dieticians and health professionals to rely not only on educating people about the healthiness of foods, but also to encourage them to think about which times (when) and in which places (where) it is appropriate to eat certain foods. Secondly, we defined eating appropriateness standards as shared eating rules or guidelines that help direct behaviour almost self-evidently and perhaps even implicitly, thereby reducing the demand for individual's active self-regulation (Shah & Oppenheimer, 2008). This definition implies that for eating appropriateness standards to function effectively, they should represent *internalised* rules of thumb so that the number of situations in which people have to actively decide how to behave is reduced. In this respect, parents could probably play an important role by consistently adhering to their routines and rules and supporting that these rules become internalised by their children early on. As a last recommendation we suggest that eating appropriateness standards should represent *clear and simple* rules that are applicable to a range of situations. Examples of such rules could be 'soft drinks are only allowed in the weekends' or 'dinner is at six'. Of course it is not feasible to create rules that people will and can always adhere to strictly, but for these rules to function effectively, it is important that there are few exceptions to the rule and that the rule is not limited to only very rare or specific situations.

The sheer availability and accessibility of unhealthy foods in modern western societies guarantees that difficult self-regulation situations will occur. An effective system of eating appropriateness standards, appropriate to current society, can free up self-regulatory strength for exactly these situations, and give people a 'fair chance' against the strong goal conflict these situations can evoke. By supporting people in effectively exerting self-control over situations in which they might experience difficulties, shared standards would also have the potential to provide people with a stronger sense of autonomy. While still feeling like they have control over their food intake (which is highly important for people's sense of self; Counihan, 1992), people can exert this control in a more effective manner, because they will possess the resources necessary to face these situations successfully.

Concluding remarks

We have argued that poor eating appropriateness standards to regulate eating behaviour constitute an important, but often overlooked aspect of the toxic food environment. Whereas invalid, ambiguous or lacking social standards compromise self-regulation, the presence of such standards assists self-regulation. We

therefore propose that (re)instating eating appropriateness standards may help to facilitate self-regulation of eating behaviour. By no means do we intend to suggest that such standards can or should replace active self-regulatory efforts to deal with the obesogenic food environment. The ability to active self-regulate remains critical for those situations that are ambiguous. However, eating appropriateness standards may contribute to limiting the number of these situations. Future interventions to promote the self-regulation of eating should therefore focus on (also) reinstating eating appropriateness standards rather than (only) on limiting access to foods, while simultaneously enhancing self-regulation capacity to provide people with the tools to deal with those situations that remain ambiguous.

An important question is how such standards could be reinstated without imposing rules and norms that are not experienced as self-congruent, as adhering to imposed standards may compromise rather than support self-regulation (DeBono et al., 2010). Indeed, the overwhelming amount of information that is available on (the importance of) eating (e.g., nutritional guidelines, dietary advice) clearly is not sufficient to constitute a standard that guides eating behaviour, as evidenced by findings that even people who are interested in changing their eating habits do not benefit from this advice (Croll, Neumark-Sztainer, & Story, 2001; Shepherd & Towler, 1992). Even if such advice would provide self-regulation support, individuals tend to give up on this advice rather easily. One potential reason why dietary advice is not experienced as supportive may be that it is not relevant to current food practises. Pollan's previously cited book on food rules suggests that people are in need of different kinds of standards than those typically provided by health promoters. There is presumably less of a need for nutritional advice, as is often provided by dietary guidelines, than there is a need for guidelines that help navigate the toxic food environment (i.e., how to deal with the abundant presence of foods). Another potential reason why the standards provided in health promotion campaigns may not work is that they predominantly relate to what and how much to eat rather than to where and when to eat, whereas the latter questions pose more difficulties for the self-regulation of eating behaviour.

The contemporary food environment poses serious challenges for successful self-regulation, suggesting that individuals may benefit from support in their attempts to regulate their eating behaviour in the midst of plenty. Despite being often overlooked in theoretical and empirical accounts of self-regulation, eating appropriateness standards may play a crucial role in supporting individual self-regulation. Such standards make self-regulation less demanding and support individuals to save their self-regulation resources to tackle the truly difficult eating opportunities.

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