Moderate eating with pleasure and without effort: Toward understanding the underlying psychological mechanisms

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Abstract

Integrating research on elementary eating behaviors, savoring, mental imagery, mindfulness, cooking, and dinner rituals, a psychological theory of moderate eating is formulated that does not require effortful self-control and giving up on the pleasures of eating. The theory proposes that taste and pleasure can be combined with a relatively objective attitude toward food, resulting in a relatively slow, gentle, and thoughtful manner of eating that enhances satiation. The objective food attitude is thought to result from (a) the accumulation of multiple sensorimotor expectancies and perspectives and (b) a motivational mechanism underlying prosocial behavior, food sharing, and aggression-inhibiting dinner rituals.

Introduction

Currently, psychology's contribution to the explanation of eating behavior is strongly motivated by concerns about overeating and its relation to illnesses associated with overweight and obesity. A dominant assumption underlying this contribution is that eating tendencies are automatically triggered by relatively simple stimuli (e.g. amount of sugar or fat, stomach stretch, portion size, how much others eat) impinging on instinctive neurophysiological mechanisms, thereby causing sensations (e.g. taste, mouth-feel, urge to eat, fullness) and feelings of pleasure. These tendencies, however, in principle can be prevented, reduced, or inhibited through explicit symbolic reasoning about the more remote weight-related and health-related consequences of eating, and through top-down and effortful self-regulation. Consequently, interventions to reduce food intake have focused on the improvement of reasoning (often with the aid of official guidelines for healthy eating), adoption of better self-regulation strategies, and the formation of new eating habits through repeated instructions to the self, sometimes called "implementation intentions" (for reviews, see Mann et al., 2013; Stroebe et al., 2013). Complementarily, other interventions attempt to change the environment to reduce exposure to, and attractiveness of, the relevant trigger stimuli or "nudge" individuals into making healthy food choices and reducing food intake, emphasizing the benefits of "mindlessly eating better" (Leng et al., 2017; Wansink, 2010).

Researchers become increasingly aware of the limitations and even adverse effects of interventions that are based on reasoning and self-regulation and that encourage restrained or self-controlled eating and dieting. It is, for example, acknowledged that restrained eating in a food-rich environment results in hyper sensitivity to food stimuli, frequent failure to behave in accordance with eating guidelines and dieting plans, and more instead of less eating (Askegaard et al., 2014; De Ridder, 2011; Møller, 2015; Markey, 2015; Polivy and Herman, 2017; Schaefer and Magnuson, 2014; Stroebe et al., 2013). Furthermore, the ethics of emphasizing greater self-control as an answer to overeating is increasingly questioned, noticing, for example, that it may result in stigmatization of overweight individuals (Askegaard et al., 2014), which in turn may

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motivate comfort eating rather than reduced food intake (Brewis, 2014). More generally, concern is expressed about the framing of food and eating in primarily negative terms, thereby ignoring the social and cultural functions of the pleasurable aspects of food and eating (Askegaard et al., 2014; Block et al., 2011; Keller and van der Horst, 2013; Rozin, 2005).

Fortunately, recent research suggests that moderation can also be accomplished by encouraging eaters to give full attention to the pleasures of eating and without alluding to self-control. Examples include research showing that this kind of moderation can be experimentally induced by encouraging individuals to savor food (Areni and Black, 2015) or to vividly imagine the different sensations associated with eating (Cornil and Chandon, 2016a; see also Lemmens et al., 2009; Møller, 2015). Furthermore, it is also increasingly clear that certain aspects of personality and culture predispose individuals to engage in moderate eating with pleasure and without requiring self-control. For example, Cornil and Chandon (2016b) found that "Epicurean" in contrast to "visceral" eaters are passionate about food, yet prefer to eat small portions, and Rozin (2005; Rozin et al., 2011) showed that the French in particular prefer to savor food without indulging in overeating.

While different research lines suggest that moderation without self-control and with pleasure is possible, there has been relatively little theorizing about the psychological mechanisms that might underlie this kind of moderation. The goal of this article, therefore, is to formulate a psychological theory of moderate eating that does not allude to effortful self-control and that emphasizes the pleasures of eating, integrating research on cooking, dinner rituals, and elementary eating behaviors. To anticipate, it is argued, counterintuitively, that sensory processes responsible for taste, urge to eat, and pleasure (and therefore strongly associated with subjectivity) can be combined with a relatively detached, patient, and objective attitude toward food, resulting not just in slower eating, but also in a particular manner of eating that can be described as gentle, careful, and thoughtful. The objective food attitude is thought to result from (a) the accumulation of multiple sensorimotor expectancies acquired through observing self-produced sensory consequences of interacting with food during cooking and eating, and (b) a uniquely human motivational mechanism underlying exceptionally strong care, prosocial behavior, food sharing, and responsible for the inhibition of hunger and aggression-inhibiting dinner rituals. The motivational state resulting from this "subcortical" or "lateral" inhibition among motivational systems can be interpreted as a state of tolerance, patience, and relative detachment, a state easily confused with effortful and top-down self-control. The theory helps explain people's preference for food that is described as "authentic," "real," or "honest," and as originating from craftsmanship, and how these perceptions motivate a slow eating rate, which is fundamental to reducing

food intake (De Graaf, 2012). This theory critically engages with current thinking on the role of "embodied" cognition, mental imagery or simulation, and mindfulness in eating behavior (Papies et al., 2012, 2017; Petit et al., 2016). This article will also describe how the dominant psychological approach to moderate eating and the present one may be used in a complementary fashion, thus recognizing that different conditions may require different kinds of moderation.

The article is organized as follows. The next section shows that the dominant psychological approach to (over) eating is based on the influential dual-process view of the human mind according to which automatic sensory-based processes are pitted against symbolic representation and reasoning, and only a limited role is assigned to the fundamental psychological concepts of perception, consciousness, and motivation, concepts that are necessary and should be correctly interpreted to appreciate the present alternative to self-controlled eating. This is followed by the main part of the article in which the new theory of moderate eating is presented. The article ends with a discussion of the relative validity of a dual-process approach and the present alternative to moderate eating, suggesting that both approaches complement each other.

Required psychological concepts for a theory of moderate eating

An explanation of mental and behavioral activity in terms of two different processes is immensely popular in psychology and its application to the development of health-promoting interventions. Reviewing a variety of interpretations of these processes, Evans and Stanovich (2013) associate Type 1 processes with fast and automatic responding to stimuli on the basis of "innately specified processing modules" or "Darwinian modules" (p. 236) as well as over-learned associations and decision-making principles or heuristics. Included in the former modules are motivational systems or instincts that are triggered by exposure to very specific and relatively simple releasing or fitness-relevant key stimuli (Toates, 1986; Tooby and Cosmides, 1990). Sensitivity to these stimuli ensures that the organism starts to respond immediately in a biased yet fitness-promoting direction without having to wait for more complete and objective information about the environment.[1] Following this characterization, the influence of many different external stimuli on food intake can be interpreted as being mediated by Type 1 processes. These include not only olfactory and oral stimuli responsible for pleasurable taste sensations such as sugar, fat, and other nutrients (Kenny, 2015; Kringelbach, 2015), but also visual stimuli shown to have a relatively direct or automatic influence on eating tendencies such as portion size, meal variation, color and size of the plate, number of other eaters present, and how much others eat (for reviews, see Bilman et al., 2017; Spence,

2017). Furthermore, these external stimuli are assumed to interact with internal stimuli such as stomach stretch, gastrointestinal hormones, and satiety hormones associated with hunger feelings, satiation, and satiety (Blundell, 1994).

Although researchers recognize that the external stimuli may be far from simple and sometimes refer to quite complex properties (e.g. the texture and weight of food are properties that can only be discovered and perceived by means of efferent or motor activity; see later), and that expectancies and prior beliefs may moderate or mediate the influence of these stimuli on taste and eating behavior (Piqueras-Fiszman and Spence, 2015), they tend to treat them experimentally as relatively simple, primarily sensory in nature, and requiring little top-down processing or interpretation. This is especially clear from the term *gastrophysics* (Spence, 2017), used to emphasize a similarity between, on the one hand, the study of subjective and behavioral reactions to simple food stimuli, and on the other hand, psychophysics, a branch of psychology aimed at discovering and describing lawful or mathematical relationships between objective and easily manipulated stimulus intensities (e.g. luminance, sugar concentration, temperature, relative size) and subjective reports of sensations.

In contrast to Type 1 processes, Evans and Stanovich (2013) describe Type 2 processes as serial reasoning and "consequential decision-making," making "choices that are determined by reasoning about or simulation of future consequences of anticipated actions, as opposed to choices driven by experiential learning and associative strength" (p. 238). This characterization allows us to assign many models that are influential in health promotion and education such as the Theory of Reasoned Action and the Health Belief Model (Conner and Armitage, 2006) to Type 2 processes. Furthermore, what is currently studied under the heading of *self-regulation* such as the internal representation of goals, thinking about ways to realize them, instructions to the self to adhere to certain behavioral strategies (sometimes called "implementation intentions"; see Webb et al., 2006), attempts to inhibit or control impulses to behave in undesirable ways, and self-generated explanations and excuses for failing to realize health-related goals, can also be interpreted as falling under Type 2 processes (De Witt Huberts et al., 2014; Mann et al., 2013; Stroebe et al., 2013).

While Type 2 processes involve symbolic representation and language-like symbol manipulation, reasoning, or "computation," and therefore are considered more "rational," Type 1 processes are often thought to be associated with simple sensations, bias, error, "gut feelings," subjectivity, and irrationality (see also Metcalfe and Mischel, 1999). Although it is true that in some conditions people may experience an unexplainable gap between the two processes and tend to be mind-body dualists (Forstmann and Burgmer, 2015), the dual-process view misses the theoretical concepts to understand why in many other conditions people experience an intrinsic relationship between the environment, bodily and mental reactions to it, and behavior. In order to understand this experienced unity, we need a more thorough view of perception and motivation.

Sensation versus perception

Especially in studying food and eating it is tempting to equate perception with sensation (e.g. smell, sweetness, mouth-feel, fullness) and feelings of pleasure or displeasure. Perhaps for this reason *taste* has become a synonym for subjectivity. However, it has been recognized by many theorists that perception is not the same as sensation (Coren, 2003; Gibson, 1979; MacKay, 1969; O'Regan and Noë, 2001; Von Helmholtz, 1971 [1878]) and that the appropriate way to distinguish between the two is to associate sensation with temporary changes in sensory input, and perception with the formation and use of sensorimotor expectancies about invariant object properties. These properties refer to dispositions of the object to change from one state into another and can be best discovered and perceived by manipulating and viewing objects in different ways. The discovered correlation between efference or motor output and the observed (self-produced) changes in sensory or afferent input will be stored as an expectancy (of the type "what leads to what") that will be activated and updated when the object is encountered again.

Admittedly, this is more easily illustrated with the visual perception of permanent objects that are primarily internally represented in terms of their extension in three-dimensional space, shape, solidity, or movement (John Locke's so-called "primary qualities") than with food, an object which tends to be primarily described in terms of temporary sensations such as taste and pleasure (e.g. Locke's "secondary qualities"), and meant to be destroyed during eating. For example, an object like a chair can be perceived and internally represented in an objective and detached manner as an object with many different permanent spatial and material properties without the perceiver strongly feeling sensations or an immediate urge to respond to these properties. That is, only if you need to, you sit on it, feel its surface material, displace it and feel its weight, or walk around it. Even if you are currently not doing all these things, you are able to perceive the object's relevant properties (e.g. that it can support you, has a particular softness, solidity, and weight, etc.) by merely looking at the chair.

Yet, it is clear that a sensorimotor theory of perception (O'Regan and Noë, 2001) can also be applied to the perception of food texture and the experience of mouth-feel. For example, food properties such as viscosity, chewability, or stickiness need to be discovered through particular behaviors involving the hands, face, mouth, tongue, and palate. Similar behaviors may be used to discover and orally perceive the three-dimensional aspects of food objects such as their shape, size, or weight.

However, in addition to understanding how specific properties are perceived and internally represented in terms of sensorimotor networks or mental simulations, there are additional questions to be answered about the perception of objects, questions that concern awareness, perceiver-independent or allocentric representation, and the accuracy or veridicality of perception. It is quite natural to associate perception with awareness or consciousness of objects and their existence as entities that are independent from the perceiver (Coren, 2003), although the more dominant scientific interpretation of consciousness primarily refers to the subjective experience of sensations and feelings (also called *qualia*) (Carter et al., 2018; Nagel, 1969). A useful way to start explaining awareness of objects is to argue that it is based on the simultaneous activation of multiple expectancies about objects, resulting in experiencing a "view from anywhere" (Chrisley, 2001). Seth (2014) argues that the total set of activated expectancies or "rich counterfactuals" as he calls them, is responsible for the experience of "presence" or of having "direct contact" with objects apparently without involvement of specific internal representations or beliefs (see also Metzinger, 2009). Another way of expressing this is to say that in addition to expecting or mentally simulating the occurrence of specific or "modal" sensations (e.g. as a consequence of touching or tasting), perceivers internally represent the "amodal" nature (Auvray and Spence, 2008) or "thingness" of objects (James, 1985 [1892]). When activated, this amodal representation, in turn, may intensify or "capture" specific sensations (for a discussion of illusions caused by capturing, see Small and Green, 2012). As explained later, the use of an amodal and relatively perceiver-independent or objective internal representation of food objects has important implications for understanding how people can combine subjective taste and pleasure with a relatively detached and objective yet interested attitude toward food that is necessary for moderation without self-control. It will now be argued that in order to explain how people acquire this attitude, a purely sensorimotor approach to perception should be complemented with a consideration of the role of motivational mechanisms.

## Human evolution, motivation, and a motivational state mistaken for effortful self-control

Current psychological explanations of overeating are often accompanied by an evolutionary perspective on the origin of the motivational system underlying eating behavior, claiming that humans evolved in an environment in which energy-dense food was relatively scarce and difficult to obtain. Under these circumstances, a mechanism would have been adaptive that forces an individual to immediately start eating (without self-control or restraint, that is) once edible food was encountered in order to secure the intake and storage of sufficient energy. Yet, in our modern, industrial, and "obesogenic" environment with an abundance of attractive and energy-dense foods, and less need for physical activity, activation of the same mechanism causes an evolutionary mismatch, resulting in overeating and a surplus of unused bodily fat (e.g. Ahlstrom et al., 2017; Lieberman, 2013; Pinel et al., 2000; Power and Schulkin, 2009).

However, this assumption of adaptive and impulsive eating in a food-scarce environment applies equally well to many nonhuman species such as rats and lions, and does not take into account that *Homo sapiens* may have evolved unique traits that played an important role in moderating eating behavior in early humans. One of these traits is a motivational system commonly responsible for exceptionally committed and long-term care for vulnerable offspring, prosocial behavior, and in particular food sharing (Dijker, 2014a; Eibl-Eibesfeldt, 1989; Hrdy, 2009), a system that is known to strongly inhibit activity of the fight-or-flight system and feeding behavior (MacLean, 1985; Panksepp, 1998). The key hormone in mammals responsible for this appears to be oxytocin, a hormone released by a paraventrical part of the hypothalamus, where it acts on the parasympathic nervous system, producing a fall in blood pressure and cortisol levels, inhibition of flight and fear, calmness, and feelings of relaxation (Panksepp, 1998; Uvnäs-Moberg, 1998). In addition to the well-known opposite effects of the parasympathic and sympathetic nervous systems, there is also evidence for the existence of inhibitory neural pathways between the fight-or-flight and parental care system in mammals (Kirsch et al., 2005). Furthermore, and particularly relevant in the present context, culminating evidence suggests that oxytocin is not only involved in parental care and the inhibition of the fight-or-flight system, but also in down-regulating the motivational system underlying eating behavior and food intake (Spetter and Hallschmid, 2017).

It has been argued that a more generalized, strong, and easily activated care mechanism may have been responsible for the massive inhibition of aggression and egocentric tendencies that is required for human group living, cooperation, tolerance, patience, and politeness rituals (Hare, 2017; Hrdy, 2009; MacLean, 1985). Such a generalized care mechanism would respond to any sign of vulnerability, not only infantile features such as babyfaceness, begging, smiling, or play signals, but also perceived dependency and modesty (Dijker, 2014a, 2015). It has even been argued that the same mechanism may generalize to interaction with nonliving objects where it may be responsible for gentle, careful, and thoughtful behavior necessary for fine motor skills required for tool making, craft, and art (Dijker, 2018; Sherman et al., 2009). As explained later, there seems no reason not to generalize the influence of a care system to aggression-inhibiting dinner rituals (Visser, 2017 [1991]) as well as behaviors involved in cooking and the oral manipulation of food.
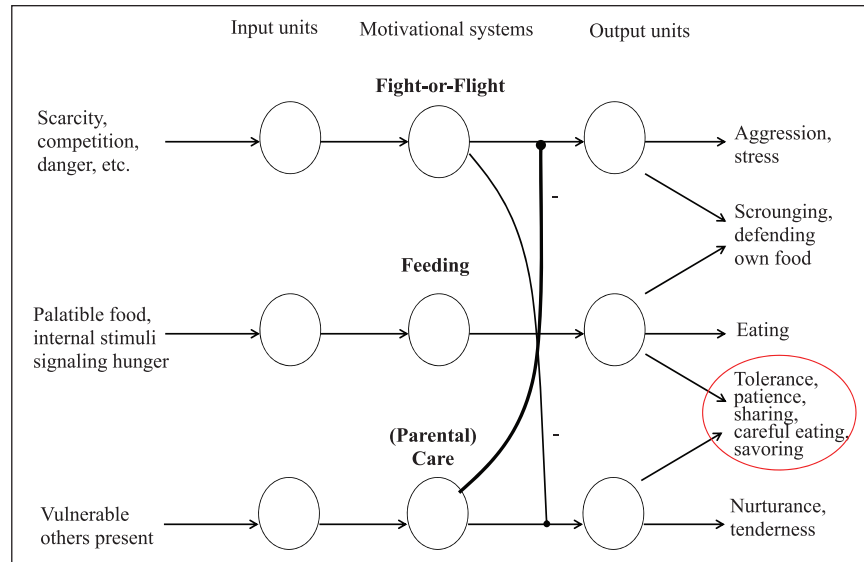
Figure 1. Highly simplified neural network showing competition and cooperation among different motivational systems involved in eating behavior. (The network does not take into account expected outcomes, feedback, and learning.) Explanation in text.

The above considerations are schematically represented with the aid of the highly simplified neural network shown in Figure 1, which is an extension of a network earlier proposed by Dijker and Koomen (2007) to theorize about the production of ambivalent reactions toward deviant but vulnerable group members. The central assumption underlying this network is that a particular situation contains trigger stimuli that can activate different motivational systems that subsequently start to compete through reciprocal or lateral inhibition, for expression in behavior, a process that has been compared with decision-making (Enquist and Ghirlanda, 2005; Kenrick et al., 2003). A particular system may "win" this competition when it happens to receive the strongest input activation and therefore is able to successfully inhibit other systems, preventing the latter from engaging in spreading inhibiting activity themselves. A competitive relationship between equally activated systems can produce qualitatively new behavior, and behavior that appears restraint or self-controlled but actually is simultaneously determined by different behavioral systems. For example, when the feeding and care system are strongly activated and the latter successfully inhibits the fight-or-flight system, a relatively relaxed and tolerant way of feeding may result. In contrast, stronger activation of the fight-or-flight and feeding system (which, for simplicity, are shown as unconnected systems in Figure 1) may cause an aggressive and defensive manner of eating. This may happen, for example, when a large portion of desirable food is perceived as scarce and food has to be taken in quickly before competitors arrive or are finished with their share of the prey.

Although this manner of describing motivational conflict originates from ethology (Alcock, 2009; Tinbergen, 1951), it was recently also embraced by Frijda et al. (2014; see also, Ridderinkhof, 2014) to provide an alternative description of impulse control than the one proposed by dual-process models in terms of effortful top-down processing. In particular, they state that "processes that regulate action are at least to some extent impulsive. These processes may not have regulation as their goal, but make way for concurrent or competing action readiness." (Frijda et al., 2014: 5). These processes "should not, in general, be seen as the outcomes of reason controlling emotion, or the rider controlling the horse" (p. 7).

To summarize, it is proposed that a motivational care system influences eating through inhibition of aggression and hunger, thereby promoting social tolerance, willingness to share food, dinner rituals, a relatively objective attitude toward food, and delay and slowing down of actual eating behavior. As explained later, activation of the system may be responsible for gentle motor output not only necessary for careful and thoughtful eating but also for skillful cooking. Together, these influences may help to explain that an exceptionally strong care system in humans may not only be responsible for the emergence of peaceful eating but also for the invention of cooking, another uniquely human behavior (Wrangham, 2009).

Embodiment, simulation, mindfulness

It is now increasingly recognized by cognitive scientists (e.g. Barsalou, 2009; Clark, 2016) and students of eating behavior (Krishna and Schwarz, 2014; Papies et al., 2017; Petit et al., 2016) that sensation differs from perception, that the latter relies on "embodied" sensorimotor processes or "simulations" by which specific or "modal" sensations are produced by imagining the behaviors that can bring them about, and that these simulations also play a role in complex symbolic

cognitive processes. Because these simulations would result in increased sensations of taste and feelings of pleasure, it is thought that they should be discouraged in order to prevent overeating. One way to do this is through prior habituation to food stimuli (Larson et al., 2014; Morewedge et al., 2010). Another way would be through induction of mindfulness. One interpretation of this concept associates it with a "nonjudgmental" mental state and adopting a relativistic attitude toward one's thoughts and sensations, convincing oneself that one's sensations are just constructions of the mind and passing mental states, a procedure termed "decentering" (Kabat-Zinn, 1982; Papies et al., 2012). Papies et al. (2012) argue that mindfulness can be used to reduce eating tendencies because it reduces mental simulations and enjoyment prior to eating, hence "decreases the subjective realism of these mental simulations" (p. 292).

But note that this is not the only way to interpret the concept of mindfulness. In agreement with the present view of perception and consciousness, mindfulness may also be associated with intense experience of, and discrimination between, sensations, hence implying a judgmental and realistic rather than nonjudgmental and relativistic attitude. For example, Brown et al. (2007) mention that mindfulness permits "the individual to 'be present' to reality as it is rather than to react to it or habitually process it through conceptual filters" or "rather than as the objects of a conceptually constructed world" (p. 212). Furthermore, authors applying the concept to eating behavior interpret mindfulness as using all one's senses to choose and eat foods that are pleasing. For example, one item of the Mindful Eating Questionnaire (cited in Monroe, 2015) reads "Before I eat, I take a moment to appreciate the colors and smells of my food." Similarly, others associate mindfulness with "a focus on gaining hedonic pleasure from small quantities of food" (Kristeller and Wolever, 2010), thus implying a connection with the concept of savoring (see later).

Of course, the puzzling thing which needs explanation is how these strong sensations can be combined with a relatively detached and objective awareness of a plate of food or meal, contributing to moderation instead of overeating. As mentioned earlier, this article emphasizes that objects such as a plate of food or meal can also be perceived in a conscious, relatively perceiver-independent, "amodal" or objective way (Auvray and Spence, 2008). Such a perception requires that, in addition to simulations of specific or modal sensations, multiple sensorimotor expectancies are simultaneously activated and accompanied with a particular motivational state.

A theory of moderate eating, integrating cooking, dinner rituals, and eating behavior

Using the concepts of perception, consciousness, and motivation that were critically discussed in the previous section, Figure 2 presents a model describing how different

behaviors contribute to moderate eating by creating or manipulating an object (elementary food items, a plate of food, a meal) in different ways, thereby causing perceived changes in the object and contributing to the acquisition of an increasingly complete sensorimotor representation or perception of the object and its multiple properties. Together with an activated care system that inhibits egocentric eating tendencies and causes a relatively detached but caring motivational state, this representation results in a relatively objective and detached attitude toward the food. Yet, this attitude may combine with, and even contribute (through a process of "capturing" a particular sensory modality through activation of an amodal representation of the object) to the experience of temporary but vivid taste sensations and feelings of pleasure.

With respect to behavior in the model, elementary eating behaviors that are guided by an objective attitude and a care system appear gentle, thoughtful, and careful, causing a slow eating rate and hence reduced food intake. This careful behavior is not only demanded or "afforded" (Gibson, 1979) by specific object properties (e.g. fragility or chewability), but also by the perception of more elusive properties such as the food's quality, honesty, and authenticity, as further explained later.

Cooking is assumed to contribute in two different ways to the acquisition of these attitudes and hence moderate eating. First, cooking not only involves multiple manipulations, and hence the formation of multiple expectancies about different physical food properties (e.g. solubility, viscosity, response to heating or cooling), but also can be considered a craft. Although, still an elusive concept without much psychological theorizing, an analysis of craft in terms of its technical, moral, and aesthetic aspects makes clear that cooking can help the cook (whether a professional, hobby cook, or a nonprofessional engaged in everyday home cooking) to acquire a conscious and objective attitude toward food that, together with increased attention to sensory experiences, helps to create a product that tastes good and has quality. As proposed later, the technical, moral, and aesthetic aspects of cooking are thought to commonly depend on the activation of a care system.

Second, to the extent that eaters recognize that a plate of food or a meal originates from craftsmanship (e.g. because they are experienced cooks themselves, or are informed of the production process and the cook's intention to make a craft object), they may attribute the same moral aspects and quality to the food as the craftsperson intended it to have, come to see the food as "authentic" and, especially important in the present context, treat the food carefully, with a relatively detached yet interested attitude. The result will be a manner of eating that can be described as moderate, thoughtful, or savoring.

Finally, the model presented in Figure 2 assumes that dinner rituals contribute in important ways to this manner of eating. In particular, table manners can be interpreted as
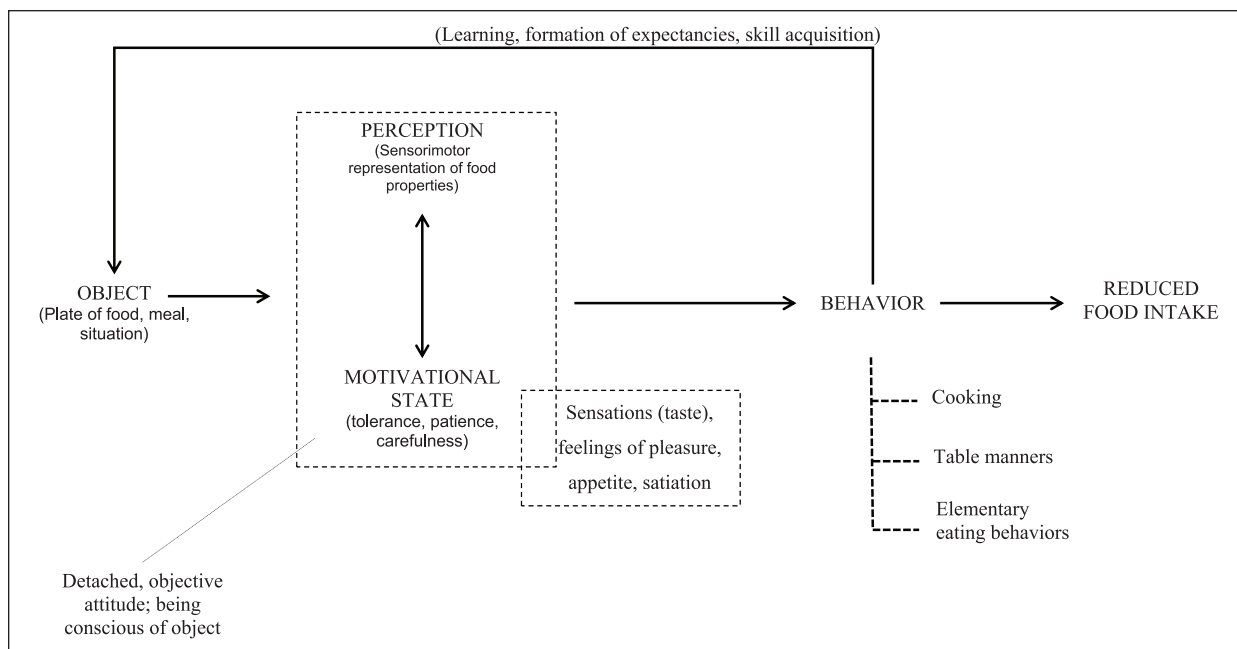
Figure 2. A model of moderate eating depicting relationships between the fundamental psychological concepts of (object) perception, motivation, and behavior (explanation in text).

politeness rituals, functioning to reduce egocentric and competitive eating and induce helping and sharing behavior (Visser, 2017 [1991]), thereby contributing to increased detachment, delay, and the slowing down of eating. Elementary eating behaviors, cooking, and dinner rituals will now be considered in greater detail.

Elementary eating behaviors

By now, it has been well established that slower eating contributes to a reduction in food intake (Robinson et al., 2014). In particular, it is assumed that slower eating results in longer and more intense oral exposure of nutrients to the sensory units involved in flavor perception, resulting not only in physiological responses preparing the body for food intake and promoting appetite (so-called "cephalic phase responses"), but also hormonal responses that signal satiation before food enters the stomach. In contrast, fast eating reduces oro-sensory residence time and results in later meal termination and larger food intake (De Graaf, 2012). Because slow eating of a small amount of food and fast eating of a large amount of food are equally effective in causing satiety, eating rate does not affect feelings of hunger and satiety after meal completion (Robinson et al., 2014).

In addition to measuring slow eating in terms of eating rate, it has also been experimentally manipulated by explicitly instructing research participants, for example, to chew a particular number of times, take small or large bites, use a small or large spoon, or simply engage in slow or fast eating (Robinson et al., 2014). In addition, eating rate has been

manipulated by varying food texture, reasoning that some textures require more chewing and intra-oral manipulation than others (e.g. De Graaf, 2012; Forde et al., 2017). It seems plausible to expect that variation of intra-oral manipulation of food also positively affects oro-sensory exposure to food nutrients and hence contributes to more vivid sensations and early and stronger signaling of satiation, although a relationship between this variable and food intake has not yet been established. For example, De Wijk et al. (2003) found that in normal eating, oral manipulation is quite extensive and varied, resulting in relatively intense taste sensations and mouth-feel. However, instructing eaters to limit their inter-oral manipulation to only one or two manipulations considerably reduced tastefulness.

For the present purposes, it is not only important to understand how eating rate (and its association with oro-sensory exposure and taste) can be manipulated through instruction, adoption of eating rules, or changing a food's chewability, but also how elementary eating behaviors associated with slow eating depend on attentional, perceptual, and motivational processes, and how hedonic experience and pleasure are involved in this kind of eating.

As a first attempt, one might describe slow eating whereby one is increasingly exposed to taste sensations as *attentive* eating and associate it with greater *awareness* of food properties and taste. However, paying more attention to food and eating may imply that attention to the hedonic aspects of food increases, thereby promoting impulsive or external eating (Kavanagh et al., 2005). This concern motivates several researchers to advocate reducing attention to

food and its associated sensations in order to attack over-eating (Jones et al., 2016; Papies et al., 2012; Stice et al., 2016).

Areni and Black (2015) offer a particularly promising way to explain how increased attention to food may reduce rather than increase food intake without giving up on the pleasures of eating, using the concept of savoring (Bryant and Veroff, 2007). They interpret savoring as slowing down eating and paying more attention in order to prolong and intensify the pleasurable experiences associated with a limited opportunity to eat desirable food. As pointed out, slowing down eating, in turn, results in faster and higher satiation and less desire to eat more through an increase in oral processing time (De Graaf, 2012).

In one of their experiments, Areni and Black (2015) found that participants told to expect a relatively small portion of chocolate (two pieces instead of all six pieces on display) engaged in slower eating and showed a higher level of satiation or less desire to consume more chocolates than participants expecting to consume a large portion (all six pieces on display) but who were stopped after consuming two pieces. In addition, they found that in the small portion condition, participants paid relatively more attention to the food and took longer to describe their experience of eating the food. Using a somewhat different manipulation of expected portion size (this time increasing portion size unexpectedly after tasting two pieces of chocolate), Black and Areni (2016) additionally could demonstrate that participants in the small portion size condition waited longer to consume their two pieces of chocolate and actually ate less additional chocolates than participants in the large portion condition.

Although the authors did not explicitly measure pleasure or enjoyment (their attention measure merely alluded to different ways of experiencing sensory pleasures), these two studies suggest that moderate eating can go together with pleasure when individuals pay close attention to the food they are served, and that the concept of savoring may be useful to start inquiring about the underlying mechanisms.

A concept very close to savoring and introduced by Cornil and Chandon (2016a) is "multisensory imagery." These researchers directly manipulated attention to food and eating by asking participants to vividly imagine and carefully observe the different sensory consequences of eating three different hedonic foods (e.g. three different foods partly consisting of chocolate or chocolate mousse, strawberry pie, and vanilla ice cream). Compared to a control condition (e.g. nonfood imagery or imagined satiation resulting from imagining eating a chocolate cake 30 times), participants engaged in this "multisensory imagery" both anticipated greater enjoyment and preferred smaller portions of a chocolate brownie or cake to consume during a second stage of the experiment. The authors do not use the concept of savoring to explain these results but argue that participants engaging in multisensory imagination prior to eating better realize that they can prevent satiation and its associated pleasure reduction by choosing a smaller portion of food to eat. However, their explanation bears resemblance to the one proposed by Black and Areni (2016) in terms of anticipatory savoring. In particular, multisensory imagination by itself may involve focusing attention on, and savoring of, an (imagined) small amount of food.

Indeed, both the concepts of savoring and multisensory imagination may be closely related to the particular quality of behavior associated with what is commonly called *tasting*, behavior requiring considerable care and gentleness. In particular, in order to experience the different sensations associated with taste, one needs to bring small amounts of food to the mouth and nose, and attentively, slowly, and carefully manipulate them with the mouth and tongue in order to discriminate the resulting sensations. Interestingly, words used in other languages to refer to tasting, show a stronger association with the required motor aspects and small sample sizes. For example, the German *prüfen* and Dutch *proeven* derive from the Latin verb *probare*, which more clearly refers to taking small samples for trying and testing quality. (There are also words expressing the opposite motor qualities that are required for tasting, emphasizing that large amounts of food are simply loaded into the mouth and chewed with brute force and speed such as *wolfing down* or *gorging*.) Thus, when participants in Cornil and Chandon's (2016a) mental imagery condition selected relatively small portions of food for actual consumption, they may simply have wanted to continue a process of tasting and savoring that was already started during imagined tasting.[2] Savoring, multisensory imagery, and tasting also bear resemblance to a particular interpretation of mindfulness according to which individuals use all their senses to choose and eat foods that are pleasing (see previous section).

Interestingly, both a tendency to savor food and engage in moderate eating can be especially found among individuals and cultures that intensively engage with food, in terms of cooking, appreciation of food quality, duration of the meal, and conversation, all likely to contribute to the acquisition of an objective and multi-perspective representation of food. For example, Cornil and Chandon (2016b) developed a scale to measure individual differences in what they call "Epicurean eating" (highly similar to a capacity for savoring food), consisting of items such as "If I try, I can clearly and easily imagine the taste of many dishes," "I like to discuss the taste of food with my friends," "There is a lot of beauty in food," and "More than other people, I value the look, the smell, the taste, the texture in mouth of foods." They found a negative correlation between this scale and a "visceral eating" scale measuring impulsive eating on the basis of external stimuli only and a scale measuring concerns about eating, and a positive correlation with a preference for small portions of food. The scale did not correlate with BMI. From these results, the authors conclude that

unconcerned and enjoyable eating can go together with moderate eating and reduced food intake.

Also suggesting a relation between savoring and moderation, Rozin (2005; Rozin et al., 2011) showed with an extensive research program that the French eat less but with more enjoyment, less concerns about health, and greater attention to the quality of food and the social and experiential aspects of the meal than American people.

It is important not to confuse savoring with self-regulation and restrained eating. For example, it has been argued that savoring practiced by the French population indicates that the French are especially good at exercising self-regulation because they can draw upon eating rules or standards (De Ridder et al., 2013). These standards are thought to be actively used for purposes of self-control: "(. . .) the French are able *to deal with* the delicious foods surrounding them much better than the Americans. (. . .) the French *can handle these situations* better because they can rely on clear guidelines that characterize their food culture" (De Ridder et al., 2013: 153, italics added). However, these cultural "rules" may be nothing but explicit *descriptions* of habitual ways of eating whereby food quality, cooking, eating together, and savoring small portions of food are highly valued (Rozin, 2005), resulting in relatively high expected or actual satiety, and reduced interest in additional unhealthy snacking or overeating.

A similar confusion may arise in scales developed to measure self-regulated eating. For example, several items of De Vet et al.'s (2014) self-regulation scale seem to confound not wanting or disliking unhealthy food, snacking, or overeating with active attempts to engage in self-control. For example, different scale items ask people whether they "*make sure* that they don't go to fast-food places [if I am in town]," or "*avoid* the candy department [if I go to the supermarket]" (see De Vet et al., 2014, italics added). It seems possible that people who dislike fast-food, candy, or snacking in-between meals will agree with these items, even if they disagree with the implication that they actively engage in effortful self-regulation. Other items of this scale may confuse the savoring of small portions of food with active attempts to avoid overeating: "If I want to have a treat, *I take a little bit* and put the rest out of sight" or "If I want to eat candy, *I take a few* and put the rest of the bag away" (italics added). Again, people may agree with the eating part but disagree with the implication that the additional behavior involves self-control.

To conclude this section, the motor aspects of slow eating and hence reduced food intake can be fruitfully described in qualitative or motivational terms, making clear that moderation can go together with increased attention to food and pleasure, and does not require self-control. However, although savoring has been explained in instrumental terms as a way of extending the experience of pleasure (Areni and Black, 2015), this explanation may not be sufficient. I propose that the food one is savoring needs to be perceived and internally represented as a real object with permanent and perceiver-independent properties, and is viewed in a detached, patient, and objective manner. This representation in turn may "capture" and intensify multiple sensory influences to help induce savoring and enjoyment without increased attention to hedonic aspects resulting in overeating. Cooking may help to acquire such an internal representation.

Cooking and craftsmanship

An important reason why home cooking, especially cooking and baking from scratch with as few industrially processed ingredients as possible, has received considerable research attention in the area of health promotion is because it is assumed to empower people to select and prepare foods that constitute a healthy diet. Reviews of both intervention (e.g. Reicks et al., 2014) and observational studies (Mills et al., 2017) indeed show that home cooking is associated with favorable dietary outcomes such as a higher consumption of vegetables and fruit, stronger adherence to a Mediterranean diet, and less consumption of industrially processed foods. To the best of my knowledge, however, amount of food eaten and moderation more generally have never been included as outcome measures of home cooking. Furthermore, the psychological determinants of cooking, and if and why cooking results in an attitude toward food that motivates moderate eating, have received limited attention. Instead, recent descriptions of home cooking strongly focus on the importance of acquiring cooking skills and knowledge, using broad concepts such as "food literacy" (Vidgen and Gallegos, 2014), "food agency" (Trubek et al., 2017), or "food well-being" (Block et al., 2011). Knowledge often refers to awareness of information about particular nutrients that may negatively or positively affect health (Lavelle et al., 2016; Palumbo et al., 2017; Wolfson et al., 2016). Barriers to cooking such as not having enough time, limited financial resources, and household composition (e.g. living alone) are also frequently mentioned (Mills et al., 2017). The emphasis on competence and knowledge is also reflected in the behavioral change techniques that have been used in interventions aimed at encouraging home cooking. For example, examples of the top six techniques include the following: provide instruction on how to cook, practice cooking, provide information on the consequences of excess saturated fat and sugar, and take away different barriers (Hollywood et al., 2017).

When it comes to measuring motivation to cook, researchers focus on "enjoyment" without further specifying to what motivational and sensory aspects the term refers (Hartmann et al., 2013; Jones et al., 2014; McGowan et al., 2016; Wolfson et al., 2016) or "intrinsic motivation" (Deci and Ryan, 2000) and in particular its two components, positive feelings of competence and autonomy (Dohle et al., 2014; Lahne et al., 2017; Norton et al., 2012).

A serious omission in research on attitudes toward cooking is a consideration of how people perceive the product of their cooking—the plate of food or the meal—and the motivational consequences of this perception. Hobby and gourmet cooks not only talk about acquiring technical skills and dexterity but also about realizing something that has good taste, elegance, beauty, and high quality (Costa et al., 2007; Hartel, 2007; Szabo, 2013).[3] A too strong focus on enjoyment or intrinsic motivation may give the wrong impression that motivation would not be externally triggered by imagining, looking at, or tasting the final product, and that continuous sensory feedback from interacting with materials and equipment would be less important. Interestingly, when Dahl and Moreau (2007) conducted qualitative interviews about creative activities in different hobby areas (including cooking), they found the following as an important reason for these activities: "Producing something tangible is a really nice feeling" (p. 359). The concept of craft seems ideal to start understanding how motivational aspects of cooking and perceiving its products may contribute to moderate eating.

Craft as an ideal concept to understand the motivational aspects of cooking

Craft and craftsmanship refer to the handmade production of objects that are not only useful (e.g. pottery, furniture, clothing) but also pleasurable in an aesthetic sense, involving different senses (e.g. beautiful to look at or hear, and perhaps also good to taste) (Crawford, 2015; Pye, 1968; Risatti, 2007; Sennett, 2008). Yet, there is more to craft than combining technical skill with intention to produce something of beauty, and that is its association with morality, revealing the true reasons why we love the handmade, the presence of imperfections, and the attribution of the elusive property of quality to a product. Although the use of machines and industrial work allow for an enormous increase in precision, perfection, and standardization, it can be argued that craftsmanship is associated with a special kind of reliability, perfection, and quality that is missing in machine-dependent production. It derives from the craftsperson's motivation, intention, and effort to be perfect, and to care about producing something of quality, traits that cannot easily be attributed to machines (Crawford, 2015; Pye, 1968; Risatti, 2007).

From descriptions of both the craftsperson's activities during production and the quality of the product itself, it can be inferred that *care* must be an important motivational determinant of craft, linking craft directly to morality. Indeed, it may be argued that the earlier proposed care mechanism is central to craft and the recognition that certain artifacts originate from craft. For example, after describing pottery and other crafts, Risatti (2007) observes,

In all these cases, the material is gently urged into a functional form, a functional form to which the material is naturally predisposed, but still somewhat resistant. When done properly, technique in craft is never a violent encounter of hand with the material world, but a natural coming together of hand, material, and form. (p. 102)

(. . .) rather than the alienation of technique, material, and hand that is found in machine production, in craftsmanship, of necessity, there is respect for [irregularities in material], a respect that unites them in the formalization of the craft object. (p. 195)

Interestingly, as an intrinsic aspect of craft, beautification of the craft object too may be seen as an expression of care, protection, and nurturance. Thus during initial stages of making craft objects, the object is perceived as a vulnerable object that needs to be treated with care and brought into a less vulnerable and more mature shape by allowing it to "grow" or develop according to its inherent material properties, with the tool maker facilitating this with a gentle and protective attitude, involving activities such as cleaning, polishing, inspecting, touching, testing, and reshaping, all referring to beautification (Dijker, 2014b). The final result may be something that is perceived as "handsome" (Risatti, 2007). Together, technical, moral, and aesthetic aspects of craft contribute to the formation of an increasingly complete and objective attitude toward, and heightened consciousness of, the craft object itself. Such a view agrees with Kant's description of aesthetic feeling as "disinterested interest" (see Scruton, 2011), which is not to deny that elementary physical features of objects such as their curvature, symmetry, color combination, or brightness (Lindell and Mueller, 2011), and in our case taste, would not contribute to the perception of beauty.

Perceiving food as an object of craft: explaining the attribution of quality, authenticity, and honesty to a plate of food

Many industrial products are advertised as being handmade and associated with craftsmanship, passion, care, and love, obviously to make these products more attractive to consumers (Fuchs et al., 2015). The involvement of a care system in the perception of quality is also expressed by terms such as *honest, precise*, and *reliable* (see also Risatti, 2007: 196). In contrast, a work of craft or art tends to be negatively evaluated if it is associated with an easier and less risky way of production (e.g. by relying on machines for mass production) or with "cheap" or self-interested motives (Bloom, 2010; Sennett, 2008).

A concept closely associated with quality and care or love is authenticity (see also Newman and Smith, 2016). Its frequent use to describe food products supports the present

analysis of food perception in terms of objectivity, contact with reality, and quality. In particular, use of the word *authentic* expresses an attempt to trace the product down to a particular person, living in a particular area and historical period, and associated with traditional rules of production that have proven to result in high quality. Indeed, in their analysis of gourmet journals, Johnston and Baumann (2007) found that reference to authenticity is frequently used to accentuate the quality of food, associating it with honesty, sincerity, care, closeness to nature, simple or small-scale production techniques by farmers and artisans (who are often presented as being threatened by industrial producers and hence as vulnerable), and relative absence of commercial motivation, all culminating in food that can be considered "the real thing" (Porter et al., 2017). A similar terminology is employed by Italy's "slow food" movement (Sassatelli and Davolio, 2010).

That these descriptions may have consequences for food liking, taste, and eating behavior is suggested by studies showing that knowledge of the food's origin improves liking and perceived quality (Stefani et al., 2006) and that the tastefulness of cheese is partly determined by associating it with farm life and kindness to animals (Lahne and Trubek, 2014). Interestingly, watching the cooking process while tasting food may enhance the reliability and consistency of taste judgments, sensory awareness, and differentiation between different tastes (Hathaway and Simons, 2017).

To summarize, a central theme in food descriptions in terms of authenticity, honesty, and love or care seems to be the perception of vulnerability; the food is seen as vulnerable and precious because it is associated with a way of production that is threatened to disappear. This also explains the connection between authenticity and issues of naturalness, purity, and kindness to animals. In so far as the earth as a whole is seen as vulnerable and in danger of being polluted and destroyed, these perceived aspects of food may even extend to issues of sustainability, which in turn may contribute to activation of a care system. Although there is as yet no evidence that these kinds of descriptions or labels facilitate slow eating and hence reduced food intake, it can be hypothesized that they may affect the manner of eating as well, answering to the principle "that which is made with care or love, should be treated with care or love."[4]

Dinner rituals

It is only recently that the psychological aspects of rituals receive theoretical attention (Hobson et al., 2018) and that the consequences for eating behavior are systematically examined (Ratcliffe et al., 2018). However, while these authors describe diverse "functions" of rituals such as better self-regulation, coping with stress and anxiety, enhancement of pleasure, and social bonding, the motivational mechanisms bringing about specific rituals and their evolutionary origins are left unaddressed. Adopting an ethological

perspective, it is argued here that a very important class of rituals emerged from the adaptive value of aggression reduction within species and that competition between conflicting motivational systems provides the responsible mechanism. For example, Lorenz (1966) and Huxley (1966) explained greeting and mating rituals in terms of competition between systems for aggression, fear, and sex with the outcome being determined by how strong each of these systems gets activated during social interaction. For example, an attractive mate may not only motivate approach but also fear and aggression when both individuals come too close, which may be followed by retreat and displaced fake attacks on other objects, as well as a new approach when fear is reduced and attraction increases again. Often, the result is a behavioral sequence that appears exaggerated (hence suitable to function as a new social signal), seemingly self-controlled and restrained, and obsessively focused on the precise execution of the behavior.

It has also been argued that many social and aggression-reducing behaviors and politeness rituals involve displays of vulnerability and infantility (e.g. making oneself small, smiling, bowing one's head, different kinds of modesty, shedding of tears), thereby activating a care motivation (Dijker, 2014a; Eibl-Eibesfeldt, 1989; Keltner et al., 1997). Highly relevant in the present context, Visser (2017 [1991]) has provided an anthropological analysis of dinner rituals, stressing that their main function is to reduce aggression:

> Behind every rule of table etiquette lurks the determination of each person present to be a diner, not a dish. It is one of the chief roles of etiquette to keep the lid on the violence which the meal being eaten presupposes. (p. 3)

She provides multiple examples of behaviors that reduce aggression, from letting others take the first bite, eating with tooth covered, placing knifes with the sharp edge turned inside, never taking up a new morsel while one is still chewing (in order to avoid the impression that you want to take your companion's share of food), and thanking the host. Probably, the clearest example of nonaggression is the opposite of egocentric eating shown in "helpings": Offering food to your neighbors before taking it yourself. (Of course, many rituals prior to eating or not performed at the table also seem relevant for creating a nonaggressive, relatively detached, and caring atmosphere, such as the welcoming of guests, gift exchange, carefully dressing the table, washing hands, or prayer and thanksgiving.)

This anthropological perspective qualifies and extends Elias' (1939) emphasis on the status enhancing function of dinner rituals during the last five centuries. That is, it seems likely that from the very beginning of human group living, dinner rituals must have been present in rudimentary form in order to eat peacefully together (see also Fischler, 2011). The possible role of a motivational care system in dinner rituals agrees nicely with the earlier presented neural network (see

Figure 1) in which this system is shown to compete with systems responsible for aggression and feeding.

Vohs et al. (2013) showed that even very simple and temporary rituals without any social meaning may increase savoring, eating time, and enjoyment and valuation of the food. What rituals seem to accomplish with respect to moderate eating is a strong focus on the precise execution of behavior (Hobson et al., 2018), thereby leaving the food object on which that behavior is centered protected and intact as long as possible. It is not denied here that the performance of rituals requires some sort of planning and behavioral control. Yet, what is doubted is whether the performance of dinner rituals involves self-control as usually defined in the context of eating: as the effortful suppression of impulsive eating. Rituals are special in the sense that they involve commitment and intrinsic motivation (sometimes even obsession) to carry out the necessary steps with precision, thereby facilitating distraction from both food and hunger signals.[5]

Combining the multiple influences on elementary eating behaviors to facilitate moderation

As mentioned earlier, a slow eating rate can be considered a key behavioral factor in reducing food intake. The present theory of moderate eating extends this idea by showing how cooking, perception of the food object as an object of craft, and dinner rituals motivate a particular manner of eating that can be characterized not just as slow but also as delayed, careful, and thoughtful, and allowing considerable room for savoring. Consider how the different aspects of eating complement each other. Imagine a table surrounded by diners ready to start eating, with the cook also sitting at the table. While the cook describes the cooking process, thus enabling the perception of the meal's authenticity, the diners attentively look at the food in front of them, vividly imagining the different textures and tastes they are about to experience. After an elaborate process of offering helpings to each other and controlling that everyone is served equally or to individual satisfaction, the diners make sure that they start taking the first bite at exactly the same moment. Then, the process of careful tasting, savoring, and expressing of delight and praise for the cook proceeds.

Discussion and conclusion

After critically examining several core psychological concepts used in the psychology of eating, this article has sought to integrate the inherently social nature of eating with psychological processes involved in the perception, internal representation, and behavioral manipulation of food. In particular, it was shown how a characterization of moderate eating as a particular *manner* of eating, and an appropriate interpretation of the concepts of perception,

consciousness, and motivation result in a better understanding of how good taste and enjoyment can go together with a relatively objective and detached attitude toward a plate of food or meal. It was concluded that this attitude results in gentle and thoughtful manipulation (manually and orally) of food, which in turn may affect food intake. Thus it was argued that moderate eating is possible without self-control and without giving up on the pleasures of eating. The presented approach helps to provide a common psychological basis for what is currently considered a more holistic approach to food and eating which uses broad concepts such as food well-being (Block et al., 2011), food literacy (Vidgen and Gallegos, 2014), food agency (Trubek et al., 2017), the conscious meal (Sporre et al., 2015), or gastronomy (Klosse, 2013). Furthermore, this approach also qualifies and extends current usage of the concepts of embodiment, mental simulation, and mindfulness in research on eating. According to the present perspective, mental simulation is necessary for savoring, tasting, and a slow eating rate, and therefore should not be discouraged. Furthermore, mindfulness, as used here, implies realism rather than relativism or skepticism: full use of the senses in combination with being in touch with reality, tangibility of food ingredients, and positively valuing the "authenticity" of the products of cooking.

It is now time to recognize that modern conditions of living are far from ideal to engage in moderate eating with pleasure and without self-control and that under these conditions the dominant dual-process perspective on eating behavior may accurately describe and effectively promote moderate eating. In particular, the dual-process view is well-suited to explain and influence eating behavior under conditions in which decision-making and behavior are based on a dissociation between sensory and symbolic processes. This may be the case when individuals are unable or unmotivated to consciously perceive food objects as permanent and perceiver-independent objects and merely seem to react to variable sensory input with temporary sensations, typically modern conditions under which individuals act under time-pressure, stress, cognitive load, or distraction (Robinson et al., 2013). At the same time, individuals may be keenly aware of, and engage in symbolic reasoning about, the negative health-related consequences of their eating behavior and try but fail to engage in self-regulation and experience dissociation between sensation and reasoning. However, the alternative approach to moderate eating proposed here requires sufficient time, attention, and interest in cooking and eating for the development and use of a conscious and relatively detached, objective, and patient perception of food objects.

Recognizing that different conditions call for different kinds of moderation—one based on self-regulation, the other on a combination of pleasure and a detached and objective attitude necessary for savoring—implies that the dominant psychological perspective and the present

approach may be used in a complementary fashion to promote moderate eating. For example, in situations where savoring is not possible, people may explicitly think about the goal of seeking conditions that facilitate it and acquire and use the relevant implementation intentions. Yet, it is especially important to prevent people from engaging in self-regulation and being concerned with the official guidelines for healthy eating when cooking, dinner rituals, and slow eating are possible.[6]

This article has argued that especially the connection between food and craftsmanship may help to induce a perception of food that can motivate moderate eating. Again, it seems clear that the conditions under which this may happen may be difficult to realize. There are many obstacles that prevent people from starting to cook themselves or from appreciating the craft of cooking behind food products, including lack of time, lack of confidence, and lack of friends or family members that are passionate about cooking. Complementarily, the media may present cooking in ways that may demotivate an individual to start cooking by oneself and disconnect it from craftsmanship. For example, celebrity TV cooks may give the impression that cooking is primarily a creative form of art, focused on producing beautiful and complex products that take a lot of time and skill to produce (a process of which only fragments tend to be shown by means of nervous camera movements). In addition, programs featuring these cooks tend to present cooking as entertainment and competition. It should therefore not be surprising that these programs have limited impact on people's habitual dietary intake (e.g. Villani et al., 2015). As argued earlier, to develop a passion for cooking or for "homemade" food, it may be necessary to see cooking as a craft rather than art. In craft, aesthetics and creativity are closely connected to skill, concentration, the use of reliable recipes, discipline, care for food and diners, and morality. Only a few TV cooks may be able to communicate these values to the general public without indulging in entertainment.

In order to cope with the many conditions under which people cannot engage in moderation in the presently proposed sense, it seems important to acquire a general and strong attitude toward food, one that motivates moderation through savoring whenever situations are recognized to allow for this. Such an easily activated attitude should be based on (1) beliefs about the scarce, vulnerable, and special nature of food sources and the role of moral decision-making and behavior in producing tasty food; (2) the development of cooking skills and associated appreciation of cooking as a craft; and (3) perceptions not directly related to food that increase the likelihood that a care mechanism will be activated, ensuring a generally care-based and gentle approach to other people as well as food. Hopefully, this article has contributed to laying the theoretical foundations for studying that attitude in greater detail.

Notes

1. Although the focus in this article will be on the association between Type 1 processes and sensory input relevant to eating, it should be remembered that these processes also refer to decision rules or automatic associations originating from symbolic reasoning and decision making that are typical for Type 2 processes.
2. For savoring to occur, food not only needs to be perceived as having high quality (which in turn may be associated with scarcity or effort and costs related to producing it) but also actually has to be served in relatively small portions. Larger portions of high quality food presented as scarce and special may still be wolfed down, eaten with greater bites (Fisher et al., 2003) and motivation or eagerness (Burger et al., 2011; Herman et al., 2015), and result in increased food intake (Sevilla and Redden, 2014). For a review of research showing the pervasive influence of portion size on food intake see Zlatevska et al. (2014). Also note that the effects of savoring on food intake should not be confused with the effect of prior habituation to food stimuli on subsequent eating, the latter resulting in *reduced* anticipated pleasure prior to actual eating food. For example, when Morewedge et al. (2010) asked their participants to vividly imagine eating 30 M&M's or 30 cheddar cheese cubes, subsequent willingness to actually consume the food decreased compared to different control conditions. Larson et al. (2014) stimulated prior mental simulation of eating by asking participants to repeatedly judge foods shown in pictures, and found decreased enjoyment (and apparently increased satiation) during subsequent consumption.
3. It is important to mention that not only gourmet but also everyday cooking may involve behaviors that can increase liking for a plate of food. For example, Norton et al. (2012) demonstrated that their research participants liked the things they made themselves such as an IKEA box, folded origami, or a construction made from Legos better than comparable products made by others, even if the latter were experts and performed better. A similar "I cooked it myself" effect has been demonstrated with making food (Dohle et al., 2014). These authors demonstrated that participants overvalued the milkshake they made themselves with the aid of a recipe. Of course, this "IKEA effect" does not necessarily prevent overeating, especially when increased liking results in making larger portions for oneself.

4. The association of a plate of food with skill, effort, and passion may additionally motivate eaters to feel admiration or respect.

5. The influence of social aspects on eating behavior is far more complex than can be treated in this article. For example, research on social facilitation (for a review, see Herman, 2015) and modeling (for a review, see Cruwys et al., 2015) suggest that the presence of other people often encourages rather than reduces overeating.

6. It should be noted that moderate eating does not necessarily imply that one always selects food to eat that is considered healthy by modern scientific standards, a point also made by Rozin (2005) in describing the French eating culture. However, the present description of perceived food quality and authenticity or "realness" suggests that there may be a close association between moderate and healthy eating. In particular, a combination of, on the one hand, strong interest in the origin of food ingredients and food production, and on the other hand, experiencing different tastes, helps to ensure that most products that are selected for cooking will be fresh and unprocessed, and that "unhealthy" additions necessary to enrich taste will be consumed in relatively small quantities. In contrast to most studies on the health benefits of home cooking, however, it is not assumed here that these benefits are realized through explicit health concerns or knowing what is "good" or "bad" to eat.

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