



Learned pleasure from eating: An opportunity to promote healthy eating in children?



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ABSTRACT

Across the lifespan, eating is a common everyday act driven by the search for pleasure and reinforced by experienced pleasure. Pleasure is an innate indicator of the satisfaction of physiological needs, in addition to other attributes. Pleasure from eating is also learned and contributes to the development of children's eating habits, which remain mostly stable until adulthood. Based on classical models of determinants of food consumption behaviour, we identified three dimensions of pleasure from eating learned during childhood: 1/the sensory dimension, i.e., pleasure from sensory sensations during food consumption; 2/the interpersonal dimension, i.e., pleasure from the social context of food consumption; and 3/the psychosocial dimension, i.e., pleasure from cognitive representations of food. The objective of this narrative review is to explore whether these three dimensions may play a role in promotion of healthy eating behaviour among children. Up to now, it was assumed that providing nutritional information, pointing out which types of foods are “good” or “bad” for health, would drive healthier food choices in children. Today, we know that such strategies based on a cognitive approach toward eating have a limited impact on healthy choices and can even be counter-productive, leading children to avoid healthy foods. In the context of increasing rates of childhood obesity, new perspectives are needed to build efficient interventions that might help children adopt a healthy diet. This review suggests new directions for further research to test the efficacy of novel interventions that emphasize pleasure from eating.

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1. Introduction

Eating is one of the first needs of a child when he or she enters the world and is a primary source of pleasure. This innate pleasure

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from eating is closely linked with the satisfaction of physiological needs. New borns and infants particularly enjoy the sweet taste, which is a gustatory indicator of food energy density (Schwartz, Issanchou, & Nicklaus, 2009; Steiner, 1979). As an innate adaptive feature, newborns experience pleasure from energy-dense foods that guarantee their survival. In addition, infants are able to adjust their intake to the energy density of foods in such a way that they consume enough food to cover their needs, especially after having learned about the energy density of foods (Fomon, Filmer, Thomas, Anderson, & Nelson, 1975). However, as children grow, this self-regulation capacity progressively decreases (Fox et al., 2006; Kral et al., 2012; Remy, Issanchou, Chabanet, Boggio, & Nicklaus, 2015), while the sweet taste remains highly appreciated (Desor, Greene, & Maller, 1975; Schwartz et al., 2009; Zandstra & De Graaf, 1998), as are energy-dense foods (Drewnowski, 2009; Gibson & Wardle, 2003; Nicklaus, Boggio, & Issanchou, 2005). Knowing that the hedonic processes experienced while eating can override homeostatic satiety signalling, it is now known that the current overabundant food context may lead children to overconsume palatable and energy-dense foods (Dalton & Finlayson, 2013; Stroebe, Papies, & Aarts, 2008). Thus, pleasure from eating may in some instances be a threat to children's healthy eating behaviours. Because of the overabundance of palatable energy-dense foods, pleasure from eating is highly likely to lead to overeating and to overweight (Booth, Pinkston, & Carlos Poston, 2005). Consequently, children are often encouraged by parents, caregivers, and national campaigns to develop self-control abilities to resist pleasure and avoid tempting foods (Schlam, Wilson, Shoda, Mischel, & Ayduk, 2013). However, pleasure from eating is much more complex than the innate appeal towards foods that are high in fat and sugar and could even be protective of healthy eating behaviours, under certain conditions that will be described in this review.

Frijda describes pleasure as “a ‘niceness gloss’ attached to its object” (Frijda, 2009). This definition implies that pleasure emerges from the interaction between an individual and an object. Yet, the interaction with a food object results in eating it. According to this definition, we will consider *pleasure from eating* as the pleasantness experienced while eating which is a multifaceted phenomenon that derives from multiple complementary sources. Pleasure from eating is assumed to be a strong driver of consumption both in terms of food-choice decision-making and in terms of the amount of food consumed (Drewnowski, 1997; Yeomans, Blundell, & Leshem, 2004). Generally, models of determinants of food consumption behaviour distinguish between three types of determinants: 1/properties of the food, 2/environmental factors, and 3/factors related to the person engaged in food consumption (Steenkamp, 1993). We assumed that the influence of these three types of determinants on eating behaviour might be at some point mediated by pleasure deriving specifically from each of them (i.e., pleasure from sensory sensations, pleasure from the social context of food consumption, or pleasure from cognitive representations of food) and we explored these three dimensions of pleasure from eating with a multidisciplinary approach. Each dimension may contribute to shape pleasure from eating but the assessment of pleasure may vary across dimensions. In the literature, several methods have been developed to assess pleasure from eating in children: physiological measures such as functional magnetic resonance imaging (fMRI) (Burger & Stice, 2012; Stice, Spoor, & Bohon, 2008), declarative measures such as liking scales and food preferences (Chen, Resurreccion, & Paguio, 1996; Guinard, 2001), or behavioural measures such as recording facial expressions, acceptance and intake (Berridge, 2000; Madrelle et al., 2017; Schwartz et al., 2009). Each type of measure has pros and cons and should be interpreted cautiously in terms of pleasure. Indeed, fMRI is useful to evaluate the intensity of hedonic response associated to a

food stimulus (Veldhuizen, Rudenga, & Small, 2010), but this particular context of food consumption is artificial and fails to integrate the social aspects of pleasure from eating. Using a liking scale, children are able to explicitly report pleasure deriving from a food (Birch, Zimmerman, & Hind, 1981; Hill, Wardle, & Cooke, 2009; Remy et al., 2014), but this measure does not take into account non-conscious pleasure mechanisms (Jacquier, Bonthoux, Baciú, & Ruffieux, 2012). Behavioural measures are indirect measures of pleasure from eating assuming that the behaviour observed is a consequence of pleasure from eating. If facial expressions and food acceptance are easily linkable to pleasure, intake is more controversial. In infants, as in animals, intake measurement for a particular food is classically considered as a liking indicator (Berridge, 1996). In later stages of life, the relationship between food choices or the amount of food consumed and the degree of pleasure elicited by this food is not so straightforward and may be modulated by individual attitudes toward food (Cantin & Dubé, 1999). Keeping in mind the limitations of each method, we did not exclude any experimental study from this review on the basis of the methodology used to assess pleasure from eating. The publications selected in this review aimed at illustrating the three dimensions of pleasure from eating previously described. We tried to specifically select experimental studies on children, but we also quoted experimental studies in adults and literature reviews notably to define theoretical concepts.

As young omnivores, children have to learn what, when, how, and how much to eat, in which context. In order to adapt to their culinary culture, children have behavioural predispositions that allow them to learn to like the foods made available to them (Nicklaus, 2015). In this perspective, pleasure may be an ally that helps children develop a healthy and culturally-adapted diet. Parents and caregivers play a major role in this learning process (for a review, see: Savage, Fisher, & Birch, 2007). Indeed, they participate in shaping children's food preferences by making some foods available rather than others (Cullen et al., 2003; Hearn et al., 1998; Kratt, Reynolds, & Shewchuk, 2000), and by acting as models of eating behaviours (Cullen et al., 2001; Young, Fors, & Hayes, 2004). Childhood is of particular interest for the study of eating behaviours because the early shaped preferences will remain stable until adulthood (for a review, see: Nicklaus & Remy, 2013). Moreover, the cultural context shapes attitudes towards food. For instance, it has been shown that pleasure and taste development are considered to be of primary importance at the age of complementary feeding by French mothers; in contrast, British mothers put an emphasis on health and nutrient qualities and not on the development of “palate” or “taste and flavour” (Caton, Ahern, & Hetherington, 2011; Schwartz et al., 2013). In adults, Rozin, Fischler, Imada, Sarubin, and Wrzesniewski (1999) observed that attitudes in France are more food pleasure-oriented and less food health-oriented than in the U.S.A., where foods are often viewed as a source of worry rather than of pleasure. Considering the lower prevalence of cardiovascular diseases in the French compared to American adults (Rosamond et al., 2008), as well as the lower prevalence of obesity in adults (Eschwège, Charles, & Basdevant, 2012; Flegal, Carroll, Ogden, & Curtin, 2010) and in children (Salanave, Castetbon, Péneau, Rolland-Cachera, & Hercberg, 2011; Skinner & Skelton, 2014), previous authors have emphasized that the importance of pleasure from eating and the minor role of health considerations could be protective in the context of healthy eating behaviours (Powell, Shima, Kazlauskaitė, & Appelhans, 2010; Rozin, 2005; Rozin et al., 1999; Saulais, Doyon, Ruffieux, & Kaiser, 2010). In line with this hypothesis, the question addressed in this review is: can learning pleasure from eating promote healthier eating behaviours in children?

As mentioned above, we identified three dimensions involved in

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