

<COMP: BRITISH SPELLING AND USAGE OK>

**<CT>Using food insecurity in health prevention to promote
consumer's embodied self-regulation**

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<C-AB>Abstract: Health messages designed to address obesity are typically focused on the long-term benefits of eating healthy food. However, according to the insurance hypothesis, obese people are food insecure, and this causes them to be overly concerned about short-term consumption. As such, it is necessary to rethink public health messaging and consider how to reduce short-term insecurity by eating healthy food.

While high-calorie foods are constantly available in contemporary environments, the evolutionary mismatch hypothesis suggests that people overconsume because their behaviour is optimized for the ancestral environment (e.g., McNamara et al. 2015; Nesse

& Williams 1995; Prentice & Jebb 1995). Consumers can satisfy their immediate needs by making choices between different foods. Considering this might help to explain why it is that health prevention messages are often focused on the long-term consequences of those choices. However, the recently developed insurance hypothesis by Nettle et al. leads to the suggestion that even in contemporary environments obese individuals may be living under the cloud of food insecurity. While this hypothesis is certainly not the only explanation for the distribution of obesity in the population, it does at least provide a new perspective for understanding food behaviour with a view to changing health communication.

Nettle et al. start by discussing the shortcomings of the literature, which suggests that “people who are obese or eat unhealthily place a high motivational value on getting food soon” (target article sect. 2; e.g., Guerrieri et al. 2012; Nederkoorn et al. 2006; Weller et al. 2008). According to the authors, this literature fails to describe the process(es) that lead(s) people to place a high motivational value on immediate consumption. According to Nettle et al., a plausible explanation for this is that obese people living under food insecurity would like to acquire food as soon as it becomes available. The insurance hypothesis might also help to explain why it is that obese people are more sensitive to the expected pleasure of high-calorie food consumption (Pursey et al. 2014; for a review, see Spence et al., 2016). Indeed, the expected pleasure is generally associated with the likely inflow of nutrients that is higher for high-calorie foods (de Graaf 2012; Herman & Polivy 1983; Redden & Haws 2013). Thus, the unhealthy = tasty intuition (UTI), which might lead people to make unhealthy food choices and which could in turn affect their body

mass index (BMI), could actually be attributable to the lack of nutritive expectations associated with healthy food consumption (Mai & Hoffmann 2015; Raghunathan et al. 2006). The UTI was initially tested on U.S.-American participants (Raghunathan et al. 2006). Interestingly, however, Werle et al. (2013) subsequently found that the French had a healthy = tasty intuition, due perhaps to their less utilitarian approach to eating (e.g., as compared to U.S.-Americans, see Rozin et al. 1999).

The nutritional aspect of consumption appears important for those individuals suffering from obesity. This interest can be justified by uncertainty in terms of acquiring nutritionally adequate foods in the future, as suggested by the insurance hypothesis. However, as pointed out by Block et al. (2011, p. 7): “No one sits down to eat a plate of nutrients.” Thus, promoting the sensory pleasure (rather than nutritional quality) of eating healthy food might constitute a better way in which to reduce both food insecurity and the overconsumption of high-calorie foods (Petit et al. 2016a). This strategy would also be in keeping with an embodied vision of self-regulation, according to which “being more conscious of one’s bodily states (and their simulation) in response to appetitive stimuli may be beneficial to pursuing healthy goals” (Petit et al. 2016b, p. 612). For instance, consumers should reduce their food intake with the decline in enjoyment (= an indication of replenishment) during consumption (de Graaf 2012; Herman & Polivy 1983; Redden & Haws 2013). Focusing their intention on the multisensory experiences (e.g., on the smell, taste, and mouthfeel of the food) while eating would inform the consumer’s brain of the likely inflow of nutrients, thus reducing both their food insecurity and their consumption (de Graaf 2012; Ramaekers et al. 2014). By contrast, when

consumers are more focused on health goals than on their physical sensations, they would be likely to make poor estimation of caloric content (Petit et al. 2016b). For instance, they are more sensitive to the health halo of fast-food restaurant health claims, leading to overconsumption to compensate for the underestimated nutritional intake (Chandon & Wansink 2007; Chernev & Gal 2010; Petit et al. 2016b).

The insurance hypothesis can also help to explain why it is that those individuals with a higher (vs. lower) BMI are better able to make healthy food choices and exhibit more activity in those brain areas that are associated with gustatory inference (insula), reward value (orbitofrontal cortex), and self-control (inferior frontal gyrus), when they are focused on the pleasure of eating them (vs. health benefits, see Petit et al. 2016a). Indeed, Petit and her colleagues explained their results by suggesting that people with a higher BMI are no less able to control themselves during healthy food choices than those with a lower BMI, but simply need a different valuation of those choices. By highlighting the pleasure (and thus nutrients) of eating healthy foods, public authorities and organizations in charge of promoting healthy lifestyles may be able to reduce food insecurity, and hence make healthy food choices more acceptable.

Recently, Petit et al. (in press) demonstrated that encouraging people to imagine the sensory experiences of eating a portion of food increases both the expected pleasure and the calorie estimation of smaller food portions, thus leading to a significant reduction of the portion size effect (i.e., generally, people tend to eat more when they are served a larger than a smaller portion of food). The fact that the calorie content of food portions is

often underestimated helps explain why it is that people with food insecurity would be likely to select larger food portions and thus overeat (Wansink & Chandon 2006).

Therefore, promoting the simulation of pleasant eating experiences would likely reduce the food insecurity highlighted by Nettle et al., by showing consumers that smaller food portions will satisfy their nutritional needs (Cornil & Chandon, 2016; Petit et al., in press).

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<RFT>**References** [Olivia Petit and Charles Spence] [OP]

<refs>

Block, L. G., Grier, S. A., Childers, T. L., Davis, B., Ebert, J. E., Kumanyika, S., Lacznia, R. N., Machin, J. E., Motley, C. M., Peracchio, L., Pettigrew, S., Scott, M., & van Ginkel Bieshaar, M. N. G. (2011) From nutrients to nurturance: A conceptual introduction to food well-being. *Journal of Public Policy & Marketing* 30(1):5–13. [OP]

Chandon, P. & Wansink, B. (2007) The biasing health halos of fast-food restaurant health claims: Lower calorie estimates and higher side-dish consumption intentions. *Journal of Consumer Research* 34(3):301–14. [OP]

Chernev, A. & Gal, D. (2010) Categorization effects in value judgments: Averaging bias in evaluating combinations of vices and virtues. *Journal of Marketing Research* 47:738–47. [OP]

- Cornil, Y. & Chandon, P. (2016) Pleasure as a substitute for size: How multisensory imagery can make people happier with smaller food portions. *Journal of Marketing Research*, 53(5):847–64. [OP]
- de Graaf, C. (2012) Texture and satiation: The role of oro-sensory exposure time. *Physiology & Behavior* 107(4):496–501. [OP]
- Guerrieri, R., Stanczyk, N., Nederkoorn, C. & Jansen, A. (2012) Reward-sensitive women overeat in a varied food environment, but only when hungry. *Eating Behaviors* 13(4):317–20. [OP]
- Herman, C. P. & Polivy, J. (1983) A boundary model for the regulation of eating. *Psychiatric Annals* 13(12):918–27. [OP]
- Mai, R. & Hoffmann, S. (2015) How to combat the unhealthy = tasty intuition: The influencing role of health consciousness. *Journal of Public Policy & Marketing* 34(1):63–83. [OP]
- McNamara, J. M., Houston, A. I. & Higginson, A. D. (2015) Costs of foraging predispose animals to obesity-related mortality when food is constantly abundant. *PLoS ONE* 10(11):e0141811. [OP]
- Nederkoorn, C., Braet, C., Van Eijs, Y., Tanghe, A. & Jansen, A. (2006) Why obese children cannot resist food: The role of impulsivity. *Eating Behaviors* 7(4):315–22. [OP]
- Nesse, R. M. & Williams, G. C. (1995) *Evolution and healing: The new science of Darwinian medicine*. Weidenfeld and Nicholson. [OP]

- Petit, O., Basso, F., Merunka, D., Spence, C., Cheok, A. D. & Oullier, O. (2016a)
Pleasure and the control of food intake: An embodied cognition approach to
consumer self-regulation. *Psychology & Marketing* 33(8):608–19. [OP]
- Petit, O., Merunka, D., Anton, J. L., Nazarian, B., Spence, C., Cheok, A. D., Raccach, D.
& Oullier, O. (2016b) Health and pleasure in consumers' dietary food choices:
Individual differences in the brain's value system. *PLoS ONE* 11(7): e0156333.
[OP]
- Petit, O., Spence, C., Velasco, C., Woods, A. & Cheok, A. D. (in press) Changing the
influence of portion size on consumer behavior via imagined consumption.
Journal of Business Research. [OP]
- Prentice, A. M. & Jebb, S. A. (1995) Obesity in Britain: Gluttony or sloth? *British
Medical Journal* 311(7002):437–39. [OP]
- Pursey, K. M., Stanwell, P., Callister, R. J., Brain, K., Collins, C. E. & Burrows, T. L.
(2014) Neural responses to visual food cues according to weight status: A
systematic review of functional magnetic resonance imaging studies. *Frontiers in
Nutrition* 1:7. [OP]
- Raghunathan, R., Naylor, R. W. & Hoyer, W. D. (2006) The unhealthy = tasty intuition
and its effects on taste inferences, enjoyment, and choice of food products.
Journal of Marketing 70(4):170–84. [OP]
- Ramaekers, M. G., Luning, P. A., Ruijschop, R. M., Lakemond, C. M., Bult, J. H., Gort,
G. & van Boekel, M. A. (2014) Aroma exposure time and aroma concentration in
relation to satiation. *British Journal of Nutrition* 111(3):554–62. [OP]

- Redden, J. P. & Haws, K. L. (2013) Healthy satiation: The role of decreasing desire in effective self-control. *Journal of Consumer Research* 39(5):1100–14. [OP]
- Rozin, P., Fischler, C., Imada, S., Sarubin, A. & Wrzesniewski, A. (1999) Attitudes to food and the role of food in life in the USA, Japan, Flemish Belgium and France: Possible implications for the diet–health debate. *Appetite* 33(2):163–80. [OP]
- Spence, C., Okajima, K., Cheok, A. D., Petit, O. & Michel, C. (2016) Eating with our eyes: From visual hunger to digital satiation. *Brain and Cognition*, 10:53-63. [OP]
- Wansink, B. & Chandon, P. (2006) Meal size, not body size, explains errors in estimating the calorie content of meals. *Annals of Internal Medicine* 145(5):326–32. [OP]
- Weller, R. E., Cook, E. W., Avsar, K. B. & Cox, J. E. (2008) Obese women show greater delay discounting than healthy-weight women. *Appetite* 51(3):563–69. [OP]
- Werle, C. O., Trendel, O. & Ardito, G. (2013) Unhealthy food is not tastier for everybody: The “healthy = tasty” French intuition. *Food Quality and Preference* 28(1):116–21. [OP]
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