

## Implicit attitudes, eating behavior, and the development of obesity

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### **Abstract:**

Nettle et al. describe increasing food intake (relative to energy expenditure) in response to food insecurity as a key contributor to obesity. I argue that a variety of implicit psychological mechanisms underlie this process to contribute to weight gain. The biobehavioral pathways and the social nature of food selection discussed here are importantly related to food selection and obesity.

**Keywords:** food insecurity | food selection | biobehavioral pathways | social pathways

### **Article:**

Human food selection and its relation to the global obesity epidemic is a complex, multifaceted problem. As Nettle et al. discuss, this complicated public health challenge requires multiple explanations. The authors present a compelling case for food insecurity as a contributor to weight gain and increases in obesity, but note the need for specification as to how this mechanism operates. Here, I argue that a variety of unconscious psychological mechanisms either underlie the relation between food insecurity and weight gain or co-occur as an independent contributor to obesity, in addition to the authors' model. A growing body of research in social and developmental psychology highlights that people's explicit preferences do not always match up with their implicit associations – attitudes that people may not even realize they hold (Greenwald & Banaji 1995). In the strongest case, such attitudes even reflect stereotypes with which a person actively disagrees. For example, even those who explicitly endorse egalitarian views and believe that people from all backgrounds are equally American implicitly endorse connections between social group membership and national identity (i.e., “American = White?” by Devos & Banaji 2005). These associations are importantly related to behavior, including discrimination in hiring, health care, and judicial decisions (Chapman et al. 2013; McConnell & Leibold 2001; Rachlinski et al. 2009; Rudman & Glick 2001). Similarly, a variety of implicit processes may underlie human eating behavior or illuminate why food insecurity and weight gain are related. Just as implicit social attitudes may differ from people's explicit beliefs about social groups and stereotypes, conscious food-related goals or preferences

may bear little resemblance to the unconscious mechanisms that influence what and how much people eat and the relation between food intake and weight gain.

For instance, living in chronically stressful environments alters regulation of the hypothalamic-pituitary-adrenal (HPA) axis. In turn, hormonal shifts are related to changes in appetite, preferences for comfort foods, and changes in metabolism that can contribute to weight gain (Knutson et al. 2007; Lumeng et al. 2014). These findings point to a complex biobehavioral network that affects not only what people choose to eat (e.g., a comforting food at the end of a stressful day), but also how the body processes those foods and signals the need to eat again by altering the balancing of appetite-inhibiting and appetite-signaling hormones. Chronically stressful environments, which are replete with psychosocial stress, are often also characterized by food insecurity. Therefore, weight gain in food-insecure environments may actually represent a complex network of stress-related reactions, in which food insecurity is just one symptom of a broader environment of stress. Additionally, some foods – specifically those that would contribute to weight gain and are readily available in high-income countries – may have addictive properties. In studies of rats, overconsumption of palatable high-fat foods triggered addiction-like behaviors and neural responses, and was not disrupted by conditioned electric shocks (Johnson & Kenny 2010). Foods that are similarly high in fat, sugar, and salt are readily available to humans, who demonstrate patterns of neural response to these food cues that are similar to neural circuitry observed in drug addiction (Gearhardt et al. 2011). In addition to an instinct to increase consumption when faced with food insecurity, the propensity to eat foods that contribute to weight gain is very difficult to overcome.

In addition to these biobehavioral pathways, eating is a highly social experience (Lieberman et al. 2016; Rozin 2005; Shutts et al. 2013). From an early age, food consumption and preferences are influenced by social input. Children eat more of foods that are labeled with socially relevant symbols, including familiar brands and characters (Roberto et al. 2010; Robinson et al. 2007). From infancy through adulthood, people eat more when surrounded by other people or when receiving positive social feedback from caregivers (Lumeng & Hillman 2007; Lumeng et al. 2007; Salvy et al. 2007; 2012). Additionally, social modeling influences food selection across the life span, as people tend to prefer the foods their peers and social in-group members eat (Birch 1980; Cruwys et al. 2015; Frazier et al. 2012; Hendy & Raudenbush 2000; Shutts et al. 2009; 2010). These contextual influences may unconsciously guide adults and children toward particular food choices, including eating more food than they would otherwise or selecting foods that contribute to weight gain, for reasons beyond their own preferences or goals.

The social and biobehavioral pathways outlined here suggest that unconscious psychological mechanisms alter human eating behavior, as well as the body's response to food in the absence of any changes in food intake. Food insecurity is an important indicator that an individual lives in a stressful environment. Along with social influences on food selection, these environments play an important role in food selection, weight gain, and the development of obesity. Finally, implicit in many studies of obesity is that individuals are to blame for their outcomes. When Nettle et al. use phrases such as “decision-making mechanisms” (e.g., sect. 1, para. 1) to describe human eating behavior, this language implies that their model characterizes a deliberate, conscious process. Obesity is highly stigmatized – obese and overweight individuals face discrimination and negative social consequences (Carr & Friedman 2005; Puhl & Brownell 2001; Schwartz et

al. 2003). In the case of childhood obesity, practice guidelines imply that parents are to blame not only for not adequately encouraging their children to eat healthy foods and avoid unhealthy foods, but also for improperly restricting their children's eating and pressuring their children to eat (Barlow 2007; Pesch et al. 2016). These issues highlight that people are often blamed for their own weight gain or their children's weight gain, despite the myriad unconscious processes that influence eating behavior and the body's response to food. To productively understand the development of obesity and effective prevention strategies, considering both conscious decisions *and* underlying psychological mechanisms is critical.

## References

Barlow, S. E. (2007) Expert committee recommendations regarding the prevention, assessment, and treatment of child and adolescent overweight and obesity: Summary report [10.1542/peds.2007-2329C]. *Pediatrics* **120**(Suppl. 4):S164. [CrossRef](#) | [Google Scholar](#)

Birch, L. L. (1980) Effects of peer models' food choices and eating behaviors on preschoolers' food preferences. *Child Development* **51**(2): 489–96. [Google Scholar](#)

Carr, D. & Friedman, M. A. (2005) Is obesity stigmatizing? Body weight, perceived discrimination, and psychological well-being in the United States. *Journal of Health and Social Behavior* **46**(3):244–59. [CrossRef](#) | [Google Scholar](#) | [PubMed](#)

Chapman, E. N., Kaatz, A. & Carnes, M. (2013) Physicians and implicit bias: How doctors may unwittingly perpetuate health care disparities. *Journal of General Internal Medicine* **28**(11):1504–10. [CrossRef](#) | [Google Scholar](#) | [PubMed](#)

Cruwys, T., Bevelander, K. E. & Hermans, R. C. J. (2015) Social modeling of eating: A review of when and why social influence affects food intake and choice. *Appetite* **86**:3–18. [CrossRef](#) | [Google Scholar](#)

Devos, T. & Banaji, M. R. (2005) American=White? *Journal of Personality and Social Psychology* **88**(3):447–66. [CrossRef](#) | [Google Scholar](#) | [PubMed](#)

Frazier, B. N., Gelman, S. A., Kaciroti, N., Russell, J. W. & Lumeng, J. C. (2012) I'll have what she's having: The impact of model characteristics on children's food choices. *Developmental Science* **15**(1):87–98. [CrossRef](#) | [Google Scholar](#) | [PubMed](#)

Gearhardt, A. N., Grilo, C. M., DiLeone, R. J., Brownell, K. D. & Potenza, M. N. (2011) Can food be addictive? Public health and policy implications. *Addiction* **106**(7):1208–12. [CrossRef](#) | [Google Scholar](#) | [PubMed](#)

Greenwald, A. G. & Banaji, M. R. (1995) Implicit social cognition: Attitudes, self-esteem, and stereotypes. *Psychological Review* **102**(1):4–27. [CrossRef](#) | [Google Scholar](#) | [PubMed](#)

Hendy, H. & Raudenbush, B. (2000) Effectiveness of teacher modeling to encourage food acceptance in preschool children. *Appetite* **34**(1):61–76. [CrossRef](#) | [Google Scholar](#) | [PubMed](#)

- Johnson, P. M. & Kenny, P. J. (2010) Dopamine D2 receptors in addiction-like reward dysfunction and compulsive eating in obese rats [10.1038/nn.2519]. *Nature Neuroscience* **13**(5):635–41. [CrossRef](#) | [Google Scholar](#)
- Knutson, K. L., Spiegel, K., Penev, P. & Van Cauter, E. (2007) The metabolic consequences of sleep deprivation. *Sleep Medicine Reviews* **11**(3):163–78. [CrossRef](#) | [Google Scholar](#) | [PubMed](#)
- Lieberman, Z., Woodward, A. L., Sullivan, K. R. & Kinzler, K. D. (2016) Early emerging system for reasoning about the social nature of food. *Proceedings of the National Academy of Sciences of the United States of America* **113**(34):9480–85. [CrossRef](#) | [Google Scholar](#) | [PubMed](#)
- Lumeng, J. C. & Hillman, K. H. (2007) Eating in larger groups increases food consumption. *Archives of Disease in Childhood* **92**(5):384–87. [CrossRef](#) | [Google Scholar](#) | [PubMed](#)
- Lumeng, J. C., Miller, A., Peterson, K. E., Kaciroti, N., Sturza, J., Rosenblum, K. & Vazquez, D. M. (2014) Diurnal cortisol pattern, eating behaviors and overweight in low-income preschool-aged children. *Appetite* **73**:65–72. [CrossRef](#) | [Google Scholar](#) | [PubMed](#)
- Lumeng, J. C., Patil, N. & Blass, E. M. (2007) Social influences on formula intake via suckling in 7 to 14-week-old-infants. *Developmental Psychobiology* **49**(4):351–61. [CrossRef](#) | [Google Scholar](#) | [PubMed](#)
- McConnell, A. R. & Leibold, J. M. (2001) Relations among the Implicit Association Test, discriminatory behavior, and explicit measures of racial attitudes. *Journal of Experimental Social Psychology* **37**(5):435–42. [CrossRef](#) | [Google Scholar](#)
- Pesch, M. H., Appugliese, D. P., Kaciroti, N., Rosenblum, K. L., Miller, A. L. & Lumeng, J. C. (2016) Maternal encouragement and discouragement: Differences by food type and child weight status. *Appetite* **101**:15–22. [CrossRef](#) | [Google Scholar](#) | [PubMed](#)
- Puhl, R. & Brownell, K. D. (2001) Bias, discrimination, and obesity. *Obesity Research* **9**(12):788–805. [CrossRef](#) | [Google Scholar](#) | [PubMed](#)
- Rachlinski, J. J., Johnson, S. L., Wistrich, A. J. & Guthrie, C. (2009) Does unconscious racial bias affect trial judges? *Notre Dame Law Review* **84**(3):1195–246. [Google Scholar](#)
- Roberto, C. A., Baik, J., Harris, J. L. & Brownell, K. D. (2010) Influence of licensed characters on children's taste and snack preferences. *Pediatrics* **126**(1):88–93. [CrossRef](#) | [Google Scholar](#) | [PubMed](#)
- Robinson, T. N., Borzekowski, D. L., Matheson, D. M. & Kraemer, H. C. (2007) Effects of fast food branding on young children's taste preferences. *Archives of Pediatrics & Adolescent Medicine* **161**(8):792–97. [CrossRef](#) | [Google Scholar](#)

Rozin, P. (2005) The meaning of food in our lives: A cross-cultural perspective on eating and well-being. *Journal of Nutrition Education and Behavior* **37**:S107–112. [CrossRef](#) | [Google Scholar](#) | [PubMed](#)

Rudman, L. A. & Glick, P. (2001) Prescriptive gender stereotypes and backlash toward agentic women. *Journal of Social Issues* **57**(4):743–62. [CrossRef](#) | [Google Scholar](#)

Salvy, S.-J., De La Haye, K., Bowker, J. C. & Hermans, R. C. J. (2012) Influence of peers and friends on children's and adolescents' eating and activity behaviors. *Physiology & Behavior* **106**(3):369–78. [CrossRef](#) | [Google Scholar](#) | [PubMed](#)

Salvy, S.-J., Jarrin, D., Paluch, R., Irfan, N. & Pliner, P. (2007) Effects of social influence on eating in couples, friends and strangers. *Appetite* **49**(1):92–99. [CrossRef](#) | [Google Scholar](#) | [PubMed](#)

Schwartz, M. B., Chambliss, H. O. N., Brownell, K. D., Blair, S. N. & Billington, C. (2003) Weight bias among health professionals specializing in obesity. *Obesity Research* **11**(9):1033–39. [CrossRef](#) | [Google Scholar](#) | [PubMed](#)

Shutts, K., Banaji, M. R. & Spelke, E. S. (2010) Social categories guide young children's preferences for novel objects. *Developmental Science* **13**(4):599–610. [CrossRef](#) | [Google Scholar](#) | [PubMed](#)

Shutts, K., Kinzler, K. D. & DeJesus, J. M. (2013) Understanding infants' and children's social learning about foods: Previous research and new prospects. *Developmental Psychology* **49**(3):419–25. [CrossRef](#) | [Google Scholar](#) | [PubMed](#)

Shutts, K., Kinzler, K. D., McKee, C. B. & Spelke, E. S. (2009) Social information guides infants' selection of foods. *Journal of Cognition and Development* **10**(1–2):1–17. [CrossRef](#) | [Google Scholar](#) | [PubMed](#)