

**BBS-D-16-00521\_ Nettle\_ Mata et al.**

**<CT>Social nature of eating could explain missing link between  
food insecurity and childhood obesity**

**<CA>Jutta Mata,<sup>a,b</sup> Mattea Dallacker,<sup>b</sup> and Ralph Hertwig<sup>b</sup>**

**<CAA><sup>a</sup>Health Psychology, Department of Social Sciences, University of  
Mannheim, 68161 Mannheim, Germany; <sup>b</sup>Max Planck Institute for Human  
Development, 14195 Berlin, Germany.**

**mata@uni-mannheim.de**

**dallacker@mpib-berlin.mpg.de**

**hertwig@mpib-berlin.mpg.de**

**<http://gesundheitspsychologie.uni-mannheim.de/english/Home/>**

**<https://www.mpib-berlin.mpg.de/en/staff/mattea-dallacker>**

**<https://www.mpib-berlin.mpg.de/en/staff/ralph-hertwig>**

**<C-AB>Abstract:** We suggest that social factors are key to explain the missing link between food insecurity and obesity in children. Parents and public institutions are children's nutritional gatekeepers. They protect children from food insecurity by trimming down their consumption or by institutional support. To gauge children's food insecurity, evaluations across the different nutritional gatekeepers need to be integrated.

**<C-Text begins>**

The insurance hypothesis offers an intriguing environment-based account of the global obesity crisis. Considering the mismatch between ancestral food scarcity and the unprecedented energy-density of contemporary food environments, it attributes socioeconomic differences in obesity to an evolved adaptive mechanism. Specifically, individuals are hypothesized to store more fat when cues indicate that access to food is uncertain, thus buffering against future shortages. The authors acknowledge the multicausality of obesity, with no single factor explaining all or most of the variance. Against this background, they also consider the role of genes and psychological factors such as impulsivity and inhibition in explaining the complex phenomenon of obesity. However, one important factor is missing from their account: the role of others, namely, nutritional gatekeepers.

Although Nettle et al. emphasize the role of society in explaining obesity, they depict food choice – perhaps the single most important behavioral act associated with obesity or lack thereof – as an individualistic decision. They thus overlook social dimensions that are crucial in explaining some of the perplexing patterns surrounding obesity. Eating is not a solitary intake of energy but often a social activity shaped by others' dietary behavior and choices (Herman et al. 2003). “Company” literally means “with bread” – company is those with whom we break bread. Few, if any, health-related behaviors are as closely embedded in the social context as eating – especially where children are concerned. By the age of 10, a child has eaten about 10,000 meals, most of them in the company of their family. Yet, children rarely enjoy autonomy in their food choices.

Nutritional gatekeepers – not only parents and grandparents, but also institutions (e.g., kindergartens, schools, policymakers) determine the food choice architecture. One of the most important food contexts for children is the family, with nutritional gatekeepers determining more than 70% of what the family eats (Wansink 2006) through, for example, their economic resources (Keane et al. 2012), family mealtime practices (Dallacker et al. 2016a), nutritional knowledge, and numerical abilities, which are associated with comprehension of nutrition labels or portion size estimation skills (Dallacker et al. 2016b; Mata et al. 2008).

Why do the authors not find a relationship between food insurance and obesity in children? We suggest that recognizing the social nature of eating – and, in particular, of children’s food choices – can offer answers for this missing link. Not all participants in the shared activity of eating (e.g., Sobal & Nelson 2003) will be equally affected by (perceived) food insecurity. Despite eating at the same table, the last-born child is often less well-nourished than the first-born. For example, in a family of seven, the height for age of the last-born child is up to 2.5 standard deviations less than that of the first-born (Hertwig et al. 2002). Yet ethical norms and legal policies aim to protect children from malnutrition or starvation. For example, mothers report abstaining from food to ensure that their children are adequately nourished (McIntyre et al. 2003; Piperata et al. 2013). In wealthy societies, institutional settings such as daycare centers and schools often provide free lunches or free milk to children from impoverished families. In the United States, for example, 16 different food assistance programs were funded in 2002, and one in five Americans participated in them at one point during that year (Fox et al. 2004).

Thus, relatively rich societies aim to protect children from the detrimental effects of food insecurity through social norms, welfare assistance, and institutionalized arrangements. Admittedly, despite these efforts, even high-income countries appear to suffer from “hidden hunger” and malnutrition caused by vitamin and mineral deficiencies that threaten to impair children’s intellectual and physical development (Biesalski & Black 2016).

The authors suggest a methodological explanation for the missing link between food insecurity and body mass index: The studies included in the meta-analysis measured a child’s food insecurity through parental reports, which are likely to differ from the child’s perception (Connell et al. 2005; Fram et al. 2011). Importantly, this is not only a methodological, but, again, also a social explanation. As described above, wealthy societies aim to protect children from hunger and food poverty both within the family and beyond (Fox et al. 2004). As a consequence of the multiple individual and institutional nutritional gatekeepers involved in children’s nutrition, parental perceptions – being just one piece of the social puzzle – may not be a veridical and integrative proxy of a child’s food (in-)security – even more so when parents equate food security with lack of hunger and thus neglect the risk of malnutrition.

To conclude, eating was, has been, and will likely continue to be a shared activity – not always, but often. Any comprehensive model of obesity therefore needs to account for the social nature of food choice and consumption. This is particularly the case for children, whose food choice autonomy is restricted. The authors did not find a link

between food insecurity and children's obesity. The reason could be that this link simply does not exist or is relatively weak because parents, institutions, and policymakers buffer children from food insecurity. Alternatively, a link may exist, but it may be moderated by who is competent to gauge children's experience of food security or lack thereof: the children, their parents, institutional settings, policymakers? A stringent test of the food insecurity hypothesis in children demands that proper attention be paid to the social dynamics of food choice and eating.

<C-Text ends>

**[COMP: DO NOT SET REFERENCES FROM HERE; USE CONSOLIDATED REFERENCES FILE. PROOFREADER: NOTE THAT THESE REFERENCES MAY NOT BE IN THEIR FINAL FORM; REFER TO CONSOLIDATED REFS.]**

<RFT>**References** [Jutta Mata, Mattea Dallacker, and Ralph Hertwig] [JM]

<refs>

Biesalski, H. K. & Black, R. E. (2016) *Hidden hunger: Malnutrition and the first 1000 days of life: Causes, consequences and solutions*. Karger. [JM]

Connell, C. L., Lofton, K. L., Yadrick, K. & Rehner, T. A. (2005) Children's experiences of food insecurity can assist in understanding its effect on their well-being. *Journal of Nutrition* 135:1683–90. [JM]

Dallacker, M., Hertwig, R. & Mata, J. (2016a) More than just food: A meta-analysis of family mealtime practices associated with children's nutritional health. *Manuscript under review*. [JM]

Dallacker, M., Hertwig, R., Peters, E. & Mata, J. (2016b) Lower parental numeracy is associated with children being under- and overweight. *Social Science & Medicine* 161:126–33. doi: 10.1016/j.socscimed.2016.06.006. [JM]

- Fox, M. K., Hamilton, W. & Lin, B.-H. (2004) *Effects of food assistance and nutrition programs on nutrition and health: Volume 4. Executive summary of the literature review* (Electronic Publications from the Food Assistance & Nutrition Research Program No. FANR-19-4).  
[http://www.ers.usda.gov/webdocs/publications/fanrr194/30211\\_fanrr19-4a\\_002.pdf](http://www.ers.usda.gov/webdocs/publications/fanrr194/30211_fanrr19-4a_002.pdf). [JM]
- Fram, M. S., Frongillo, E. A., Jones, S. J., Williams, R. C., Burke, M. P., DeLoach, K. P. & Blake, C. E. (2011) Children are aware of food insecurity and take responsibility for managing food resources. *Journal of Nutrition* 141:1114–19. doi:10.3945/jn.110.135988. [JM]
- Herman, C. P., Polivy, J. & Roth, D. A. (2003) Effects of others on food intake: A normative interpretation. *Psychological Bulletin* 129:873–86. doi: 10.1037/0033-2909.129.6.873. [JM]
- Hertwig, R., Davis, J. N. & Sulloway, F. J. (2002) Parental investment: How an equity motive can produce inequality. *Psychological Bulletin* 128:728–45. doi: 10.1037/0033-2909.128.5.728. [JM]
- Keane, E., Layte, R., Harrington, J., Kearney, P. M. & Parry, I. J. (2012) Measured parental weight status and familial socio-economic status correlates with childhood overweight and obesity at age 9. *PLOS One* 7:e43503. doi: 10.1371/journal.pone.0043503. [JM]
- Mata, J., Scheibehenne, B. & Todd, P. M. (2008) Predicting children's meal preferences: How much do parents know? *Appetite* 50:367–75. doi: 10.1016/j.appet.2007.09.001. [JM]

McIntyre, L., Glanville, N. T., Raine, K. D., Dayle, J. B., Anderson, B. & Battaglia, N.

(2003) Do low-income lone mothers compromise their nutrition to feed their children? *Canadian Medical Association Journal* 168:686–91. [JM]

Piperata, B. A., Schmeer, K. K., Hadley, C. & Ritchie-Ewing, G. (2013) Dietary inequalities of mother–child pairs in the rural Amazon: Evidence of maternal–child buffering? *Social Science & Medicine* 96:183–91. doi:

10.1016/j.socscimed.2013.07.024. [JM]

Sobal, J. & Nelson, M. K. (2003) Commensal eating patterns: A community study.

*Appetite* 41:181–90. doi: 10.1016/S0195-6663(03)00078-3. [JM]

Wansink, B. (2006) Nutritional gatekeepers and the 72% solution. *Journal of the American Dietetic Association* 106:1324–27. doi: 10.1016/j.jada.2006.07.023.

[JM]

<Refs end>