

Edward A. Frongillo

Department of Health  
Promotion, Education, and  
Behavior, University of South  
Carolina, Columbia, U.S.A.  
EFRONGIL@mailbox.sc.edu

### Confronting myths about household food insecurity and excess weight

The article of Schlüssel et al. makes a valuable contribution by clarifying how household food insecurity (HFI) is differentially associated with obesity over the life course in females. Although HFI was not associated with obesity in Brazilian children, it was associated in female adolescents and adults. Further research to reveal why HFI is differentially associated with obesity across the life course would be helpful in understanding how best to prevent obesity in food-insecure households.

The association between HFI and obesity has been discussed since at least 1995, and this association has been labeled a “paradox”. This label resulted from the limited knowledge in the 1990s of the causes, mechanisms, and consequences of HFI. The prevailing conceptual framework for HFI then was that poverty could result in HFI, which in turn leads to poor dietary quality and quantity, undernutrition, and poor health<sup>1</sup>. Since the 1990s, however, there has been an extensive gain in knowledge about HFI that has led to the development of a more sophisticated and accurate conceptual framework for HFI<sup>1</sup>. This extensive gain in knowledge about HFI has resulted from several in-depth qualitative studies and many quantitative studies made possible by the existence of questionnaire-based measures of HFI such as used by Schlüssel et al. The persistence of the label “paradox” today reflects lack of recognition of this extensive gain in knowledge about HFI, and adherence to the myth (in the anthropological meaning of shared belief) that poverty and HFI should lead to undernutrition (and not obesity).

HFI is experienced when there is uncertainty about future food availability and access, insufficiency in the amount and kind of food required for a healthy lifestyle, or the need to use socially unacceptable ways to acquire food<sup>1</sup>. Hunger and malnutrition (i.e., undernutrition or obesity) are potential, although not necessary, consequences of HFI. Other closely linked consequences of HFI are part of the experience of food insecurity: (1) worry and anxiety, (2) feelings of alienation and deprivation, and (3) distress and adverse changes in family and social interactions. These three closely linked consequences of HFI represent non-nutritional pathways or mechanisms that lead to poor physical and mental health<sup>1</sup>. For example, HFI in Burkina Faso is closely linked with concern, worries, and anxiety that ultimately

lead to weight and sleep loss; feelings of alienation (e.g., shame) and deprivation (e.g., guilt); and alteration in household cohesion leading to disputes and difficulties keeping children at home<sup>2</sup>. Furthermore, because HFI is a form of deprivation, both the conditions and feelings of deprivation are relevant to HFI and behavior resulting from it. Some behaviors potentially resulting from experiences of food insecurity are reductions in investments (e.g., in productive assets, education, and children), risk avoidance (e.g., regarding adoption of new agricultural technologies or management practices), and survival strategies (e.g., rural-urban migration, diversification of livelihood strategies)<sup>3</sup>. Food needs compete with other needs, and trade-offs involving food are sometimes made to ensure long-term livelihood. Thus, there are many potential mechanisms through which HFI may lead to obesity in some subpopulations and at some ages.

The myth that poverty and HFI leads to undernutrition (and not obesity) is strongly held, and comes with sociological and political overtones regarding the reasons why people live in poor conditions. Poverty and HFI are forms of material deprivation, which conjures images of lack of food, starvation, and weight deficit. Severe HFI leads to weight deficit<sup>3,4</sup>, but moderate HFI in some contexts leads to weight excess<sup>4</sup>. The latter was observed in Brazilian women. Since material deprivation leads to bad outcomes across a multitude of domains, that one of these domains is excess weight should be expected rather than surprising.

Schüssel et al. refer to another strongly held myth that parents protect children and adolescents from HFI. Recent in-depth qualitative studies in the U.S.<sup>5</sup> and Venezuela<sup>6</sup> have shown that children and adolescents have unique experiences of HFI. Children and adolescents experience cognitive, emotional, and physical awareness of HFI, and take responsibility for HFI by participating in parental actions, initiating their own actions, and generating resources for the household<sup>5,6</sup>. Parents do not always have knowledge of the experiences of children and adolescents because of lack of communication and efforts by household members to protect each other. There are strong social expectations about the roles that fathers and mothers each should have in protecting each other and their offspring. As expected, fathers and mothers reported in interviews that they protected their partner and offspring from HFI. Interviews also revealed that children and adolescents protect younger siblings and parents. For these reasons, HFI may be experienced differently by different individuals within house-

holds (potentially resulting in both underweight and excess weight), but it should not be assumed that children and adolescents are protected from experiencing HFI and its effects.

The concept of HFI has proven to be valuable in capturing non-economic or non-income aspects of material deprivation. HFI is complex because of its multiple components, its universal but also unique aspects across contexts<sup>7</sup>, the differential experiences of and effects on household members, and its differential effects across the life course. The myths that the association of HFI and obesity is a “paradox” and that children and adolescents are protected from HFI by parents should be replaced by the new understandings that have come from qualitative and quantitative research such as Schlüssel et al. Obesity is an expected consequence of HFI for some subpopulations and at some ages, and children and adolescents are often affected by HFI through nutritional and/or non-nutritional pathways despite parental intentions or beliefs otherwise.

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David A.  
Himmelgreen

Department of Anthropology,  
University of South Florida,  
Tampa, U.S.A.  
dhimmelg@usf.edu

### Using a life course approach and a bio-cultural perspective to understand the food insecurity and obesity paradox

Using cross-sectional data from the 2006 Brazilian Demographic and Health Survey (DHS), Schlüssel et al. examine the association between household food insecurity (HFI) and excess body weight/obesity among adult women, female adolescents, and children under five. Their results suggest that the nature of the relationship is a function of the life course stage. Historically, HFI has been associated with undernutrition in children and adults (females in particular), especially in poorer countries where adequate nutrition, sanitation, and healthcare are in short supply. More recently however, the paradoxical situation of HFI and overweight and obesity has been demonstrated in high-income, middle-income, and in ascending- or transitional-income countries. In addition to the life course stage, what is particularly interesting about this paradox is that the strength of the relationship between food security status and excess body weight is also influenced by environmental conditions and that there is a synergistic relationship between human biology and culture and behaviors.

In this paper, while the positive association between HFI and child obesity is not statistically significant, food-insecure adolescent females are about two times more likely to have excess weight when compared to their food-secure counterparts. The likelihood of excess weight is nearly 1.5 times higher among food-insecure adult females than among food-secure women. On one hand, adult females with moderate food insecurity are at a 49% higher risk of being obese than their food-secure counterparts. On the other hand, the risk of excess weight among adolescent females is significantly higher for those with severe HFI (rather than moderate HFI) when compared to their food-secure counterparts.

The authors suggest that the differences in excess weight gain/obesity by severity of food insecurity between adult women and adolescent females reflect that the latter are resistant to fat accumulation because of the physiological changes associated with puberty (e.g., adolescent growth spurt which requires additional energy for increases in skeletal dimensions and developmental changes associated with reproductive maturation). Additionally, the authors point to cultural practices and behavior related to body image and ideal body types as a possible mechanism to explain the difference in