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Future Research Directions for the Insurance Hypothesis regarding Food Insecurity and Obesity

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Abstract

This commentary discusses Nettle et al.'s "The Insurance Hypothesis" linking food insecurity to a high body mass index (BMI). Discussion about how the relationship between race/ethnicity and obesity in the United States is consistent with this hypothesis is presented. Potential ways forward to elucidate the validity of this hypothesis in humans through rigorous controlled trials is highlighted.

Nettle, Andrews, and Bateson note that "high levels of stored reserves ought to be found not amongst those whose access to food is assured, but exactly amongst those whose access to food is insecure." We agree with this, and commend the thorough analysis and discussion presented in this manuscript that builds on similar concepts presented previously (as the "Economic Insecurity Hypothesis" (Smith, Stoddard, & Barnes, 2007), "Resource Scarcity Hypothesis" (Dhurandhar, 2016) and others (Kaiser, Smith, & Allison, 2012)). Herein, we extend the discussion of the Insurance Hypothesis in two areas given little or no attention by Nettle et al.: 1) the relationship between food insecurity and obesity among racial and ethnic minorities in the US and abroad; and 2) the role of randomized studies to test the hypothesis in humans.

First, patterns of poverty and food insecurity, which disproportionately affect racial and ethnic minorities in the US and abroad, yield results consistent with the Insurance Hypothesis. In 2015, 24.1 percent of blacks and 21.4 percent of Hispanics were in poverty, compared to 10.1 percent of non-Hispanic whites (US Census Bureau, 2016). Correspondingly, food insecurity is higher in racial and ethnic minority populations (Coleman-Jensen, Gregory, & Singh, 2014; Nord, Andrews, & Carlson, 2005). In 2013, an estimated 10.6 percent of non-Hispanic white households were food insecure compared with 26.1 percent of black households and 23.7 percent of Hispanic households, respectively. In

line with the Insurance Hypothesis, rates of obesity are significantly higher in most racial and ethnic minority groups, though exceptions exist: the estimated prevalence of obesity among Asians (10.8%) is one-third that of non-Hispanic whites (32.6%) (Ogden, Carroll, Kit, & Flegal, 2014). This exception does not contradict the Insurance Hypothesis: 2015 median income among US Asian families was 18% higher than non-Hispanic white households (US Census Bureau, 2015). The authors also cite the well documented existence of heavier body ideals in subsistence populations (Anderson, Crawford, Nadeau, & Lindberg, 1992; Tovée, Swami, Furnham, & Mangalparsad, 2006; Wetsman & Marlowe, 1999), suggesting cultural adaptations that complement individual behavioral responses to energetic uncertainty. Similarly, body weight ideals are higher in blacks and Hispanics relative to the ideals of thinness reported in non-Hispanic white counterparts (Bennett & Wolin, 2006; Chang & Christakis, 2003). While a multitude of factors contribute to racial and ethnic disparities observed in the US and abroad, the Insurance Hypothesis suggests an additional contributing factor—energetic uncertainty and adaptations made in response to perceived food insecurity.

Given the complex etiology of human obesity, we wish to emphasize the value of randomized-controlled studies in testing the Insurance Hypothesis and isolating perceived energetic uncertainty as a contributing factor. While the authors argue that “the stronger ‘doubly longitudinal’ approach...comes as close to the experimental approaches used in birds as is possible with human participants”, we are aware of several published studies which have experimentally manipulated some aspect of social status, a potential contributor to energetic uncertainty, in human populations and tested subsequent obesity-related eating behavior. Both found experimentally induced lower social status in humans caused consumption of a significantly greater percent of daily calorie needs (Cardel et al., 2016) or total calories consumed (Bratanova, Loughnan, Klein, Claassen, & Wood, 2016). The “Moving to Opportunity Study” was a randomized social experiment with a voucher-based intervention that allowed the intervention group to move to a nicer neighborhood, and this intervention was sufficient to reduce mean BMI compared to the control group that received a traditional voucher (Ludwig et al., 2011). Further, the consumption of foods believed to be high in calories was higher in participants primed to the concept of environmental harshness (Laran & Salerno, 2013). While the above studies are clearly related to the Insurance Hypothesis, neither was a pure operationalization of energetic uncertainty. We believe that other cues of food insecurity, or food insecurity itself, could be manipulated and tested for their effect on food selection and eating behavior, and future research should strive to operationalize perceived energetic uncertainty such that it offers a more direct test of the Insurance Hypothesis.

Based on recent findings in human nutrition and obesity research, it’s clear that simply providing access to more resources and/or education alone is not enough to attenuate the effect of food insecurity on the development of obesity. In some cases, the provision of financial resources, which *presumably* reduce food insecurity have led to weight gain (Leroy, 2016), particularly in individuals who were already overweight or obese. Additional research should identify the predictors of perceived food *security*, whether the experimental manipulation of these and other factors improves one’s sense of control over perceived access to their food supply (e.g., gardening, financial planning, budget-focused dietary

interventions; Dhurandhar, 2016), and their potential value to a population-level intervention strategy for obesity related to food insecurity in the “obesogenic” land of plenty in which high income countries reside.

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