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Childhood income dynamics and adult adiposity

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Abstract: Conventional wisdom--reflected in literature reviews as well as newspaper and magazine stories--holds that poor children are at risk for developing obesity and that there is a negative gradient between income and body mass. This wisdom is reflected in programs and interventions targeting the nutrition and exercise habits of poor children. In fact, there appears to be far more literature discussing mechanisms for these relationships, from relative food prices to access to parks to epigenetic programming, than literature supporting a causal effect of childhood economic resources on later body mass.

This project set out to investigate what it is about income in childhood that is related to later excess body fat. I investigated different poverty definitions (demonstrating a methodology for empirically deriving optimal poverty thresholds), the marginal effect of more income within small ranges of income (in semi-parametric models), and instability of income net of permanent childhood income. I analyzed these putative causal factors via models for moving beyond crude measures whereby a single indicator of economic circumstances at some unspecified point in childhood stands in for all childhood experiences. The aim was to isolate what aspect of childhood income at what point in childhood accounts for the apparent effect of relative economic deprivation on body mass. Fixed effects models would show that the total effect of childhood economic conditions was robust to unobserved heterogeneity.

Where I find effects consistent with the conventional wisdom, they tend to be small. Testing five poverty definitions across five models of childhood poverty dynamics, the largest single effect is for spending all of one's childhood below either 185% or 200% of the federal poverty level, versus never being poor under these definitions, accounting for a 2.4% higher body mass index (BMI) in adulthood. For a baseline BMI of 20 (30), this implies a new BMI of 20.5 (30.7). The best fitting model suggests that spending all of early childhood (the birth year through the year the child turns 5) and all of middle childhood (6 to 11) but none of adolescence below 185% of the usual poverty line produces a BMI around 3.8% higher, moving from 20 (30) to 20.8 (31.1). Modeling the marginal effect of all childhood income from 0 to 750% of the poverty line suggests a reduction in BMI of 3 points over this range for white women, and nearly 3 points for African American females over the same income range in middle childhood. Moving over the entire possible range of income instability in early childhood accounts for a BMI around 3.8% higher. These results are not consistent, however: Higher income (up to 750% of poverty) is associated with higher BMIs for African American males and generally little difference for white males and Hispanics, and fixed effects models suggest only protective effects—lower adult BMI—of more of childhood spent in poverty or experiencing income declines in childhood. Furthermore, the fixed effects models suggest that, controlling for income instability and other factors, higher childhood permanent income is associated with higher adult BMI, the opposite of the conventional wisdom. People react to given economic conditions in different ways, depending upon family and cultural norms, the availability of consumption-smoothing resources such as wealth or family support, community resilience factors, etc. Individual differences in stress perception and coping skills will further moderate the health effects of what appear to be otherwise equivalently stressful situations. While much attention has been paid to the obesity risk associated with low income, and some to the risk attendant to income instability, this analysis suggests any long-term effects of childhood income dynamics are small at best. This does not necessarily conflict with research that shows within-childhood effects of income or poverty on obesity risk, or research that provides causal evidence of the adiposity contributions of income dynamics within adulthood. It does suggest that there is a disconnect, that moderators occurring after childhood will nearly as often make the well off large and the poor slender as what
the conventional wisdom might dictate.