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Academic Performance and Childhood Misnourishment: A Quantile Approach

Kristen Capogrossi

Department of Agricultural and Applied Economics, Virginia Tech

Wen You

Department of Agricultural and Applied Economics, Virginia Tech

*Poster prepared for presentation at the Agricultural & Applied Economics Association's 2011
AAEA & NAREA Joint Annual Meeting, Pittsburgh, Pennsylvania, July 24-26, 2011*

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Kristen Capogrossi and Wen You
Department of Agricultural and Applied Economics



INTRODUCTION

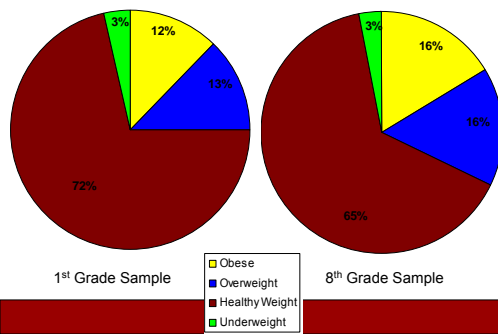
- Childhood misnourishment:
 - Caused by insufficient dietary and nutritional quality
 - Includes overweight, obese and underweight
- United States estimates:
 - 190+ million overweight children
 - 2.4 million underweight children
- Childhood misnourishment brings serious health consequences:
 - Chronic diseases
 - Weaken immune system → more frequent and worse infections
- Does weight affect cognitive development?
 - Mixed results are found on correlations between misnourishment and academic performance

RESEARCH QUESTIONS

- Does weight status impact academic performance?
- Are impacts of weight larger on lower performing students?
- Do inequalities in academic performance between misnourished students and healthy weight students increase over time?

DATA

- Early Childhood Longitudinal Study-Kindergarten Class
- Nationally representative sample of 21,260 children followed from kindergarten (1998-1999) to 8th grade
- Information on children, parents, teachers and schools
- Standardized math and reading scores which can be compared among children and over time
- Staff measured weight and height of the students



ANALYSIS APPROACH

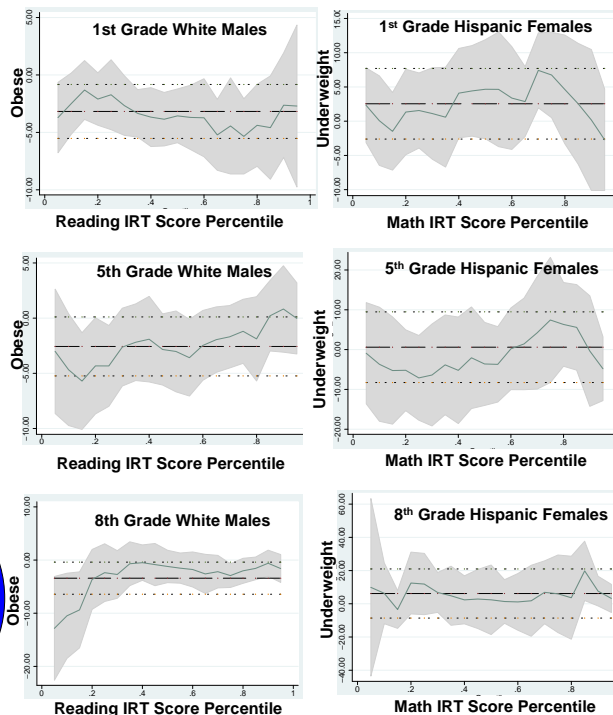
Endogeneity

- Simultaneity between health and cognitive production functions
- Example: if poor parenting contributes to child weight and poor academic performance rather than weight causing poor performance
- Need instruments that influence performance only through weight:
 - Child's past weight;
 - Health insurance status;
 - Number of breakfasts and dinners eaten as a family
 - Parental occupation variables (e.g., current employment status)

Instrumental Variable Quantile Regression (IVQR)

- Quantile regression:
 - get an overall picture of covariate effects
 - allow examination of the tails of the distribution
- IVQR (Chernozhukov and Hansen, 2005)
 - allows and corrects for multiple continuous or dichotomous endogenous variables
 - measures of child weight (endogenous variable):
 - BMI percentile-for-age
 - BMI z-score
 - dichotomous weight classification

RESULTS



SUMMARY OF FINDINGS

- Overall Findings:
 - Weight has significant negative impacts on performance depending on race and gender with underweight having the smallest impact
 - Heterogeneous relationship between obesity/underweight and academic performance varies across distribution
 - Weight tends to affect math scores more than reading scores
- Detailed Findings:
 - Being obese has an increasingly negative impact on math scores of **Hispanic males** and reading scores of **white males** from 1st to 8th grade in the lower-middle score percentiles
 - For **Hispanic females**, weight status had the most significant impact on math scores in upper percentiles (75th to 95th) and had varying impacts for obese, overweight and underweight students
 - For **black males and females**, being underweight has a large negative impact on reading scores (15th-25th) in 8th grade
 - For **white females**, being obese or overweight had negative significant impacts on math scores in lower-middle percentiles (15th-65th) in 1st and 5th grades

POLICY IMPLICATIONS

- Policies targeting childhood weight could have positive spillover effects on academic performance, particularly of lower performing students
- Policies should advocate healthy weight and an active lifestyle as to include underweight children
 - Local Wellness Policies from WIC Reauthorization Act
 - Better balanced school meals
 - National School Lunch Program (NSLP)
 - School Breakfast Program (SBP)
- Policies targeting children's health and performance should begin early



➤ Students eating meals through NSLP