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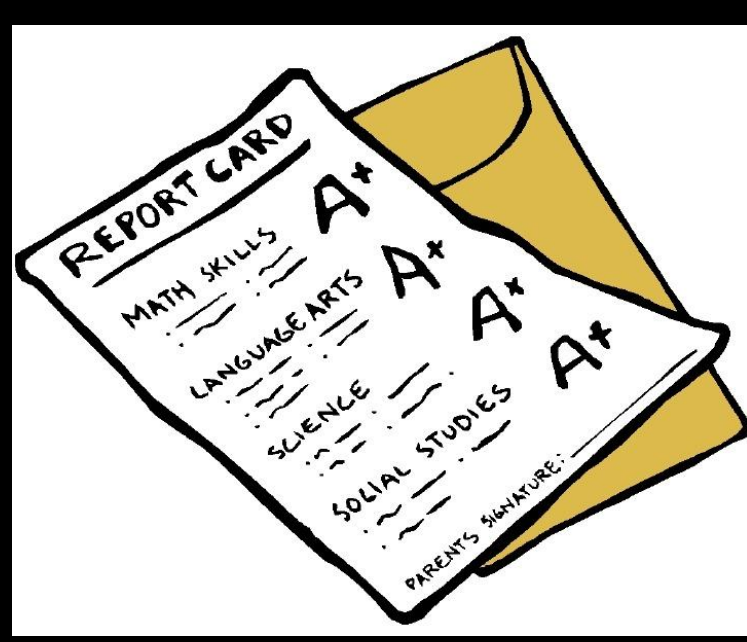
Spillover Effects of SBP and NSLP on Academic Performance

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INTRODUCTION

- Childhood misnourishment:
 - Caused by insufficient nutritional quality
 - Includes overweight, obese and underweight
- United States estimates:
 - 13+ million overweight children
 - 2.4 million underweight children
- Childhood misnourishment has been linked to academic achievement
- School Breakfast Program (SBP) & National School Lunch Program (NSLP)
 - Mixed results are found on relationship between meal program participation and child weight
 - SBP and breakfast consumption has been linked to academic achievement
 - Millimet, Tchernis and Husain (2010) call for more research of SBP and NSLP impacts on outcomes other than weight

RESEARCH QUESTIONS

- What are key determinants of program participation?
- What are the direct impacts of program participation on body mass index (BMI)?
- What are the direct and indirect impacts of program participation on academic performance?
- Do impacts differ depending on:
 - whether students receive free- and reduced-price (FRP) meals versus pay full-price?
 - whether students are FRP eligible?

DATA

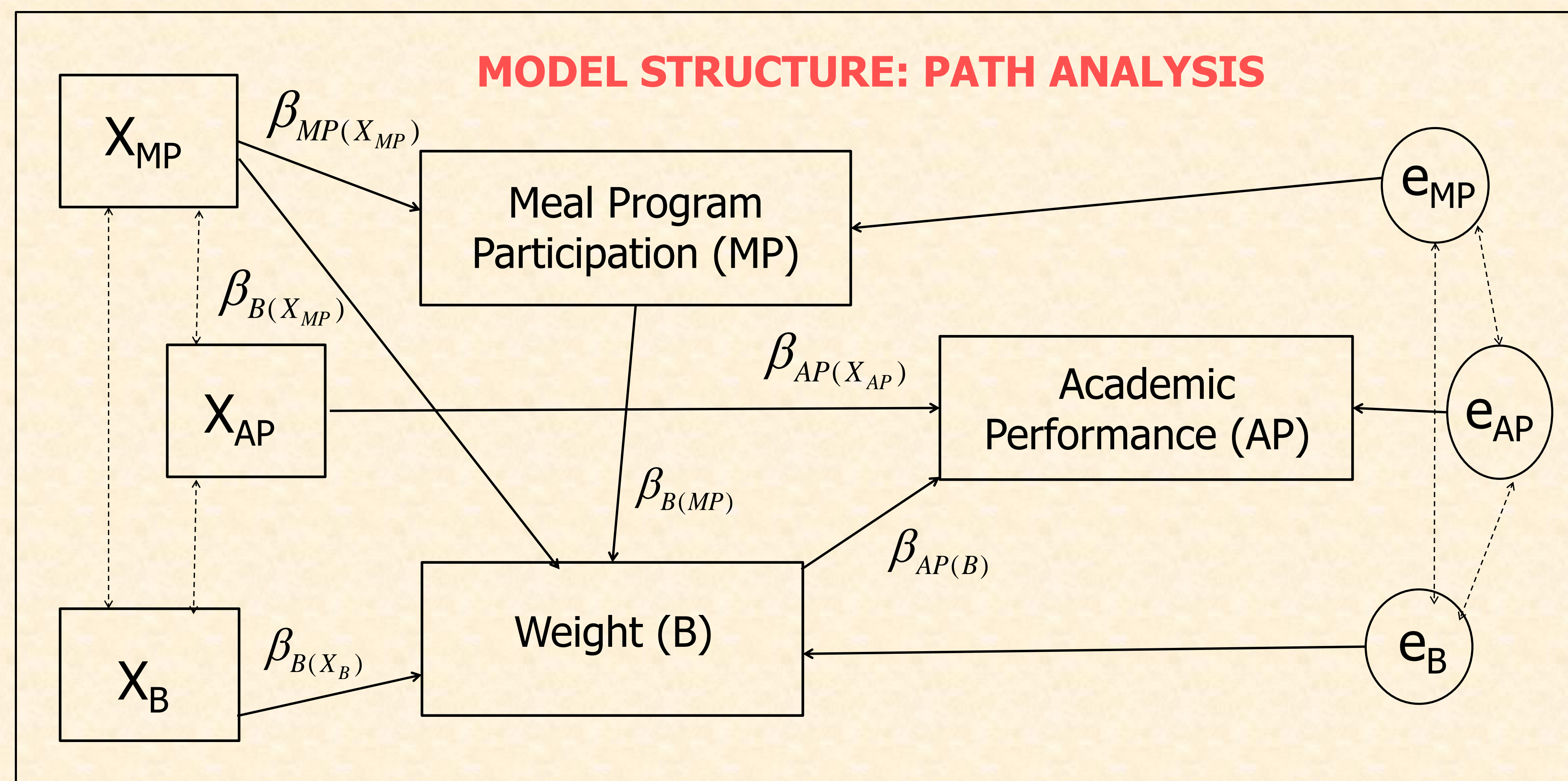
- Early Childhood Longitudinal Study-Kindergarten Class
- Nationally representative sample of 21,260 children followed from kindergarten (1998-1999) to 8th grade
- Information on children, parents, teachers and schools
- Staff measured weight and height of the students
- SBP and NSLP participation information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

EMPIRICAL APPROACH

Structural Equation Model

- Uses an equation system to test underlying mechanisms
- Models endogeneity and gains efficiency
- Examines direct and indirect effects of all variables
 - allows us to answer different policy questions
- Full-information maximum likelihood
- Important to account for self-selection into SBP and NSLP
- Simultaneously estimate 7 equations:
 - 2 selection equations
 - 3 child choice equations
 - child weight production function
 - child achievement production function

MODEL STRUCTURE: PATH ANALYSIS



SUMMARY OF FINDINGS

Significant Determinants of Program Participation

- All Participants:
 - race/ethnicity (particularly Hispanic)
 - household income
 - father's education
 - urbanity (rural/urban/suburb)
 - whether the child participated in the program the year before
 - indicator for whether the mother works full-time
 - Food Stamp recipients (FRP participants only)
- By Eligibility:
 - race/ethnicity
 - mother works full-time
 - past program participation

Program Impacts on Child Weight

- All Participants:
 - SBP increases BMI z-scores of 8th grade students with a larger effect on FRP recipients
- By Eligibility:
 - NSLP decreases BMI z-scores of 8th grade FRP eligible participating students

Program Impacts on Academic Achievement

- All Participants:
 - large positive direct impact of NSLP participation on math scores
 - small positive indirect impact of SBP participation on math and English scores (particularly FRP recipients)
 - small negative indirect impact of NSLP participation on math and English scores
- By Eligibility:
 - large positive direct impact of NSLP participation on math and English scores
 - small negative indirect impact of NSLP participation on math and English scores



POLICY IMPLICATIONS

- Integral impact on the weight of school meal program participants especially those in 8th grade
 - provides motivation for initiatives calling for healthier meals particularly for SBP
- Healthier meals may entice more parents to have their children participate in SBP and NSLP
- Need to consider how children will respond to healthier meals and whether they will consume the food
- Minimal impacts on elementary achievement
 - Highest participation rates in elementary school → need to increase impacts on performance through more nutritious meals
- Important to recruit FRP eligible students to participate in the programs
 - they are the ones particularly impacted by programs (nutritional and academically)
 - they are the ones most in need (nutritional and academically)
- Because FRP eligible children are most impacted, creative advertising making participation trendy and enticing should increase participation and decrease negative associations with the programs