Introduction

• Mothers increasing their education after the birth of a child is increasingly common (Perna, Fester & Walsh, 2010)

• Maternal education is linked with a number of developmental outcomes for children:
  - Cognitive skills in early childhood (Dollaghan, 2007)
  - Academic achievement in elementary-, middle-, and high- school (Reardon, 2011; Sirin, 2005)
  - Behavioral problems (Hughes & Ensor, 2009)
  - Improved health (Currie & Moretti, 2003)

• Increases in maternal education and level of maternal education may have different associations with children’s outcomes
• Increases in maternal education have been associated with increases in young children’s cognitive scores (Magnuson, 2007; Magnuson, Sexton, Davis-Keane & Huston, 2009)
• No research has explored the relationship between increases in maternal education and other development outcomes

Research questions

Research Question 1: Are increases in maternal education associated with increases in children’s cognitive scores between ages three or four and first grade?

Research Question 2: Are increases in maternal education associated with changes in children’s behavioral problems between ages three or four and first grade?

Sample

• 1588 families from the National Head Start Impact Study (U.S. Dept of HHS, 2010)
• Annual parent interviews, child assessments and teacher reports between when children are aged three or four (baseline) and first grade

Measures

Increases in maternal education (0,1)
1) mothers reported increases in their level of education between baseline and kindergarten
  • 14 categories, “less than 8th grade” to “professional degree after bachelor’s degree” and
2) mothers attending or enrolling in courses from a school, college or university during the study

Sixteen percent (262) of mothers increased their education

Measures (continued)

Outcomes (first grade)
• Woodcock-Johnson III Tests of Achievement composites
  - Pre-Academic Skills, Basic Reading Skills, Math Reasoning, Academic Skills, Academic Applications
  - Teacher reported Adjustment Scales for Pre-school Intervention (Lutz, Fantuzzo & McDermott, 2000)
  - Externalizing (aggressive, oppositional, inattentive)
  - Internalizing (withdrawn, socially reticent)

Table 1. Increases in maternal education are associated with significant increases in children’s cognitive scores between ages three or four and first grade

Covariates
• Thirty-four baseline maternal, familial, child covariates
• Baseline cognitive scores
• Woodcock-Johnson III Tests of Achievement subtests
• Peabody Picture Vocabulary Test
• Preschool Comprehensive Test of Phonological and Print Processing
• Parent reported behavioral problems (FACES, 2000)

Analysis plan

• Use propensity scores to model the probability of mothers increasing their education
  - \( \text{Probit}(P(Z = 1)) = \beta_0 + \sum \beta_{X_{nm}}x_{nm} \)
• Inverse probability of treatment weighting (Imbens, 2004; Rosenbaum, 1987)
  - \( W_i = Z_i + ((1 - Z_i)p / 1 - P) \)
• Propensity-score weighted regression analyses with covariates
  - \( Y_i = \beta_0 + \beta Z + \sum \beta_{X_{nm}}x_{nm} + \epsilon_i \)
• Compare results to OLS regression with covariates

Table 2. Increases in maternal education are associated with significant increases in children’s cognitive scores between ages three or four and first grade

Selected balance results

Table 3. Increases in maternal education are associated with significant increases in teacher reports of children’s externalizing behavior problems between ages three or four and first grade

Future research

• Preliminary analyses indicate that effects vary by gender and mothers’ baseline level of education
• Explore increases in different types of education (e.g. gaining a credential vs. completing an additional year of schooling)
• Further exploration of possible mediators, especially to understand the increases in behavioral problems
  - Lack of support for low-income mothers increasing their education?
  - Increases in time spent in out of home care?

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