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Background

- Parenting practices in early childhood can have lasting impacts on child development.
- Parenting practices in early childhood are associated with changes in brain size and brain development.1-4
- Parental cognitive stimulation at early ages has been associated with higher cognitive scores at later ages in intervention studies.5
- There is a lack of evidence from large scale studies, possibly due to endogeneity issues: cognitive stimulation may be associated with a general parenting style that also influences cognitive performance; demonstrated cognitive ability may influence the amount of cognitive stimulation undertaken by parents.6

Data

- Encuesta Longitudinal de la Primera Infancia (Longitudinal Survey of Early Childhood Development)
  - The sample of 16,033 children was selected using a cluster-stratified, random-sampling strategy
  - Collected in 2010 and 2012 as a nationally representative sample of children in Chile
  - Data on children born 2005-2009 were collected in 2010; longitudinal data plus data on a refreshment sample of children born 2009-2011 were collected in 2012
  - This analysis focuses on children ages 4-6 years in 2012
- Cognitive tests (collected in 2012):
  - Peabody Picture Vocabulary Test (PPVT) (Spanish version)
    - measures receptive and oral vocabulary from 30-60 months
  - Battelle Development Inventory
    - measures a range of abilities from ages 6-23 months
    - has been used to represent child cognitive and intellectual ability in developing countries
  - TADI (Cognitive)
    - includes cognitive, adaptive, communication, motor, and social skills

Test of Learning and Child Development (TADI)

- a child development test that was developed in Chile
- only the cognitive component used here
- Parental Stimulation (in 2012)

First principal component (using principal components analysis) of 5 observations from the HOME score on learning materials, such as availability of toys teaching shapes or colors, puzzles, children’s books, learning games, etc.

Methods

- Instrumental variables (IV) method allows us to untangle endogeneity problem
- IV must be a variable highly correlated with the endogenous variable of interest (cognitive stimulation) but not with the outcome variable (cognitive test scores):
  - cov(instrument, endogenous variable) = 0 and cov(instrument, outcome) = 0
- Exploit information on participation in a large public program Chile Crece Contigo (CCCT), designed to improve early childhood development in Chile, which may provide some of the following to eligible families (based on means-testing): information packets, learning materials, books, crib, baby carrier, home visits, and parenting workshops.
- Other services, such as phone-an-expert, a radio program, and a website, are available to all.
- The three instruments used in this analysis are:
  1. Local awareness by community of the existence of CCCT
  2. Local participation by community in parenting workshops
  3. Local participation by community in the public health insurance program FONASA (note: FONASA is available to anyone but families with more income tend to choose private insurance)7
- Higher local prevalence of CCCT participation is correlated with parental cognitive stimulation, but not cognitive scores
- Higher parental cognitive ability (WAIS) has surprisingly small association with cognitive scores for both OLS and IV models
- Parental cognitive stimulation is significantly associated with child cognitive scores
- OLS estimates of parental cognitive stimulation are underestimated, while income effects are over-estimated due to endogeneity issues
- OLS erroneously attributes some of the “effect” of learning materials to income
- Mother’s cognitive ability (WAIS) has surprisingly small association with cognitive scores for both OLS and IV models

Results

- PPVT (n=6,654)
- TADI (n=6,604)
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Why instrumental variables?

- Direct estimation of parental cognitive stimulation on cognitive outcomes
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Discussion

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References