Studying Early Care and Education Programs Using Administrative Records

NAWRS presentation

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Summary: What?

- Data exploration analytical work (uses Illinois administrative records)
- Study enrollment in multiple early care and education (ECE) programs through the early childhood cycle
  - 1) Head Start (HS);
  - 2) state funded pre-K and;
  - 3) CCDF-childcare subsidy programs
- Estimate associations between participation in those programs and third grade school test scores
  - Estimates across programs and age ranges (0-3/3-5)
  - Also with reference to a no-program state
Limited knowledge about:

- How do families use ECE programs through early childhood?
- How do enrollment of children in those programs affects their development (cognitively/socio-emotionally)?
- How do programs rank on the basis of quality?
  - Evidence often extrapolated from small-scale, highly intensive programs
  - Most of the evidence is short-term outcomes
Summary: How?

Form a unique database of linked administrative records:

3rd graders in Chicago Public Schools (2007-2008) retrospectively followed in:

- Child Care and Development Fund subsidies
- Head Start
- State funded pre-K

And their households followed in:

- TANF
- SNAP
- UI wages
- 2000-Census

Model selection into those programs (and program types)

Compute semi-parametric regressions (inverse probability weighting; Hirano, Imbens, and Ridder (2003))
Outline

1. Data
2. Methods
3. Results: only on math (similar for reading)
4. Conclusions
Outline

1. Data

2. Methods

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4. Conclusions
Data

Retrospectively follow 3rd grade cohort (2007-2008) in Chicago Public Schools:

- Framed in SNAP (subset to low income; recover HH info)
  - Matched birth-5 to Head Start, CPS-pre-K and CCDF (centers, homes, relatives, non-relatives)

Recover pre-determined variables for mothers and households in:

- TANF, SNAP (participation)
  - Unemployment insurance (wages and employment)
  - Match residential addresses to census tract data (2000-SF3 files)

Recover Illinois Standardized Achievement Tests (ISAT 3rd grade; math and reading)
Data: a research database

CPS 3rd grade Students

CHDHSID

CHDHSID

MOTHER

Agerange (16-40)

UNEMPLOYMENT INSURANCE:
• Quarterly earnings

Head Start:
• Take up
• Type

INDIVIDUAL_ID

CHILDCARE SUBSIDIES:
• Take up
• Amount
• Type

FOOD STAMPS
CASE:
• Dates of birth
• Number of people
• Education (TANF)
• Gender

2000 CENSUS:
• Demographics
• Community area
• Census tract
• Census block group

CPS:
• PRE-K ENROLLMENT
• Dates of birth
• Names
• Language
• Ethnicity
• Disability
• Cared by mother
• ISAT/ITBS
• School characteristics
• Address

W. Zanoni (Chapin Hall )
ECE programs and test scores
August, 2013
Data: Treatment and outcomes

1. Treatments:
   - Challenges to define treatments: program collaboration; discontinuity in supply by age; differential dosages; multiple ages at first subsidy receipt
     - Ages at first program take up 0-35 months CCDF (centers, homes, relatives, non-relatives)
     - Ages at first program take up 36-59 months CCDF (centers, homes, relatives, non-relatives) + HS + CPS-pre-K

2. Outcomes are third grade ISAT test scores:
   - Math
   - Reading
Data: Descriptive statistics reveal

- Parental choice of child care subsidies (CCDF) is heavily driven by a pre-program dip in earnings.
- Disadvantaged children (lower SES, parental education, etc.) are more often exposed to subsidize care by relatives and non-relatives than less disadvantaged children.
  - They differ from children never exposed.
- Less disadvantaged children are more often exposed to center-based care (CCDF-centers, HS and pre-k).
  - Families who utilize center-based child care programs look remarkably similar.
Data: pre-program dip in earnings

Figure 1. Employment and earning series (by type of care and age of the child)
1 Data

2 Methods

3 Results: only on math (similar for reading)

4 Conclusions
Methods

1. **Multiple counterfactuals:**
   - Anchor treatment/participation in one program and use other programs as counterfactuals
   - Estimate effects with reference to a no-treatment state (children never exposed)

2. **Employ semi-parametric regression** [inverse probability weights; Hirano, Imbens and Rider (2003)]
   - Matching on observables
   - Compute a propensity score per effect (maximizes \# correctly classified obs; exponentials/interactions)
   - Compute an OLS regression with inverse probability weights (on common support area)
Outline

1. Data
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## Table A. Summary of results

<table>
<thead>
<tr>
<th>Ages 0-3</th>
<th>Program effects</th>
<th>Effects across programs</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CCDF-homes (+ math/read)</td>
<td>CCDF-licensed programs</td>
</tr>
<tr>
<td></td>
<td></td>
<td>outscore license-exempt ones</td>
</tr>
<tr>
<td>Ages 3-5</td>
<td>Head Start, pre-K (+ math/read)</td>
<td>Center-based programs</td>
</tr>
<tr>
<td></td>
<td></td>
<td>outscore license-exempt CCDF</td>
</tr>
<tr>
<td>Ages 0-3 and 3-5</td>
<td>(CCDF-license-exempt at 0-3)+(Center-based programs at 3-5) better than (CCDF-license-exempt at 0-3)</td>
<td></td>
</tr>
</tbody>
</table>
Results: Math (0-3)

Effects of SECE programs on 3rd grade math ISAT test scores
(3rd grade; 0-3 over multiple counterfactuals)

Treatments:
- Center
- Home
- Relative
- Nonrelative
- No SECE

Counterfactuals:
- Center
- Home
- Relative
- Nonrelative
- No SECE
Results: Math (3-5)

Effects of SECE programs on 3rd grade math ISAT test scores
(3rd grade; 3-5 over multiple counterfactuals)
Results: Math (0-3)/(3-5)

Effects of license exempt SECE programs on 3rd grade math ISAT
(counterfactuals are children in license exempt (0-3) and other (3-5))
Outline

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Conclusions

- Administrative records provide a unique source of data to study ECE program participation and outcomes
  - Allows continuing monitoring: towards long term outcomes
- Challenges remain to properly define treatment:
  - Dosage: intensity
  - Collaboration across
- Preliminary results
  - Licensing matters
  - Head Start and pre-K effects appear fairly similar for this population of low income children
  - Some evidence of dynamic complementarities
- More research is needed integrating data-systems across ECE programs