Public Childcare, Child Development, and Labor Market Outcomes

Orazio Attanasio, Ricardo Paes de Barros, Pedro Carneiro, David K. Evans, Lycia Lima, Pedro Olinto, and Norbert Schady
Motivation: We know a lot more about preschool than daycare

Number of studies on the impact of...
Motivation: We know a lot more about preschool than daycare

The vast majority of this evidence is from high-income environments.
Motivation: We know a lot more about preschool than daycare

The vast majority of this evidence is from high-income environments.

This study adds to just three others on center-based daycare in low- or middle-income countries.
What is the impact of publicly provided daycare for children age 0-3

• on subsequent child development and
• on outcomes for the rest of the household?
This paper

Tests the impact of publicly provided daycare over the course of seven years using a lottery to assign children to daycare in low-income neighborhoods of Rio de Janeiro, Brazil.
The program

• Full-time daycare on weekdays: 7am-4:30pm

• Activities: physical play, storytelling, art, music, rest

• 5 meals or snacks a day
Empirical strategy
To daycare or not to daycare: A random assignment

- 244 daycare centers with 11,640 spaces available
- 25,511 children applied
- 1,617 with special needs automatically provided spaces
- Lottery for remaining 10,022 spaces
- 4,350 children selected for evaluation (winners vs end of wait list)
Data

Administrative data 2007

- Application to a daycare center
- Identification (name, gender, date of birth)
- Basic household data (size, work status)

Survey Round 1 2008

- Daycare status
- Labor market outcomes
- Income and assets
- Caregiver stress

Survey Round 2 2012

- History of daycare attendance
- Labor market outcomes
- Cognitive function
- Child behavior
- Anthropometrics

Survey Round 3 2015

- Slight variation on Round 2
## Data: Balance

<table>
<thead>
<tr>
<th>Variable</th>
<th>Lost the lottery</th>
<th>Won the lottery</th>
<th>Variable</th>
<th>Lost the lottery</th>
<th>Won the lottery</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>0.51 (0.50)</td>
<td>0.53 (0.49)</td>
<td>Prenatal care</td>
<td>0.95 (0.22)</td>
<td>0.94 (0.23)</td>
</tr>
<tr>
<td>Black</td>
<td>0.12 (0.33)</td>
<td>0.11 (0.31)</td>
<td>Planned birth</td>
<td>0.33 (0.47)</td>
<td>0.35 (0.48)</td>
</tr>
<tr>
<td>Birthweight (kilos)</td>
<td>3.19 (0.62)</td>
<td>3.21 (0.61)</td>
<td>Household per capita income</td>
<td>586.2 (1818.9)</td>
<td>634.5 (2841.3)</td>
</tr>
<tr>
<td>Birth height (centimeters)</td>
<td>49.26 (4.07)</td>
<td>49.29 (4.23)</td>
<td>Household size</td>
<td>4.55 (3.46)</td>
<td>4.64 (4.55)</td>
</tr>
<tr>
<td>Age of mother at birth</td>
<td>20.28 (4.90)</td>
<td>20.37 (4.97)</td>
<td>Age of caregiver</td>
<td>29.25 (9.77)</td>
<td>29.15 (9.16)</td>
</tr>
<tr>
<td>Breastfed to 6 months</td>
<td>0.77 (0.42)</td>
<td>0.75 (0.43)</td>
<td>Caregiver can read/write</td>
<td>0.97 (0.18)</td>
<td>0.98*** (0.13)</td>
</tr>
</tbody>
</table>
### Data: Attrition

<table>
<thead>
<tr>
<th></th>
<th>Attempted</th>
<th>Total found</th>
<th>Attrition</th>
<th>Winners</th>
<th>Losers</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
<td>N</td>
</tr>
<tr>
<td>Sample 2007 lottery</td>
<td>4,348</td>
<td>0</td>
<td>2,174</td>
<td>50%</td>
<td>2,174</td>
</tr>
<tr>
<td>Sample 2008 survey</td>
<td>4,348</td>
<td>13%</td>
<td>1,912</td>
<td>51%</td>
<td>1,865</td>
</tr>
<tr>
<td>Sample 2015 total</td>
<td>3,115</td>
<td>34%</td>
<td>1,059</td>
<td>52%</td>
<td>991</td>
</tr>
</tbody>
</table>

Attrition is higher for those who lost the lottery, but there is no systematic difference across observed characteristics.
Results
Does winning the daycare lottery increase access to daycare?

Lottery winners had 0.64 additional years in daycare.

All these estimates are highly statistically significant.
How does winning the daycare lottery impact households?

Currently employed

- **2008**
  - Caregiver

- **2012**
  - Caregiver
  - Mother
  - Grandparent
  - Older sibling

- **2015**
  - Caregiver
  - Mother
  - Grandparent
  - Older sibling

Significance levels:
- **99% significant**
- **90% significant**
- **Not significant**
How does winning the daycare lottery impact households? Labor force participation

Currently employed

- 99% significant
- 90% significant
- Not significant

Similar results for monthly income and – for grandparents and siblings – social security contributions.
How does winning the daycare lottery impact households? Assets and income

- Household income
  - 2008: 40
  - 2012: 110 (95% significant)
  - 2015: 60

- Asset index
  - 2008: 0.06
  - 2012: 0.13 (95% significant)
  - 2015: 0.04
How does winning the daycare lottery impact households? Home environment

Total time carer spends with the child

-14 -12 -10 -8 -6 -4 -2 0 2

- 99% significant
- 95% significant
- 90% significant
- Not significant

Year

2008 2012 2015
How does winning the daycare lottery impact households?
Home environment

- Ever reads or sings
  - 2012: Not significant
  - 2015: 90% significant
- Number of books > 7
  - 2012: Not significant
  - 2015: 90% significant
- Negative attitudes
  - 2012: 95% significant
  - 2015: Not significant
- Stress
  - 2008: 99% significant
  - 2012: 99% significant
  - 2015: Not significant
How does winning the daycare lottery impact children? Anthropometrics

- **Height for age**
  - 2012: 0.15
  - 2015: 0.10

- **Weight for age**
  - 2012: 0.20
  - 2015: 0.15

Legend:
- 99% significant
- 95% significant
- 90% significant
- Not significant
How does winning the daycare lottery impact children?
Cognitive function

**Aggregate cognitive z-score**

- **2012**: 0.02 (99% significant)
- **2015**: 0.02 (99% significant)

**TVIP**

- **2012**: 0.12 (95% significant)
- **2015**: 0.12 (95% significant)

**Executive function**

- **2012**: 0.06 (90% significant)
- **2015**: 0.06 (90% significant)

**Memory for names**

- **2012**: 0.06 (95% significant)
- **2015**: 0.06 (95% significant)

**Visual integration for names**

- **2012**: Not significant
- **2015**: Not significant

David Evans | @DaveEvansPhD | December 10, 2019 | CGDev.org
How does winning the daycare lottery impact children?  
Child behavior

<table>
<thead>
<tr>
<th>Aggregate CBQ z-score</th>
<th>2012</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frustration</td>
<td>2012</td>
<td>2015</td>
</tr>
<tr>
<td>Attention</td>
<td>2012</td>
<td>2015</td>
</tr>
<tr>
<td>Impulsivity</td>
<td>2012</td>
<td>2015</td>
</tr>
</tbody>
</table>

- 99% significant
- 95% significant
- 90% significant
- Not significant
Mediation analysis: What drives the anthropometrics?

- Weight-for-age 2012
  - Basic coefficient
  - with income mediators
  - with home mediators
  - with both

- Height-for-age 2012
  - Basic coefficient
  - with income mediators
  - with home mediators
  - with both
Summary of findings

Impacts for children

- Anthropometrics ➔
  - Height-for-age ➔
  - Weight-for-age ➔

- Child cognitive development ➔
  - Receptive vocabulary ➔
  - Perceptual reasoning ➔
  - Not in several other measures

- Child behavior ➔

Impacts for households

- Labor force participation ➔
  - Current employment and income for main caregiver, grandparents, and older siblings ➔

- Income ➔
  - Initial rise, then catch-up

- Home environment ➔
  - Time with caregiver ➔ initially
  - Stress of caregiver ➔
  - Singing and reading ➔
  - Range of other outcomes ➔