Caring (about) Policies:  
Child Care and Child Outcomes in UK and in Italy

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Child Care Policies  
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Idea of the work

- We study the association between formal child care attendance under 3 and later child outcomes using UK and Italian data.
- We allow the effect of formal child care to be different for children from different family backgrounds.
- Exploiting the heterogeneity of the child care effects, we simulate:
  - The impact of proving free child care to children from more disadvantaged families (UK - private system).
  - The impact of different selection criteria (Italy - mainly public system).
- For both countries, we present:
  - Methods, data, and results.
  - Heterogeneous effects of child care.
  - Simulations.
United Kingdom
UK outline

1. We study the association between formal child care and child cognitive outcomes at age 3, 5, 7, and 11, using data from the Millennium Cohort Study.

2. We control for a large number of variables (child and household characteristics, other schooling and family inputs, past child outcomes).

3. We allow the effect of formal child care to be different for children from families with different level of income.

4. We simulate how an increase in formal child care attendance can affect inequalities across children.
Data & Variables

Millennium Cohort Study:
Data & Variables

Millennium Cohort Study:

- Wave 1: 9 months old
  - Motion
  - Motor
  - Communication

- Wave 2: 3 years old
  - School reading
  - Naming vocab.

- Wave 3: 5 years old
  - Naming vocab.
  - Picture simil.
  - Pattern constr.

- Wave 4: 7 years old
  - Pattern constr.
  - Word reading
  - Number skills

- Wave 5: 11 years old
  - Verbal simil.
  - Spatial
  - Working mem.
Data & Variables

Millennium Cohort Study:

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Child care

Child care
Data & Variables

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Child care

Child, family, mother, and father characteristics.
## Data & Variables

### Millennium Cohort Study:

<table>
<thead>
<tr>
<th>Wave 1</th>
<th>Wave 2</th>
<th>Wave 3</th>
<th>Wave 4</th>
<th>Wave 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>9 months old</td>
<td>3 years old</td>
<td>5 years old</td>
<td>7 years old</td>
<td>11 years old</td>
</tr>
<tr>
<td>Motor</td>
<td>Naming vocab.</td>
<td>Picture simil.</td>
<td>Word reading</td>
<td>Spatial</td>
</tr>
<tr>
<td>Communication</td>
<td></td>
<td>Pattern constr.</td>
<td>Number skills</td>
<td>working mem.</td>
</tr>
</tbody>
</table>

### Child care
- Child, family, mother, and father characteristics.
- Father at home, new partner, hh income, new siblings.
Data & Variables

Millennium Cohort Study:

Wave 1  Wave 2  Wave 3  Wave 4  Wave 5
9 months old  3 years old  5 years old  7 years old  11 years old
Motion
Motor
Communication
School readin.
Naming vocab.
Picture simil.
Pattern constr.
Word reading
Number skills
Verbal simil.
Spatial
working mem.

Child care  Child care

Child, family, mother, and father characteristics.

Father at home, new partner, hh income, new siblings

Final sample: 7,240 children observed five times
Reduction due to: attrition and filter questions
Consequences: slightly older and more educated parents
# Child outcomes at age 3

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)$^a$</th>
<th>(3)$^b$</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Formal 18 m.</td>
<td>Formal 18 m.</td>
<td>Formal 3-5 y.o.</td>
</tr>
<tr>
<td>School Readiness</td>
<td>0.06$^*$</td>
<td>$-$</td>
<td>$-$</td>
</tr>
<tr>
<td></td>
<td>(0.03)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Naming Vocabulary</td>
<td>-0.11$^{***}$</td>
<td>$-$</td>
<td>$-$</td>
</tr>
<tr>
<td></td>
<td>(0.03)</td>
<td></td>
<td></td>
</tr>
</tbody>
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* $p<0.1$; ** $p<0.05$; *** $p<0.01$. Robust standard errors in parentheses.

Total number of observations: 7,240.

$^a$ Controlling also for formal care between age 3 and 5 y.o.

$^b$ Controlling also for past cognitive outcomes.
### Child outcomes at age 5

<table>
<thead>
<tr>
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<th>(3)&lt;sup&gt;b&lt;/sup&gt;</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Formal 18 m.</td>
<td>Formal 18 m.</td>
<td>Formal 3-5 yo.</td>
</tr>
<tr>
<td>Naming Vocabulary</td>
<td>0.01 (0.03)</td>
<td>0.00 (0.03)</td>
<td>-0.08*** (0.02)</td>
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<tr>
<td>Picture Similarity</td>
<td>0.10*** (0.04)</td>
<td>0.10*** (0.04)</td>
<td>0.03 (0.02)</td>
</tr>
<tr>
<td>Construction Score</td>
<td>0.00 (0.04)</td>
<td>0.00 (0.04)</td>
<td>-0.00 (0.02)</td>
</tr>
</tbody>
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## Child outcomes at age 7

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<tr>
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<tr>
<td></td>
<td>Formal</td>
<td>Formal</td>
<td>Formal</td>
</tr>
<tr>
<td></td>
<td>18 m.</td>
<td>18 m.</td>
<td>3-5 yo.</td>
</tr>
<tr>
<td>Construction Score</td>
<td>0.04</td>
<td>0.03</td>
<td>-0.03</td>
</tr>
<tr>
<td></td>
<td>(0.04)</td>
<td>(0.04)</td>
<td>(0.02)</td>
</tr>
<tr>
<td>Word Reading</td>
<td>0.01</td>
<td>0.01</td>
<td>0.03</td>
</tr>
<tr>
<td></td>
<td>(0.03)</td>
<td>(0.03)</td>
<td>(0.02)</td>
</tr>
<tr>
<td>Number Skills</td>
<td>0.07**</td>
<td>0.07**</td>
<td>0.00</td>
</tr>
<tr>
<td></td>
<td>(0.03)</td>
<td>(0.03)</td>
<td>(0.02)</td>
</tr>
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<tr>
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<th>(3)&lt;sup&gt;b&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Formal 18 m.</td>
<td>Formal 18 m.</td>
<td>Formal 3-5 yo.</td>
</tr>
<tr>
<td><strong>Verbal Similarities</strong></td>
<td>-0.01 (0.03)</td>
<td>-0.01 (0.03)</td>
<td>0.00 (0.02)</td>
</tr>
<tr>
<td></td>
<td></td>
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</tr>
<tr>
<td><strong>SWM Strategy</strong></td>
<td>0.03 (0.03)</td>
<td>0.02 (0.03)</td>
<td>-0.05** (0.02)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>SWM Time</strong></td>
<td>0.06 (0.04)</td>
<td>0.06 (0.04)</td>
<td>0.00 (0.03)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>SWM Errors</strong></td>
<td>0.11*** (0.04)</td>
<td>0.11*** (0.04)</td>
<td>-0.04 (0.02)</td>
</tr>
</tbody>
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Possible cumulative impact of child care

- Child endowments at 9 months have a positive and significant effect on outcomes at age 3
- All cognitive outcomes from age 3 have a positive and significant impact on subsequent outcomes, with School Readiness being one of those with the largest predictive power
- Pattern Construction at age 5 is highly correlated with Number Skills at age 7
- Pattern Construction and Number Skills at age 7 are highly correlated with Spatial Working Memory outcomes at age 11
Heterogeneous impacts of childcare

- The effect on Schooling Readiness, Number Skills, and Spatial Work Memory is positive and significant for children from low-income families.
- The effect on Naming Vocabulary is negative and significant for children from high-income families.
- The effect on Picture Similarity is positive and significant homogeneously across children.
Only 12% of children were attending formal child care when 18 months old

Would it be possible to reduce inequality in cognitive outcomes across children making easier the access to children from more disadvantaged background?

We investigate the effects of introducing free formal child care for children in the first, second,... decile of income

And simulate the impact on:

- The coefficient of variation
- Percentage of children with low scores
Inequality in School Readiness at age 3

Note: the red point/line represents the baseline condition, before the simulation.
Inequality in Picture Similarity at age 5

Note: the red point/line represents the baseline condition, before the simulation.
Italy
Italy outline

1. We study the association between formal child care and child outcomes at age 7, using own collected data from Northern Italy

2. We match treated children with untreated children with a close probability of demanding the service and a close probability of being offered the service

3. We allow the effect of formal child care to be different for children from intact/non-intact families, parents experiencing/not experiencing unemployment, only child/children with siblings

4. We simulate how different selection criteria (in six Italian municipalities) lead to different population of users and, therefore, to different gains
**Data & variables**

Children born in 2006 and interviewed in 2013

- **Retrospective information**
  - 0-5 years old

- **Interview**
  - 7 years old
Data & variables

Children born in 2006 and interviewed in 2013

Retrospective information

0-5 years old

Interview

7 years old
Like reading
Pro-social behavior
Data & variables

Children born in 2006 and interviewed in 2013

**Retrospective information**

- 0-5 years old
  - Child care

**Interview**

- 7 years old
  - Like reading
  - Pro-social behavior

Supply is a function of scores assigned to each applicant
Demand depends on the distance to the closest public child care centre, living in a single-headed household, having grandparents who live nearby, and the family's immigrant status

Other control variables: gender, age in months, siblings, parental education

Sample: 880 children
Data & variables

Children born in 2006 and interviewed in 2013

- Retrospective information
- Interview

0-5 years old

- Like reading
- Pro-social behavior

7 years old

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Like Reading at age 7

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<tr>
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<th>(4)</th>
<th>(5)</th>
<th>(6)</th>
<th>(7)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Both parents</td>
<td>One parent</td>
<td>No parent.</td>
<td>Parental</td>
<td>Only child</td>
<td>With sibling</td>
<td>Whole sample</td>
</tr>
<tr>
<td>Formal child care</td>
<td>0.11**</td>
<td>0.32</td>
<td>0.09</td>
<td>0.25***</td>
<td>0.11</td>
<td>0.15***</td>
<td>0.06</td>
</tr>
<tr>
<td></td>
<td>(0.05)</td>
<td>(0.21)</td>
<td>(0.06)</td>
<td>(0.08)</td>
<td>(0.11)</td>
<td>(0.05)</td>
<td>(0.10)</td>
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<tr>
<td>FCC*Single-head hh.</td>
<td>0.23</td>
<td>0.09</td>
<td>0.034</td>
<td>0.034</td>
<td>0.034</td>
<td>0.034</td>
<td>0.034</td>
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<tr>
<td></td>
<td>(0.19)</td>
<td>(0.11)</td>
<td>(0.11)</td>
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<td>(0.11)</td>
</tr>
<tr>
<td>FCC*One par. unempl.</td>
<td>0.09</td>
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<td>(0.11)</td>
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<td>(0.11)</td>
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<tr>
<td>FCC*Siblings</td>
<td>0.034</td>
<td>0.034</td>
<td>0.034</td>
<td>0.034</td>
<td>0.034</td>
<td>0.034</td>
<td>0.034</td>
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<tr>
<td></td>
<td>(0.11)</td>
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<tr>
<td>Observations</td>
<td>449</td>
<td>43</td>
<td>308</td>
<td>184</td>
<td>114</td>
<td>378</td>
<td>492</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.11</td>
<td>0.34</td>
<td>0.11</td>
<td>0.17</td>
<td>0.16</td>
<td>0.12</td>
<td>0.16</td>
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FCC: Formal child care.
* p<0.1; ** p<0.05; *** p<0.01. Robust standard errors in parentheses.
# Pro-social behavior at age 7

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<th>(5)</th>
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</tr>
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<tr>
<td></td>
<td>Both parents</td>
<td>One parent</td>
<td>No parent. unempl.</td>
<td>Parental unempl.</td>
<td>Only child</td>
<td>With sibling</td>
<td>Whole sample</td>
</tr>
<tr>
<td>Formal child care</td>
<td>0.67*** (0.16)</td>
<td>1.81* (0.91)</td>
<td>0.70*** (0.20)</td>
<td>0.71*** (0.26)</td>
<td>1.17*** (0.30)</td>
<td>0.59*** (0.19)</td>
<td>1.15*** (0.33)</td>
</tr>
<tr>
<td>FCC*Single-head hh.</td>
<td>-0.34 (0.35)</td>
<td>1.08* (0.64)</td>
<td>0.70*** (0.20)</td>
<td>0.71*** (0.26)</td>
<td>1.17*** (0.30)</td>
<td>0.59*** (0.19)</td>
<td>1.15*** (0.33)</td>
</tr>
<tr>
<td>FCC*One par. unempl.</td>
<td>-0.47 (0.36)</td>
<td>0.70*** (0.20)</td>
<td>0.71*** (0.26)</td>
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<td>1.15*** (0.33)</td>
<td>0.59*** (0.19)</td>
</tr>
<tr>
<td>FCC*Siblings</td>
<td>0.21</td>
<td>0.24</td>
<td>0.29</td>
<td>0.20</td>
<td>0.32</td>
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<td>0.20</td>
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<td>310</td>
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<td>118</td>
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<td>498</td>
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<tr>
<td>$R^2$</td>
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<td>0.29</td>
<td>0.20</td>
<td>0.32</td>
<td>0.19</td>
<td>0.20</td>
</tr>
</tbody>
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Selection criteria and child outcomes

- We use data from the Italian part of the European Survey on Living and Income Conditions (EU-SILC) for 2010
- We select the 1210 households with at least one child younger than three years old
- We use the criteria used by Turin, Milan, Bologna, Reggio Emilia, Rome, and Naples to assign scores to each household
- We rank households according to the scores
- We assign child care slots to the 50% with higher priority (N=605)
- We obtain six different populations of users
Selection criteria and users composition

Selection criteria and users composition

Single−head family household

One sibling

More siblings

Both parents employed

One parent employed

One parent looking for a job
Selection criteria and child outcomes at age 7

(a) Like reading

(b) Pro-social behavior
Selection criteria and municipality revenues
Conclusions

- We explored the link between early formal child care and child cognitive outcomes in the United Kingdom and in Italy.
- What we found is that attendance of formal child care under the age of 3 is positively associated with many child outcomes.
- Our results confirm previous findings showing that pre-school formal education improves the cognitive outcomes of disadvantaged children.
- We simulated the impact of two policies that increase the number/change the composition of children attending formal child care.
- Results of the simulations are valid assuming that child care effects are causal.