

Childcare and Commitment within Households

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Motivation and research questions

Education (parents) → childcare → education (children) → human capital accumulation → growth

Q1: How does the education of parents affect childcare?

Q2: What type of marital decision process determines childcare?

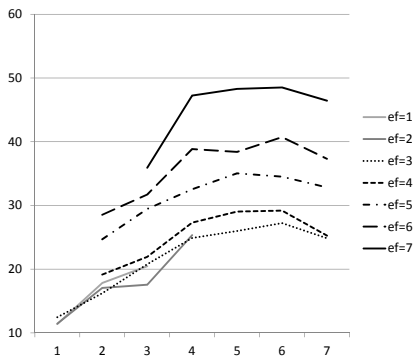
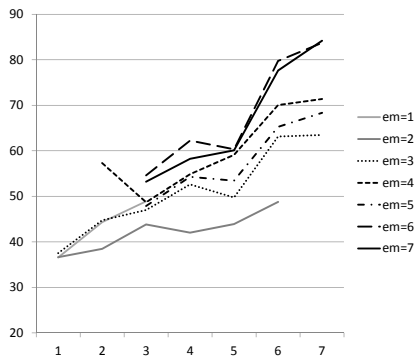
Data: ATUS+CPS 2003-2010

25-55 year old men (16,830) and women (19,314) who:

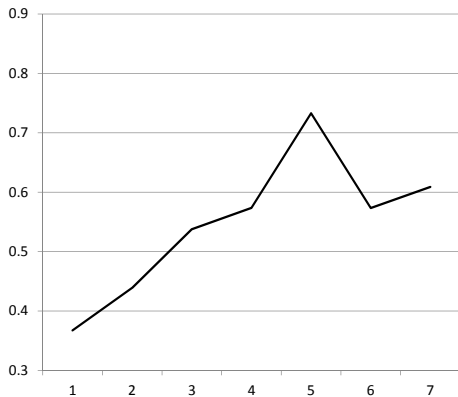
- live with their spouse (or unmarried partner)
- have at least one child under 18 in the household
- live with no other adult in the household

Education Level	Observations
No Education to Grade 8	1,245
Grades 9 to 12, no diploma	1,763
High School Diploma, no college	8,524
Some College but no degree	5,879
Associate Degree, Occupational/Vocational or Academic Program	3,853
Bachelor's Degree	9,641
Master's Degree, Professional School and Doctorate Degree	5,239

Childcare per child increases with education



Male childcare relative to female's increases with education



Literature

Facts linking childcare to education:

Sayer, Bianchi and Robinson (2004), Guryan, Hurst and Kearney (2008) and Ramey and Ramey (2010)

Marital decision models:

Collective models: Chiappori (1988, 1992) \Rightarrow efficient allocation.
Implicit assumption: there is a credible commitment.

Test of commitment: Mazzocco (2007)

Non-cooperative models: Anderson and Baland (2002), Doepke and Tertilt (2012), Cigno(2012)

On time allocation: Echevarria and Merlo (1999) , Iyigun (2005)

Contribution

Include corner solutions \Rightarrow important to explain the facts

Non-cooperative decision model allows to replicate the observed relationship between education and childcare

\rightarrow Couples make inefficient choices on the amount of childcare provided: children would gain 70 minutes more of childcare if parents cooperated

Reason: commitment matters!

lack of commitment \rightarrow non-cooperative choices \rightarrow
non-internalization of the positive externality of their choices on
the couple's utility \rightarrow indeterminacy

Setup

Individual utility:

$$\ln c + \mu \ln l_i + \gamma \ln(qn)$$

Constraints:

BC:

$$c = w_f e_f L_f + w_m e_m L_m$$

Quality of children:

$$q = t_f e_f^\alpha + t_m e_m^\alpha + \bar{q}$$

Time:

$$1 = L_i + (t_i + \bar{t}_i)n + l_i$$

Cooperative couple

Assumption: households commit to their choices

$$\max_{t_i, L_i} \ln c + \theta \mu \ln l_f + (1 - \theta) \mu \ln l_m + \gamma \ln(qn)$$

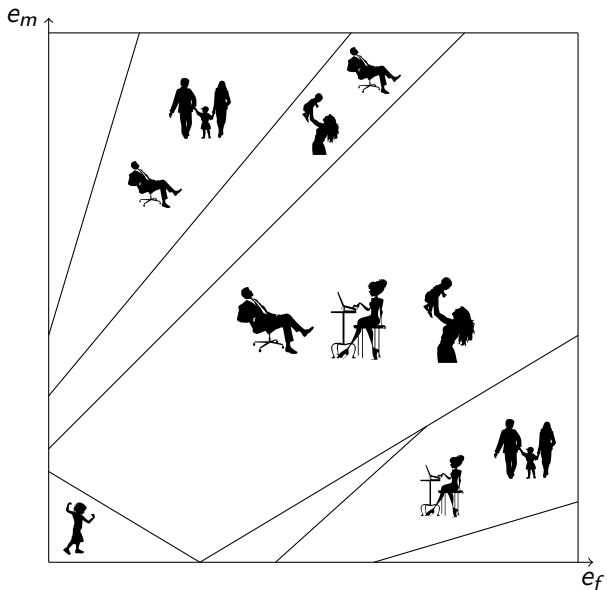
s.t.

$$1 = L_i + (t_i + \bar{t}_i)n + l_i, \quad q = t_f e_f^\alpha + t_m e_m^\alpha + \bar{q},$$

$$c = w_f e_f L_f + w_m e_m L_m, \quad L_i \geq 0 \quad \text{and} \quad t_i \geq 0.$$

⇒ 12 possible cases

Cooperative couple: cases with respect to education



Semi-cooperative couple

1. Collective choice on labor supplies:

labor contract \Rightarrow commitment.

2. Individual choice on childcare:

no clause on childcare allocation in the marriage contract \Rightarrow no commitment.

Semi-cooperative couple: 2 steps

2. Cournot-Nash on childcare

$$\max_{t_i} \ln c + \mu \ln l_i + \gamma \ln(qn)$$

L_f and L_m given \Rightarrow 4 cases

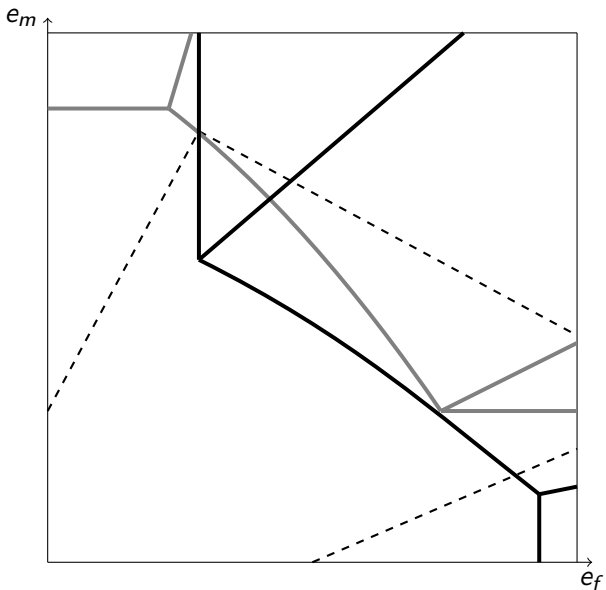
Individuals do not internalize the positive externality of their choice on childcare on the utility of the couple

1. Collective decision on labor

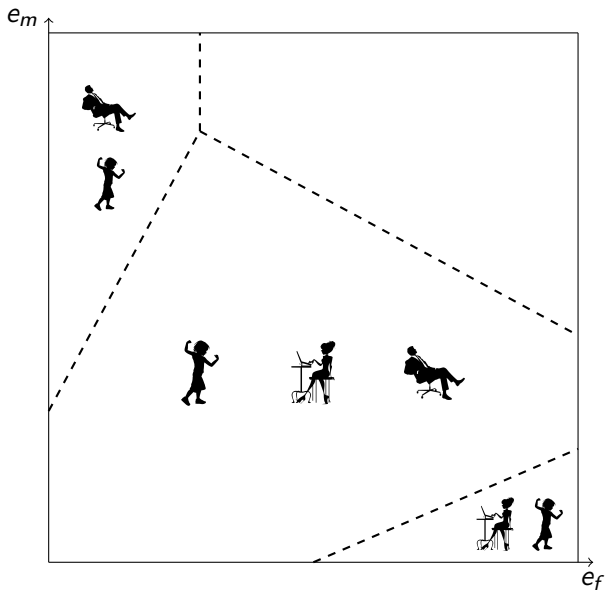
$$\max_{L_i} \ln c + \theta \mu \ln l_f + (1 - \theta) \mu \ln l_m + \gamma \ln(qn)$$

given $t_i(L_i) \Rightarrow 3 \times 4$ cases

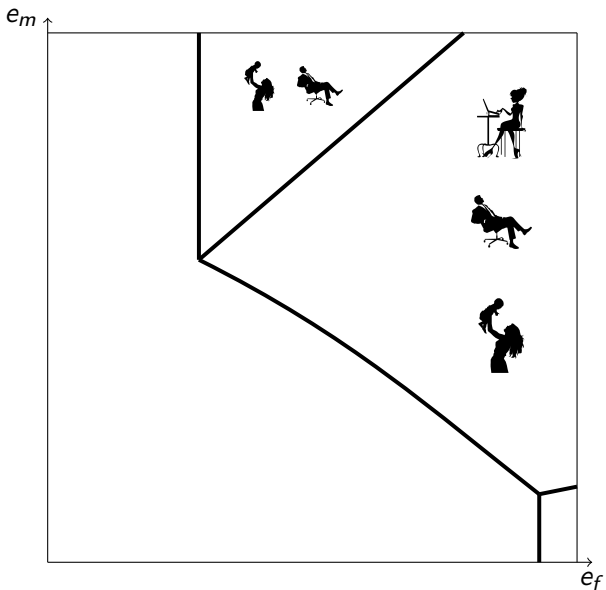
Semi-cooperative couple: cases with respect to education



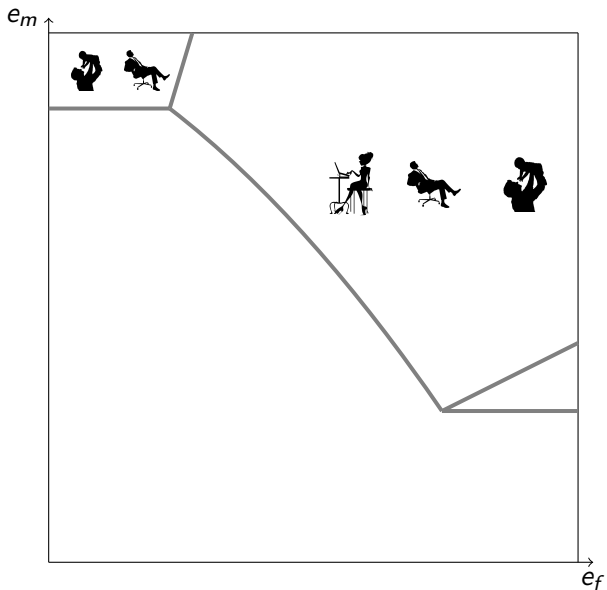
Semi-cooperative couple: $t_f, t_m = 0$



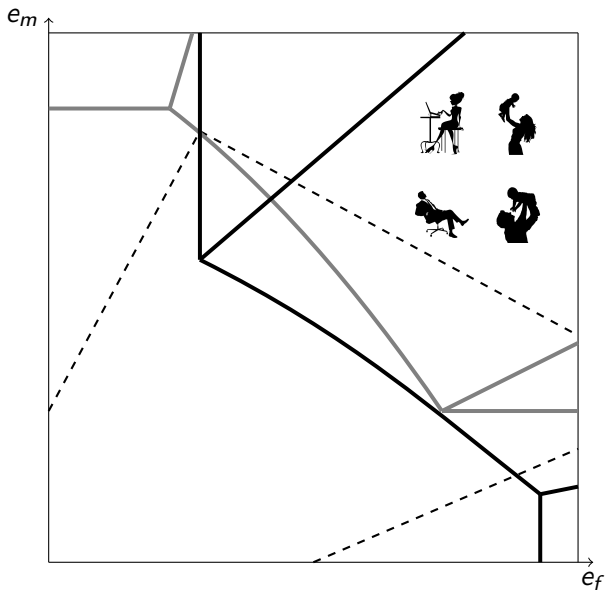
Semi-cooperative couple: $t_f > 0$ and $t_m = 0$



Semi-cooperative couple: $t_m > 0$ and $t_f = 0$



Semi-cooperative couple



Selection Criteria

1. Random choice of the equilibrium
2. Machist society
3. Feminist society

Estimation

Parameters a priori fixed: $\theta = 0.5$, $n = 2$, $w_m = 1$, $w_f = 0.9$

Education: $e_i = \exp 0.1e$

7 other parameters are estimated, for each model, with SMM

$$\min_p \left(\frac{d - s(p)}{d} \right)^2$$

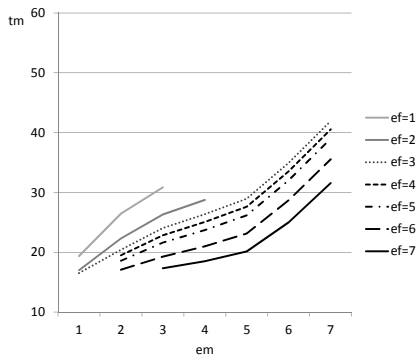
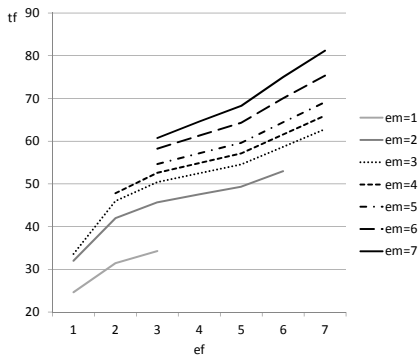
$s(p)$: draw $10,000 \times 7 \times 7$ households $\rightarrow t_f, t_m \rightarrow$ aggregate

Optimization algorithms: PIKAIA and UOBYQA

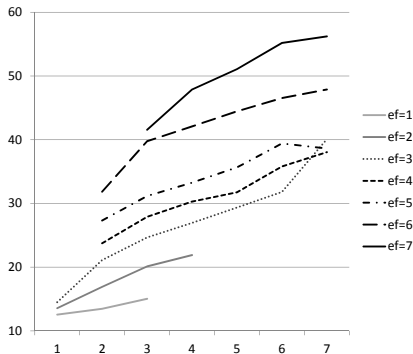
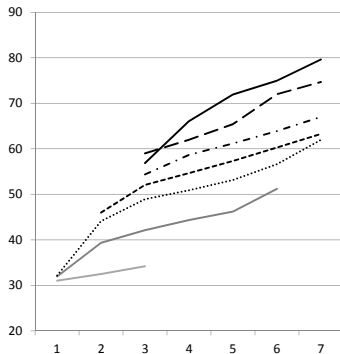
Estimated parameters

ρ	Name of the Parameter	(1)	(2)	(3)	(4)
\bar{q}_{me}	Mean of the lognormal distribution for \bar{q}	1.593	0.257	1.688	1.182
\bar{q}_{se}	S.E. of the lognormal distribution for \bar{q}	2.808	0.240	1.089	2.662
μ	Preference for leisure	0.832	1.189	0.371	1.599
γ	Preference for child quality	3.349	1.559	1.082	3.397
α	Returns to parent education on childcare	1.089	1.019	1.287	0.473
\bar{t}_f	Fixed time providing childcare (female)	0.000	0.051	0.079	0.031
\bar{t}_m	Fixed time providing childcare (male)	0.027	0.021	0.010	0.025
f	Value of the objective function	4.718	1.026	3.438	2.258

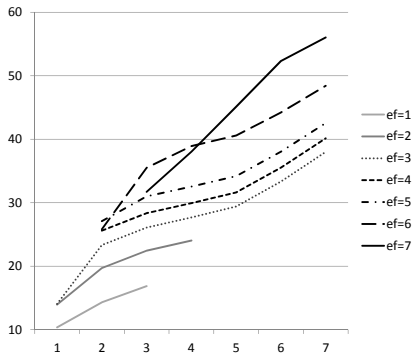
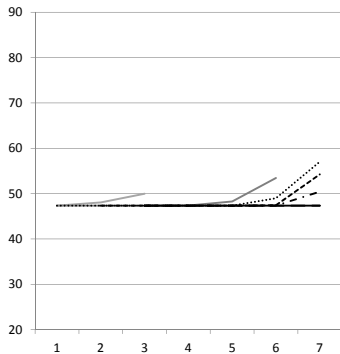
Cooperative model



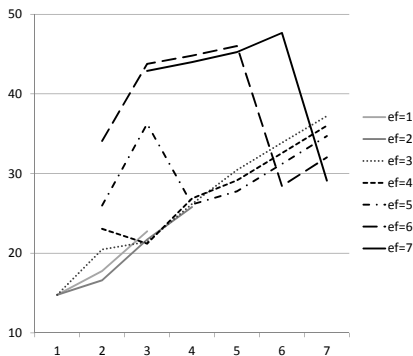
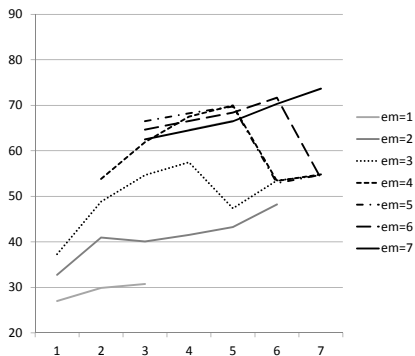
Semi-cooperative model, random equilibrium



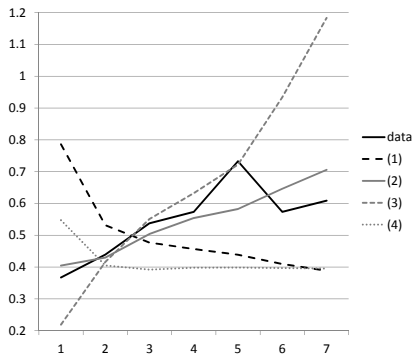
Semi-cooperative model, machist society



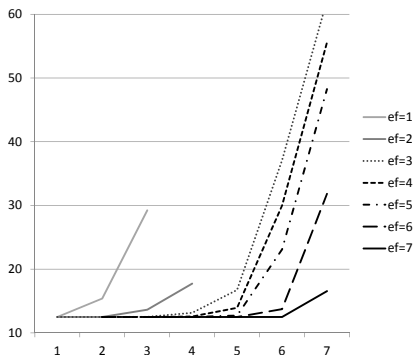
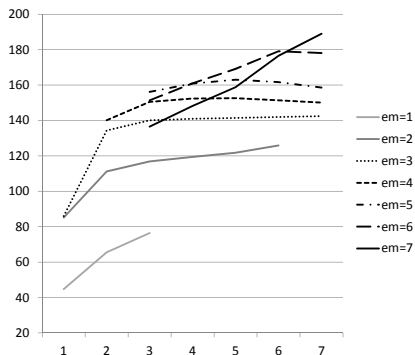
Semi-cooperative model, feminist society



Gender gap in childcare



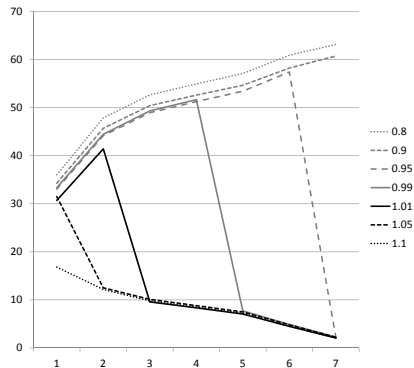
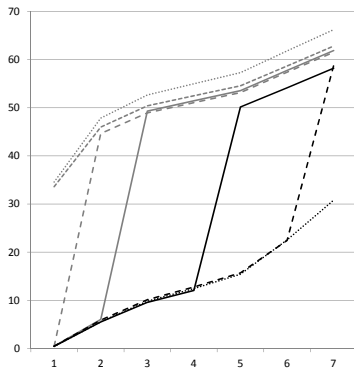
Efficiency



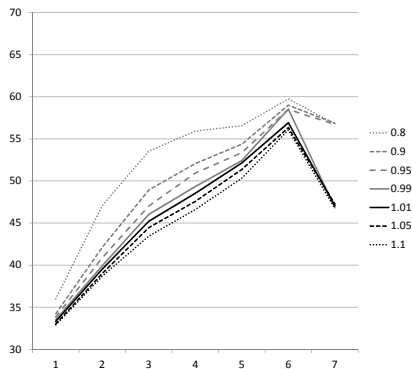
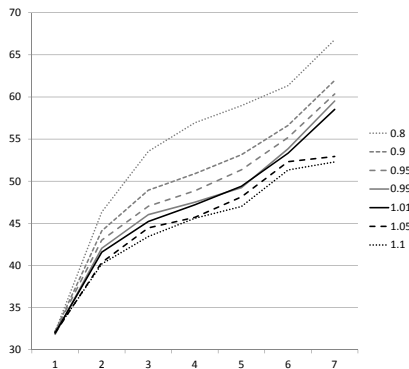
If couples cooperated, children would receive in average 70 minutes more per day of childcare from their parents.

Comparative statics: wage gap (cooperative model)

What is the effect of closing the gender wage gap on childcare?



Comparative statics: wage gap (semi-cooperative)



Conclusion

Looking at corner solutions is important

Lack of commitment \rightarrow non-cooperative choices on childcare

Childcare decisions are inefficient: efficiency would increase the total amount of care supplied by 80%.

Less efficiency but more equity among households?

Further Research

Complementarity in the production of child quality between parents

Two steps non cooperative framework

What is behind the theoretical heterogeneity generated by the semi-cooperative model?