

Free Childcare and its Effects on Families

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Motivation

Female labor supply

- Important, esp. in aging societies
- Affordable childcare crucial (Attanasio et al., AER)

Early childhood education

- Crucial for success later in life
- Possible market failure (child cannot make parents invest)
- Important for equality of opportunity

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German context

- Germany spends a lot on family policy
- Many measures with often contradictory incentives
- Example: home care subsidy but also investment in public childcare

Research Question

“Free” Daycare Slots

- Adopted by 9 states in West Germany
- All 9 states adopt free daycare for last childcare year
- 3 states offer more comprehensive policies
- Political discussion stressed **equity concerns**
- Average monthly price of daycare: around 90 euros
- Public expenditures: 89 Mio Euros in RP in 2011 (0.5% of state budget)

→ How does it affect:
childcare arrangements, maternal labor supply and children?

Who Adopts Policy?

Introduction

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	Age Group Affected	Year Adopted	State of Adoption
Last Year of Public Daycare	Ages 5-6	2000	Saarland
		2007	Rhineland-Palatinate
		2007	Berlin
		2007	Lower Saxony
		2008	Hesse
		2009	Hamburg
		2009-2010	Schleswig-Holstein
		2011	North-Rhine Westphalia
2nd Year of Public Daycare	Ages 4-5	2013	Bavaria
1st Year of Public Daycare	Ages 3-4	2008	Rhineland-Palatinate
		2010	Berlin
		2014	Hamburg
Public Childcare (pre-K)	Ages 2-3	2009	Rhineland-Palatinate
		2011	Berlin
		2014	Hamburg
No Change in Policy	All ages	2010	Rhineland-Palatinate
		2014	Hamburg
			Baden-Württemberg
			Bremen

Contributions to Literature

Childcare Prices and Female Labor Supply

- Older literature (e.g. Heckman, 1974; Ribar, 1995)
- More recently: childcare subsidies (Blau and Terkin, 2007)
- Home care subsidy: Gathmann and Sass (2018)
 - Policy reduces childcare prices to 0

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Availability of Childcare and Female Labor Supply

- Many studies (e.g. Cascio, 2009; Gelbach, 2002; Lefebvre & Merrigan, 2008; Havnes & Mogstad, 2011)
- Legal claim to daycare: Bauernschuster & Schlotter (2015)
 - Estimates vary depending on child age and family type

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Childcare and Child Outcomes

- Positive effect of center-based care (Datta Gupta & Simonson, 2010; Felfe & Lalive, 2018; Cornelissen et al., 2018)
- Reform in Quebec (Baker et al., 2008)
→ New evidence of free daycare on whole family

Mechanisms

Distinguish two Cases:

- **Families who would send child to daycare anyway**
 - Free daycare = pure income effect
 - ↓ labor supply?
 - Informal care ↑ or ↓: complement or substitute?
 - ↑ other goods and services (books, zoo visit etc.)
 - Possible benefits for child development

Mechanisms

Distinguish two Cases:

- **Families who would send child to daycare anyway**
 - Free daycare = **pure income effect**
 - ↓ labor supply?
 - Informal care ↑ or ↓: complement or substitute?
 - ↑ other goods and services (books, zoo visit etc.)
 - Possible benefits for child development
- **Families who would otherwise not send child to daycare**
 - Free daycare policy = **reduction in price for daycare**
 - Makes public daycare more attractive
 - Fixed costs of work ↓: increase in labor supply
 - Informal care ↑ or ↓: complement or substitute?
 - Effect on child development ↑ or ↓?

Expected Effects

... on Average?

- 83% of children aged 2-6 attend daycare in pre-policy period (2000-06)
- First case (mainly income effect) more important
- Expect few effects on maternal labor supply

... for different Age Groups?

- 97% of children aged 5-6 attend last daycare year (2000-06)
→ mostly income effect
- 33% of children aged 2-3 attend daycare (2000-06)
→ income and substitution effects, in particular changes in daycare arrangement

Childcare Market in Germany

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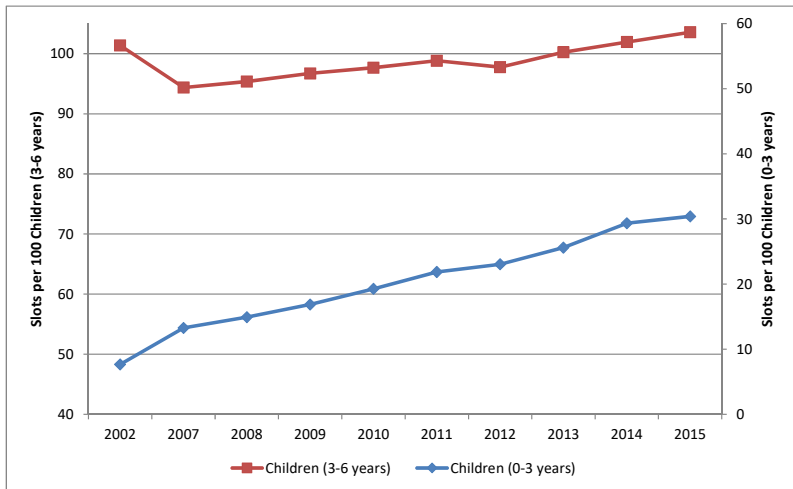
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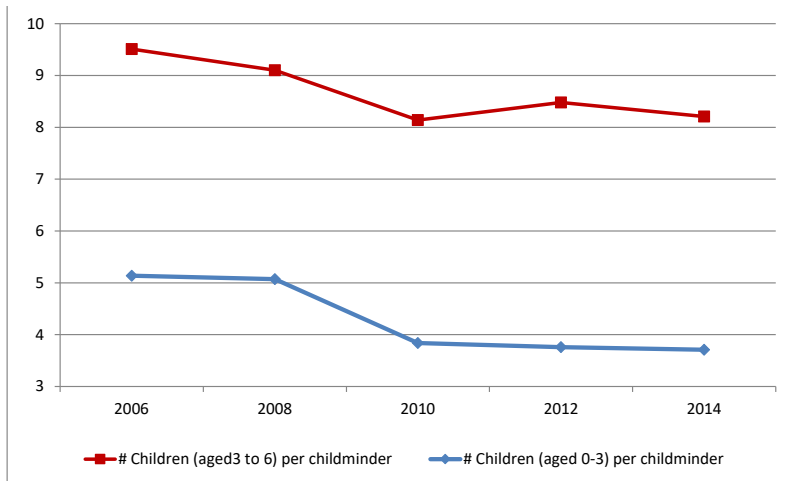
- Public daycare: provided by municipalities (1/3) or non-profit providers (2/3)
- Parental fees **only 14 % of variable costs**
- Fees set by municipalities (children, income)
- On average: **90 euros per month** (SOEP, NEPS)
- Intermediate in terms of public expenditures (above average in OECD, slightly below EU average)
- **Strict regulation of facility** (space, hygiene) and staff
- **High educational qualifications of staff** (90% of group leaders trained as educators)
- If violated, permit and public subsidies may be revoked

Expansion of Daycare Slots



→ 100% for 3-6 yrs-old, expansion for 0-3 yrs-old

Change in Daycare "Quality"



→ Expansion does not lead to decline in quality

Socio-Economic Panel (2000-2015)

- Families with preschool children (ages 2-6)
- Focus on West Germany incl. Berlin
- About 1,500 observations per year
- Childcare arrangement: public daycare, informal care, exclusive care at home (binary)
- Labor supply choices
- Information on childcare arrangements of siblings

► Summary

Supplementary Questionnaires on Child Skills

- Vineland Adaptive Behavior (ages 2-3) since 2005
 - Language skills
 - Motor skills
 - Social skills
 - Skills in daily activities
- Strength & Difficulties Quest. (ages 5-6) since 2008
 - Emotional and Conduct Problems
 - Hyperactivity, Inattention
 - Peer relationship
 - Pro-social behavior (extra)

→ Standardize: 0 mean, sd of 1 in our sample

Estimation for All Age Groups

Stacked Difference-in-Differences Approach

$$Y_{iacs} = \beta * Eligible_{acs} + \lambda' X_{iacs} + \alpha_s * \nu_a + \theta_c * \mu_a + \varepsilon_{iacs} \quad (1)$$

Eligible_{acs}: Child's broad age group and birth cohort eligible for free daycare in state

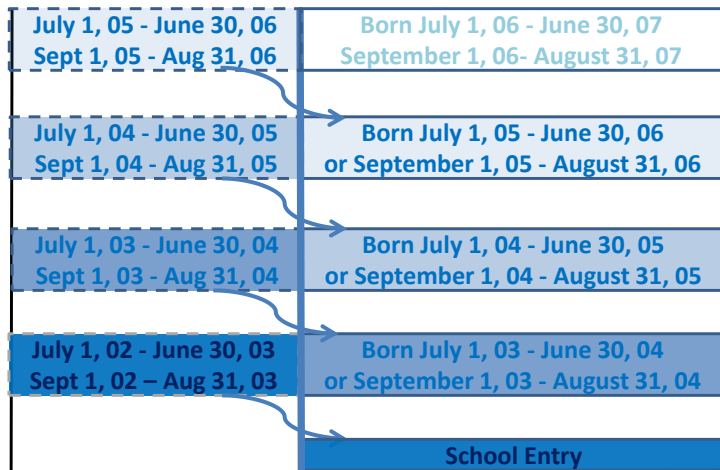
Controls:

- Birth Cohort FE (recentered: school entry rules)
- State FE
- Birth Cohort*Age group FE
- State*Broad Age group FE
- Child, parental and household controls
- State unemployment rate and GDP per capita

Example: Eligibility

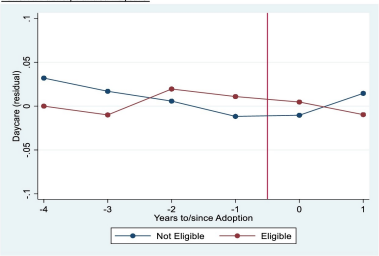
Schoolyear 2008/2009

Schoolyear 2009/2010

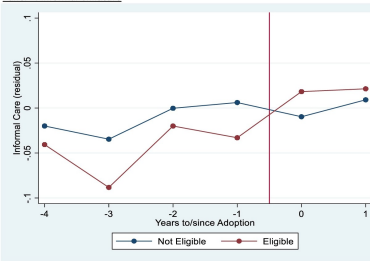
January
2009August
2009July
2010

Childcare & Female LFP

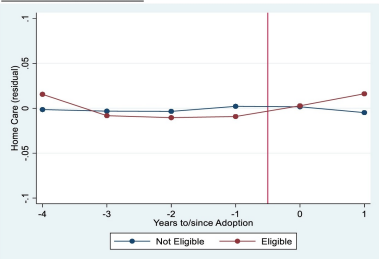
Panel A: Publicly Funded Daycare



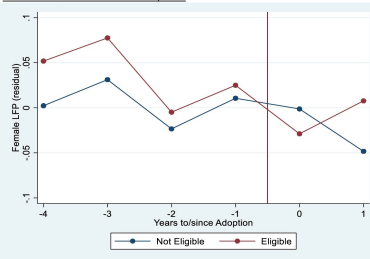
Panel B: Informal Childcare



Panel C: Exclusive Care at Home



Panel D: Female Labor Force Participation



Free Daycare and Attendance

	<u>Public Daycare</u>	<u>Informal Childcare</u>	<u>Exclusive Care at Home</u>
	Ages 5-6	Ages 5-6	Ages 5-6
	(1)	(2)	(3)
Eligible for Free Daycare	-0.011 [0.012]	0.011 [0.018]	0.004 [0.011]
Birth Cohort Fixed Effects	Yes	Yes	Yes
State Fixed Effects	Yes	Yes	Yes
Parental Controls	Yes	Yes	Yes
Household Controls	Yes	Yes	Yes
Observations	2,910	2,789	2,768
R Squared	0.031	0.074	0.035
Mean Dependent Variable (in the pre-policy period, 2000-2006)	0.969	0.357	0.017

→ No effect on attendance for older children

Free Daycare for Younger Children

	<u>Public Daycare</u>		<u>Informal Childcare</u>		<u>Exclusive Childcare at Home</u>	
	Ages 2-6		Ages 2-6		Ages 2-6	
	(1)	(2)	(3)	(4)	(5)	(6)
Eligible for Free Daycare	0.015 [0.022]	0.077* [0.039]	0.047** [0.015]	0.072** [0.025]	-0.015 [0.019]	-0.072* [0.034]
Eligible*Ages 3-4		-0.100** [0.031]		-0.007 [0.034]		0.091** [0.030]
Eligible*Ages 4-5		-0.061* [0.031]		-0.014 [0.026]		0.047* [0.026]
Eligible*Ages 5-6		-0.081 [0.049]		-0.058 [0.033]		0.077* [0.038]
Birth Cohort Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
State Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Broad Age Group Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
State*Broad Age Group FE	Yes	Yes	Yes	Yes	Yes	Yes
Birth Cohort * Broad Age Group FE	Yes	Yes	Yes	Yes	Yes	Yes
Parental Controls	Yes	Yes	Yes	Yes	Yes	Yes
Household Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	17,928	17,928	16,998	16,998	16,998	16,998
R Squared	0.351	0.351	0.068	0.068	0.205	0.206
Mean of Dependent Variable (in the pre-policy period 2000-2006)	0.711	0.711	0.4082	0.408	0.160	0.160

→ Increase in informal care (19%)

→ Shift to public daycare for youngest children (16%)

Maternal Labor Supply

	<u>Labor Force Participation</u>		<u>Work Full-time</u>		<u>Actual Hours Worked</u>	
	Ages 2-6		Ages 2-6		Ages 2-6	
	(1)	(2)	(3)	(4)	(5)	(6)
Mother of Eligible Child	0.001 [0.020]	0.073** [0.026]	0.025 [0.019]	0.045* [0.024]	0.037 [0.912]	-1.720** [0.723]
Eligible*Broad Age Group 3-4		-0.055 [0.047]		-0.077** [0.031]		1.520*** [0.432]
Eligible*Broad Age Group 4-5		-0.100** [0.042]		0.059* [0.028]		2.024 [1.294]
Eligible*Broad Age Group 5-6		-0.114** [0.040]		-0.042 [0.028]		2.568* [1.206]
School Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
State Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Parental Controls	Yes	Yes	Yes	Yes	Yes	Yes
Household Controls	Yes	Yes	Yes	Yes	Yes	Yes
Child Age (3-month intervals)	Yes	Yes	Yes	Yes	Yes	Yes
Interview Month Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Daycare Year Fixed Effects	No	Yes	Yes	No	Yes	Yes
Observations	18,225	18,225	9,796	9,796	9,575	9,575
R Squared	0.163	0.163	0.072	0.073	0.118	0.118
Mean of Dependent Variable (in the pre-policy period 2000-2006)	0.460	0.460	0.178	0.178	21.507	21.507

→ No effect on LS on average

→ Increase in LFP and fulltime for youngest children (16%)

Child Skills: Vineland & SDQ

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	2-3 Year-old Children Cognitive/Noncognitive Skills (Vineland Scale) (1)		5-6 Year-old Children Behavioral Problems (SDQ Score) (2)
Vineland Adaptive Behavior Scale	-0.073* [0.034]	Strengths and Difficulties Questionnaire (SDQ Score)	0.007 [0.071]
Motor Skills	-0.045 [0.026]	Conduct Problems	-0.082 [0.061]
Skills in Daily Activities	-0.145* [0.068]	Emotional Problems	-0.035 [0.116]
Language Skills	-0.062* [0.032]	Problems with Peers	0.011 [0.097]
Social Skills	-0.009 [0.029]	Attention Problems	0.069 [0.074]
Observations	5,488	Observations	2,386

→ Slightly negative effects for young, no effect for older children

Heterogeneity of Effects

	<u>Public Daycare</u>	<u>Informal Childcare</u>	<u>Childcare at Home</u>	<u>Female LFP</u>	<u>Child Outcomes</u>	
	Ages 2-6	Ages 2-6	Ages 2-6	Ages 2-6	Ages 2-3	Ages 5-6
	(1)	(2)	(3)	(4)	(5)	(6)
Eligible Child	0.002 [0.018]	0.039 [0.025]	-0.001 [0.016]	0.022 [0.017]	-0.211** [0.073]	0.023 [0.073]
Eligible Child*Low-skilled HH	0.056*** [0.014]	0.002 [0.027]	-0.080*** [0.019]	-0.052 [0.032]	0.387*** [0.024]	-0.092 [0.146]
Eligible Child	0.002 [0.017]	0.030 [0.020]	-0.001 [0.014]	0.015 [0.020]	-0.163** [0.063]	0.020 [0.071]
Eligible Child*Poor Household	0.081*** [0.012]	0.054 [0.037]	-0.106*** [0.011]	-0.038 [0.025]	0.233*** [0.057]	-0.069 [0.145]
Eligible Child	0.015 [0.016]	0.036 [0.020]	-0.018 [0.013]	0.015 [0.017]	-0.144** [0.057]	0.022 [0.070]
Eligible Child*Single Parent	-0.017 [0.018]	0.023 [0.049]	0.010 [0.013]	-0.034 [0.023]	0.167*** [0.042]	-0.077 [0.123]

→ Daycare ↑ for vulnerable subgroups with benefits for children

Robustness

- **Placebo Reforms**

- Reforms in t-2, t-4, t-6

► Placebo

- **Robustness**

- Control for age and interview month
- Focus on comprehensive reforms only
- Estimate cumulative effect (No. years eligible)
- Control for supply of daycare slots in district

► Robust

- **Alternative Estimates of Standard Errors**

► Std.Errors

Effect of free public daycare:

- ↑ daycare for youngest children
- ↑ informal care for most children
 - Policy mainly an income transfer to families
- Some effects on maternal labor supply
- Some (temporary) negative effects on child skills
- Stronger daycare responses for poor and low-skilled households
- Children benefit
 - Policy levels playing field

Discussion

Female LS Response

- No effect for mothers with older children (LFP: 0.54%)
- No effect for vulnerable subgroups
- Why? Other constraints or preferences?

Longer-run Effects?

- No Anticipation effects (on children not yet eligible)
- Might change women's career choices in the LR
→ Dynamic influence of policy

Backup Slides

Adoption Decision

What explains the adoption of a free daycare policy?

- Demand-driven: **past female labor supply** (+)
- Does the **supply of daycare slots** matter? (+)
- Political discussion stressed equity concerns
→ more related to **left-wing governments**? (+)
- Other influences: **Local (economic) conditions**? (+)

Adoption Decision

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	Adopt Free Childcare Policy (9 out of 11 states)			Adopt Comprehensive Reform (3 out of 11 states)	
	(1)	(2)	(3)	(4)	(5)
Unemployment Rate (%)	-0.229*** [0.052]	-0.230*** [0.052]	-0.248*** [0.056]	-0.119** [0.058]	-0.120** [0.058]
GDP per capita (Euros)	-0.000 [0.000]	-0.000 [0.000]	-0.000 [0.000]	-0.000 [0.000]	-0.000 [0.000]
State Population (in 100,000)	-0.133*** [0.035]	-0.132*** [0.035]	-0.170*** [0.038]	-0.086** [0.038]	-0.086** [0.038]
Share Medium-Skilled Employees	0.090 [0.054]	0.092* [0.055]	0.03 [0.088]	0.078 [0.050]	0.080 [0.051]
Share High-Skilled Employees	0.120** [0.055]	0.117** [0.056]	0.066 [0.075]	0.084 [0.053]	0.080 [0.054]
Conservative Vote Share in State Elections (%)	0.011* [0.006]	0.012* [0.006]	0.005 [0.006]	0.003 [0.007]	0.003 [0.007]
Left-Wing Vote Share in State Elections (%)	0.025*** [0.007]	0.025*** [0.008]	0.018** [0.008]	0.016* [0.009]	0.017* [0.009]
Women in Workforce (%)		-0.019 [0.066]	0.070 [0.077]		-0.024 [0.073]
Slots for Children aged 3-6 (per 100 children)			0.014** [0.006]		
Slots for Children under 3 (per 100 children)			0.021 [0.015]		
State Fixed Effects	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes
Observations	135	135	122	146	145

Summary Statistics

	<u>Pre-Policy Period</u>		<u>Post-Policy Period</u>	
	(2000-2006)		(2007-2015)	
	Mean	Std. Dev.	Mean	Std. Dev.
Childcare Attendance	0.714	0.452	0.817	0.387
Full-time Attendance	0.207	0.405	0.030	0.171
Informal Childcare	0.402	0.490	0.331	0.471
Exclusive Care at Home	0.158	0.365	0.119	0.324
Maternal Employment	0.460	0.498	0.542	0.498
Full-time Work	0.177	0.382	0.180	0.385
Actual Hours of Work	21.50	12.38	23.44	12.33
Child is a Girl	0.493	0.500	0.483	0.500
Age of Child	4.38	1.24	4.24	1.28
Household Size	4.10	1.11	4.28	1.19
Number of Children	2.10	0.901	2.32	1.07
Infants under age 1 in Household	0.025	0.157	0.052	0.223
Age of Mother	34.13	5.18	35.28	5.69
Mother Low-Skilled	0.193	0.395	0.180	0.384
Mother Medium-skilled	0.646	0.478	0.558	0.497
Mother High-skilled	0.144	0.351	0.227	0.419
Single Mother	0.068	0.252	0.113	0.316
Mother Married	0.882	0.323	0.839	0.367
Mother Divorced/Widowed	0.050	0.217	0.048	0.214
Foreign Mother	0.168	0.374	0.161	0.368
Unemployment Rate	8.314	2.364	6.420	2.260
GDP per capita (Euros)	28754.7	4248.3	36	5

Maternal Assessments Reliable?

	Vineland Adaptive Behavior Scale			Strengths and Difficulties Questionnaire		
	(1)	(2)	(3)	(4)	(5)	(6)
Professional Childcare (relative to Informal Care)	0.134*** [0.031]			-0.138* [0.065]		
Mainly Professional Care (more than Informal Care)		0.136*** [0.020]			-0.132** [0.051]	
Informal Childcare			0.048** [0.019]			-0.004 [0.051]
Professional Childcare			0.175*** [0.027]			-0.015 [0.054]
Child is a Girl	0.216*** [0.023]	0.220*** [0.023]	0.198*** [0.021]	-0.303*** [0.038]	-0.310*** [0.038]	-0.305*** [0.049]
Mother's Age	-0.007** [0.003]	-0.008** [0.003]	-0.007*** [0.002]	-0.010** [0.004]	-0.010** [0.004]	-0.013*** [0.004]
Mother Medium-skilled	0.085 [0.048]	0.079* [0.043]	0.084* [0.042]	-0.181** [0.064]	-0.183** [0.069]	-0.215** [0.078]
Mother High-skilled	0.082 [0.048]	0.084 [0.050]	0.079* [0.042]	-0.342*** [0.086]	-0.359*** [0.091]	-0.375*** [0.087]
Mother in School	0.118* [0.062]	0.114 [0.065]	0.109* [0.055]	-0.363** [0.122]	-0.371** [0.125]	-0.397** [0.153]

Other controls: marital status of mother, household size and income, migrant household, number of children, newborn child

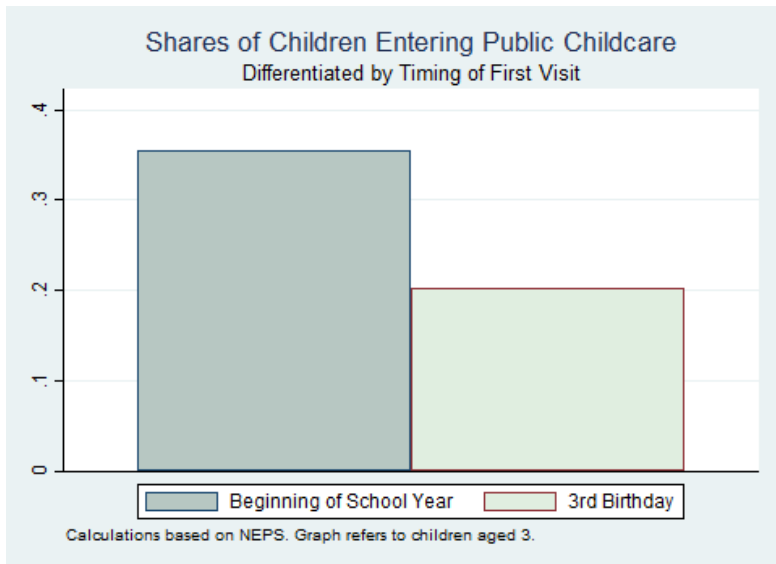
Entry into Daycare by Child Age

Shares of Children Entering Public Childcare
Differentiated by Age of First Visit



Calculations based on NEPS.

Entry into Daycare at Age 3



Placebo Reforms

	<u>Public Daycare</u>			<u>Informal Childcare</u>			<u>Exclusive Care at Home</u>		
	Placebo (t-2)	Placebo (t-4)	Placebo (t-6)	Placebo (t-2)	Placebo (t-4)	Placebo (t-6)	Placebo (t-2)	Placebo (t-4)	Placebo (t-6)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Placebo Free Daycare	0.032 [0.028]	-0.002 [0.032]	0.003 [0.038]	-0.051 [0.087]	-0.066 [0.047]	-0.019 [0.054]	0.003 [0.032]	0.028 [0.047]	-0.001 [0.038]
Placebo* Ages 3-4	-0.024 [0.028]	0.021 [0.022]	0.021 [0.019]	0.086 [0.105]	0.006 [0.062]	0.102 [0.083]	-0.022 [0.043]	-0.050 [0.052]	-0.001 [0.038]
Placebo* Ages 4-5	-0.036 [0.025]	0.018 [0.017]	0.017 [0.029]	0.086 [0.084]	0.011 [0.071]	0.128** [0.050]	0.002 [0.035]	-0.034 [0.048]	0.001 [0.038]
Placebo* Ages 5-6	-0.029 [0.037]	0.026 [0.030]	0.046 [0.040]	0.020 [0.093]	-0.004 [0.050]	0.067 [0.060]	0.005 [0.036]	-0.023 [0.049]	-0.001 [0.038]

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Alternative Specifications

	<u>Public Daycare</u>		<u>Informal Childcare</u>		<u>Childcare at Home</u>		<u>Female LFP</u>	
	Ages 5-6 (1)	Ages 2-5 (2)	Ages 5-6 (3)	Ages 2-5 (4)	Ages 5-6 (5)	Ages 2-5 (6)	Ages 5-6 (7)	Ages 2-5 (8)
Control for Child Age and Interview Month	-0.013 [0.012]	0.015 [0.016]	0.011 [0.017]	0.068*** [0.014]	0.007 [0.012]	-0.020 [0.018]	-0.040 [0.031]	0.000 [0.000]
Comprehensive Reforms Only		0.024 [0.031]		0.066*** [0.014]		-0.025 [0.025]		0.000 [0.000]
Cumulate # Years Eligible		0.023*** [0.007]		0.018* [0.009]		-0.015** [0.006]		0.000 [0.000]
Control for Supply of Daycare Slots	0.003 [0.007]	0.024*** [0.006]	0.001 [0.018]	0.015 [0.013]	0.001 [0.008]	-0.014** [0.006]	-0.002 [0.042]	0.000 [0.000]

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Spillover Effects on Siblings

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Strategy

Results

Discussion

Appendix
Tables

	<u>Public Daycare</u>	<u>Informal Care</u>	<u>Childcare at Home</u>
	All Ages (1)	All Ages (2)	All Ages (3)
Spillover on Sibling of Treated Child	0.096** [0.031]	0.015 [0.073]	-0.052* [0.025]
Spillover* Ages 3-4	-0.102** [0.045]	0.030 [0.066]	0.056* [0.027]
Spillover* Ages 4-5	-0.104*** [0.031]	0.002 [0.066]	0.058** [0.021]
Spillover* Ages 5-6	-0.165** [0.061]	-0.110* [0.053]	0.122 [0.068]
Birth Cohort Fixed Effects	Yes	Yes	Yes
State Fixed Effects	Yes	Yes	Yes
Broad Age Group Fixed Effects	Yes	Yes	Yes
State*Broad Age Group FE	Yes	Yes	Yes
Birth Cohort * Broad Age Group FE	Yes	Yes	Yes
Parental Controls	Yes	Yes	Yes
Household Controls	Yes	Yes	Yes
Observations	12,623	11,597	11,627
R Squared	0.343	0.064	0.196

Alternative Estimators for Standard Errors

	Public Daycare		Informal Childcare		Childcare at Home		Female LFP	
	Ages 5-6 (1)	Ages 2-5 (2)	Ages 5-6 (3)	Ages 2-5 (4)	Ages 5-6 (5)	Ages 2-5 (6)	Ages 5-6 (7)	Ages 2-5 (8)
Baseline Estimates (from Table 2-4)	-0.004 [0.006] 3,895 0.037	0.023*** [0.007] 16,827 0.299	0.010 [0.021] 3,744 0.078	0.018* [0.009] 15,939 0.066	0.003 [0.007] 3,703 0.040	-0.015** [0.006] 15,989 0.182	-0.006 [0.032] 3,931 0.177	0.004 [0.010] 17,090 0.170
State and Year Cluster	-0.004 [0.010] 3,895 0.037	0.023*** [0.007] 16,827 0.299	0.010 [0.023] 3,744 0.078	0.018* [0.010] 15,939 0.066	0.003 [0.008] 3,703 0.040	-0.015*** [0.005] 15,989 0.182	-0.006 [0.025] 3,931 0.177	0.004 [0.007] 17,090 0.170
State and Pre-/Post Policy Cluster	-0.004 [0.006] 3,895 0.037	0.023* [0.011] 16,827 0.299	0.010 [0.018] 3,744 0.078	0.018** [0.008] 15,939 0.066	0.003 [0.007] 3,703 0.040	-0.015** [0.007] 15,989 0.182	-0.006 [0.026] 3,931 0.177	0.004 [0.010] 17,090 0.170
Wild Bootstrap	-0.001 [-0.011; 0.009] 0.86	0.036 [0.016; 0.059] 0.03	0.003 [-0.032; 0.042] 0.99	0.004 [-0.024; 0.037] 0.83	-0.0002 [-0.013; 0.011] 0.98	-0.023 [-0.044; -0.002] 0.07	-0.007 [-0.057; 0.042] 0.89	-0.013 [-0.038; 0.013] 0.45

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