

**The Impact of Early Center-Based Childcare Attendance on Early Child Development: Evidence from France;** *Lawrence Berger (University of Wisconsin – Madison), Lidia Panico (French National Institut for Demographic Studies - Ined), Anne Solaz (Ined)*

While early childcare and education have been increasingly championed by policy makers as a way to increase female labor force participation and fertility, mixed evidence is found on the effects of attending center-based childcare on child development. A rich literature has attempted to study this question, with mixed results. On average, studies show that attendance to quality early childhood programs is linked with better cognitive development (Belsky et al. 2007) and improved school readiness, particularly for children from more disadvantaged background (Campbell et al. 2001). However, some studies have also reported negative associations, particularly in terms of child behavior and for children attending low quality programs and/or attending for long hours.

Attempting to isolate a causal impact of childcare on child outcomes is difficult because of the heterogeneity in the quality of care provided, the difficulty in measuring this quality, and systematic selection into different types and qualities of care arrangements. In this paper, we explore whether early attendance in center-based care settings has an impact on subsequent child development, using French birth-cohort data. The French context is particularly suited to explore this question as the quality of center-based care is considered to be high and relatively homogeneous within the country: the majority of children attending center-based care are placed within high-quality, state-funded and state-controlled nurseries. We propose a causal framework to determine whether attendance to center-based care at 1 year of age has an impact on three different spheres of child development (early language, motor development, and behavior) one year later, using a recent, large, nationally representative cohort study of children born in France. To do so, we use an instrumental variables (IV) approach, which harnesses exogenous variation in center-based care participation based on local availability of such care.

### **Data and measures**

We use newly available data from the *Etude Longitudinale Française depuis l'Enfance* (Elfe), a population-based longitudinal birth cohort study that follows over 18,000 children from the time of their birth in 2011. Children were born at a randomly selected sample of 341 hospitals located throughout continental France. Interviews were carried out shortly after birth, and when the child was about 2 months, 1, and 2 years of age. The study is ongoing, and collects data on a diverse number of topics including socio-economic background, parenting, child development, and living conditions. Our analyses employ 11841 observations collected from caregiver interviews on childcare at about 1 year of age and on child outcomes at 2 years. Our analytic sample is children not primarily looked after by a parent at 1 year (and in some form of childcare arrangement) and included in the two-year old wave.

Our **key variable of interest** is the primary type of childcare at 1 year of age. We categorize children according to the childcare setting including center-based care (*crèche*), individual care at the home of the child (nanny), semi-individual care of up to three children at the home of the care provider (childminder or *assistante maternelle*), or informal care provided by grandparents, friends, or neighbors. Like formal center-based care, childminders in France also receive quality checks from the state, and their salary is subsidized, in a similar framework to *crèche* system. At one year of age, 34% of the children were mainly

looked after by a parent, 41% by a childminder, 16.5% in a crèche (n=2018), 4.5% by grandparents, 2% by a nanny at the child's home<sup>1</sup>.

We focus on **three developmental outcomes**. We use a validated tool to measure early language development, the MacArthur–Bates inventory, implemented when children were about 2 years of age; the short French version is used, as previously validated (Kern et al., 2010). The Inventory measures the size and variety of children's vocabularies, the information is collected from the primary caregiver (usually the mother), who reports whether the child uses specific words from a list of one hundred words. A higher score therefore indicates a larger vocabulary. For motor development, we construct a score from seven variables indicating the child's ability to perform different activities at 2 years, as reported by the parent: walking up stairs, kicking a ball, running, cycling with a tricycle, eating alone, drinking alone. We also use a variable indicating whether the child can walk independently by 18 months, the upper age limits considered as “normal development” by the WHO (WHO, 2006). To construct the score, we use the coordinates of individuals on the first axis of a principle component analysis. The first axis explains 79% of the inertia of the point cloud, indicating a good correlation between the variables. A higher score indicates a more advanced motor development. To look at child behavior, we construct a score from three variables, also reported by the main caregiver. The variables indicate how often, on a five-point scale going from never to always, the child: resists what the main care giver suggests; challenges or defies the main caregiver when he is reprimanded; hits the caregiver or destroys things when he is angry with them. A higher score indicates more problematic behaviors.

Child age at the two-year data collection ranges from 23 months to 28 months. Because child age at interview might impact their development scores, and because there may be a link between child age and the difficulty in setting up the parental interviews (and hence the socio-economic profile of the household), all outcomes are standardized according to the age of the child in months at the time of the survey, then normalized to facilitate interpretation and comparison.

## Results

Descriptive analyses show that children attending crèche have the highest (best) mean language scores, followed by those looked after by a nanny and childminder. Those mainly looked after by their parents have the lowest scores. For motor development, although differences are not significant, children attending crèche still report the best scores, followed by those looked after by their parents and grandparents, while those looked after through individual formal care appear to report worse scores. A reverse trend is observable for child behavior (that is, children attending crèche appear to have worse behaviors), although the differences are not statistically significant.

The advantage of children attending group care is confirmed when we implement linear regression models, where we test the impact of the primary mode of childcare at 1 year of age on language development at 2 years, controlling for the child's parity, family structure at 1 year, maternal education, maternal migrant status, the highest professional category in the household, and household total income at 1 year. Our results

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<sup>1</sup> Only 17% of children changed primary arrangement between 1 and 2 years, with parental care becoming less prevalent, and the use of a crèche becoming more prevalent (21% of children used a crèche as a main mode of childcare at age 2, n=2667).

(Table 1) show that children attending crèche have language scores that are 0.21 standard deviations higher than the rest of the children (model 1). This result is robust to different sample inclusion criteria: children attending crèche have higher language scores when compared to children in parental care (0.31 standard deviations, model 2). If we restrict the sample to children for whom both parents are employed, children attending crèche have higher language scores than all other children (0.19 standard deviations, model 3), including those in some form on non-parental care (0.15 standard deviations, model 4), or in individual formal care (0.14 standard deviations, model 5). Similar results are reported for motor development, although the advantage of children in crèche relative to those in parental care is of smaller magnitude than for language skills. For child behavior, a reverse trend is observed, with children attending crèche reporting the most behavioral difficulties.

These differences could be driven by unobserved differences in households who choose, or are able to access, crèche over other types of childcare arrangements. While we can control for different observed parental and household characteristics, households might also differ on unobserved characteristics such as parental values, which may explain the higher language scores of children attending crèche. To identify a causal impact, we implement an instrumental variables approach to estimate the unbiased effect of crèche participation on child development. We use as an instrument the availability of crèche places estimated by a variable indicating the local proportion of crèche places per one hundred 0 to 3 year-old children living in the municipality. The results for the full sample (Table 1) show that the advantage for children attending a crèche is still evident but results are more mitigated. First, while children attending crèche are confirmed to have better language scores than those looked after by a parent or informally, there are no significant differences from those in a formal individual care arrangement. On the other hand, while results are less likely to be statistically significant than in the OLS models, children attending crèche appear to have better motor development than all other children, including those in other formal arrangements. Finally, the association of crèche with poorer child behavior suggested is confirmed by IV models, with children attending crèche reporting more behavioral difficulties than peers in parental, informal or individual formal care arrangements.

Because household and parent characteristics could modify these associations, a number of subgroup analyses are carried out. First, children of less educated mothers appear to benefit more from the language advantage conferred by crèche attendance than those of less educated mothers. For motor development, the size of the coefficients does not show a clear relationship with maternal education. Second, children of immigrant mothers who attend crèche appear to benefit more than children of French-born mothers in terms of language development. Finally, interesting differences by gender appear: girls appear to benefit more in terms of motor skills, while boys benefit more in terms of their language development.

**Table 1: OLS and IV Results for full sample**

LANGUAGE	(1)	(2)	(3)	(4)	(5)
	vs all other CC	vs Parent	vs all other care working mother	vs external care working mother	vs Nanny working mother
<b>OLS</b>					
creche	0.207*** (0.026)	0.309*** (0.036)	0.187*** (0.026)	0.155*** (0.025)	0.143*** (0.025)
<b>IV 2 instruments</b>					
creche	0.294* (0.149)	0.327 (0.239)	0.344** (0.130)	0.240* (0.110)	0.174+ (0.102)
F-Test	195	66	199	205	221
<b>IV local only</b>					
creche	0.191 (0.151)	0.253 (0.215)	0.207 (0.133)	0.131 (0.112)	0.087 (0.103)
F-Test	372	129	376	387	423
N	11,876	6,038	9,334	7,264	6,673
<b>MOTOR SKILLS</b>					
<b>OLS</b>					
creche	0.130*** (0.027)	0.142*** (0.036)	0.129*** (0.028)	0.145*** (0.028)	0.137*** (0.028)
<b>IV 2 instruments</b>					
creche	0.569*** (0.153)	1.017*** (0.269)	0.329* (0.135)	0.251* (0.119)	0.421*** (0.114)
F-Test	178	53	186	191	205
<b>IV local only</b>					
creche	0.675*** (0.160)	0.957*** (0.239)	0.390** (0.142)	0.323** (0.125)	0.431*** (0.117)
F-Test	341	104	354	362	392
N	11,087	5,565	8,806	6,890	6,346
<b>BEHAVIOR</b>					
<b>OLS</b>					
creche	-0.111*** (0.027)	-0.101** (0.037)	-0.125*** (0.026)	-0.106*** (0.026)	-0.105*** (0.026)
<b>IV 2 instruments</b>					
creche	-0.313* (0.156)	-0.127 (0.254)	-0.522*** (0.136)	-0.549*** (0.118)	-0.490*** (0.109)
F-Test	195	67	199	206	222
<b>IV local only</b>					
creche	-0.257+ (0.154)	-0.086 (0.222)	-0.426** (0.134)	-0.452*** (0.116)	-0.408*** (0.108)
F-Test	372	129	376	387	423
N	11,873	6,035	9,331	7,263	6,672

+ p<.10, \* p<.05, \*\* p<.01, \*\*\* p<.001

## Conclusion

Using an instrumental variable approach, we find that attending center-based care at 1 year of age is positively associated with language and motor skills development a year later, and negatively associated with child behavior. We use data from France, where there is a diversity of childcare arrangements for children under 3 years of age, but also where the quality of center-based care provided through a system

of state-run crèches is considered high and relatively homogeneous. Subgroup analyses suggest that these impacts vary across the population: children of less educated mothers appear to benefit in particular of attending formal group care, suggesting that these policies might be effective tools for reducing early social inequalities.

## **Bibliography**

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