



Does early child care affect children's development? ☆

Christina Felfe^{a,b}, Rafael Lalive^{b,c,d,e,f,*}

^a University of St. Gallen, Varnbüelstrasse 14, St. Gallen CH-9000, Switzerland

^b CESifo, Germany

^c Department of Economics, University of Lausanne, Lausanne-Dorigny CH-1015, Switzerland

^d CEPR, United States

^e NBER, United States

^f IZA, Germany



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ABSTRACT

We study how early child care (ECC) affects children's development in a marginal treatment effect framework that allows for rich forms of observed and unobserved effect heterogeneity. Exploiting a reform in Germany that induced school districts to expand ECC at different points in time, we find strong but diverging effects on children's motor and socio-emotional skills. Children who were most likely to attend ECC benefit in terms of their motor skill development. Children who were least likely to attend ECC gain in terms of their socio-emotional skill development, especially boys and children from disadvantaged families, such as those with low education or migration backgrounds. Simulating expansions of ECC, we find that a moderate expansion fosters motor skills for all children and language skills for boys and immigrant children. A progressive expansion of ECC improves all children's socio-emotional development but neither their motor skills nor their language skills.

1. Introduction

In light of the rapidly increasing demand for early child care (ECC) – care offered to children under the age of 3 – many countries have placed reforms to the ECC system high up on their political agenda. However, whether ECC helps or hinders children's development is hotly debated by politicians and scholars alike. ECC provides stimulating environments in which children meet other children on a regular basis and are cared for by certified pedagogical staff. However, these staff might not be able to devote sufficient attention to each child, particularly not to children with special needs.

Our aim is to assess whether ECC affects children's development and how expanding ECC supply affects children who occupy newly created slots. To answer these questions, we adopt a marginal treatment effect

(MTE) framework that provides information on how the ECC effect varies across children in terms of their observable characteristics and in terms of their latent propensity to attend ECC. In our context, a child's latent propensity to attend ECC likely depends on both parents' preferences to send their child to ECC and constraints, e.g., features of the rationing system that allocates slots to children. The MTE framework is well suited to capture the full range of ECC effects and can be used to simulate effects of alternative reforms to the ECC system and thus to generate important and policy-relevant information.

We study ECC in Schleswig-Holstein, the northernmost German state that features excess demand for ECC: in 2005, 36% of all parents sought to place their child in ECC, while only 7% could be accommodated. From 2005 onward, German authorities channeled substantial funding into school districts to expand ECC. The expansion

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* Corresponding author at: Department of Economics, University of Lausanne, CH-1015 Lausanne-Dorigny, Switzerland.

E-mail addresses: Christina.Felfe@unisg.ch (C. Felfe), Rafael.Lalive@unil.ch (R. Lalive).

process initially occurred unevenly across school districts. Two years after the reform, some districts offered an ECC slot to 25% of all children – henceforth called fast-expansion districts – while other districts offered a slot to only 5% – the slow-expansion districts. Four years after the reform, however, all districts were able to accommodate approximately 25% of all children. Hence, the timing of the expansion, but not the targeted level of ECC slots, differed across fast- and slow-expansion districts.

While not random, the variation in the timing of the expansion is plausibly exogenous. The fact that the targeted level of ECC does not differ between fast- and slow-expansion districts is consistent with this claim. There are no pre-reform differences between fast- and slow-expansion districts in child development or socio-demographic aspects. The exception is the number of children aged 0–2, one of the criteria determining the order according to which funding was distributed across districts. Socio-demographics and care center quality follow similar trends in fast- and slow-expansion districts. We are also unaware of any other policy change during the period under study that may have differentially affected fast- and slow-expansion districts.

Official records from school entry examinations (SEE) – mandatory medical assessments of children just before they enter primary school – provide information on language, motor, and socio-emotional skills. For our analysis, we use SEE data on 6 cohorts, 2 born before the reform and 4 born after the reform. In a first step, we estimate the individual probability of being enrolled in ECC – the propensity score. The propensity score model contains a set of interaction terms that capture the plausibly exogenous change in ECC attendance triggered by the 2005 reform. In a second step, we estimate how child development varies with the propensity score. The resulting estimates ultimately allow us to produce estimates of the MTEs.

The results indicate a weak effect of ECC on language skills. We observe positive effects of ECC on children's motor and socio-emotional skills. The patterns, however, differ across these two skill dimensions. Effects on motor skills are strong for children with a high latent propensity, but significantly lower for children with a low latent propensity to attend ECC. The pattern for children's socio-emotional skills is exactly the opposite: while children with a low latent propensity exhibit significant gains in this skill dimension, children with a high latent propensity benefit substantially, but not statistically significantly, less from attending ECC. The differential patterns observed for motor and socio-emotional skills could be due to differences in the underlying skill production functions: motor skills are the explicit target of the ECC curricula and can be fostered using playful activities that both centers and parents can provide equally; socio-emotional skills, in turn, are shaped primarily by adult and peer relationships (Ladd, 2005), which are readily available in centers but not necessarily to the caregiver at home.

How ECC expansions affect children who occupy the new slots is a central policy question. Based on our MTE results, we simulate two alternative policy scenarios. In the first scenario, we simulate the effects of the ECC expansion that occurred between the first cohort and the last cohort in our data. This expansion increases average ECC attendance from 7% to 27%, a “modest” expansion. In the second scenario, we simulate what would happen if all school districts expanded ECC as much as the strongly expanding districts did in our observation period, those at the 90th decile of the distribution of ECC expansions in our data. This “progressive” reform implies an increase in ECC attendance to 50%, up from the current 27%.

Overall, we find that expanding ECC improves the motor skill development of the average child and that a moderate reform exerts stronger effects than a progressive reform. A progressive reform stimulates moreover the socio-emotional skill development of the average child. Examining sub-groups, we find that boys benefit considerably

more from ECC expansions than girls: a moderate reform stimulates boys' language and motor skills, while a progressive reform stimulates their motor and socio-emotional skills. Girls benefit only in terms of their motor skills in the modest expansion, but not in the progressive expansion. Effects by education and migration background suggest that a modest expansion fosters the motor skills of all children, independently of their socio-demographic background. In addition, the modest expansion helps improve immigrant children's language skills and thus points to the leveling effects of ECC. A progressive expansion promotes the socio-emotional development of disadvantaged children, both children from a low education background and children with migrant ancestry. This result highlights the relevance of expanding the ECC supply because expansion could provide access to children whose parents may underestimate the benefits of ECC.

Two main strands of the literature discuss how child care affects children's development. The first strand investigates the effects of universally accessible child care on children's skill acquisition. Most studies focus on preschool-age children (3–6 years old) and generally find neutral or positive effects (Berlinski et al., 2009; Cascio, 2009; Felfe et al., 2015; Fitzpatrick, 2008; Gormley Jr. et al., 2008; Havnes and Mogstad, 2011; Magnuson et al., 2007). Research on the effects of non-parental care on younger children (0–2 years old – the age range on which we focus) is less abundant and inconclusive. Several studies find negative effects on children's development. Focusing on the Canadian province of Québec, Baker et al. (2008) find that reducing the out-of-pocket cost of public child care increases its use but crowds out existing private care arrangements. While stimulating maternal employment, the subsidy leads to more negative parenting styles, resulting in a deterioration of child well-being. Exploiting the summer dip in child care utilization as an instrument for attendance, Herbst (2013) finds negative effects of non-parental care arrangements on children's cognitive test scores. A recent study for Italy by Fort et al. (2017) confirms the negative effects of non-parental care arrangements on intellectual strength, particularly for girls. What these studies have in common is the relatively low quality of center-based care in comparison to the quality of the counterfactual care mode (i.e., home care or private child care arrangements). In contrast, studies focusing on countries with high-quality, center-based care come to a more positive conclusion. In the context of Denmark, Datta-Gupta and Simonsen (2010) find that children benefit more from center-based care than from lower-quality informal day care. Furthermore, in Chile, center-based care targeted at children aged 5–14 months carries substantial benefits, particularly in terms of motor and cognitive skills (Noboa Hidalgo and Urzúa, 2012). Drange and Havnes (2014) exploit child care assignment lotteries in Norway and identify a positive effect of starting child care, on average, four months earlier (at 15 months instead of at 19 months) on children's medium-run cognitive skills.

Another strand of literature dealing with very young children is the literature on the effects of maternal employment on child development. This strand of the literature is relevant for our study, as center-based care represents the main care mode for working mothers. Maternal employment can improve children's intellectual performance by increasing household income (Blau and Grossberg, 1992), but it may also negatively affect it (Baum, 2003; James-Burdumy, 2005), depending on the family's background (see Ruhm, 2004 and Brooks-Gunn et al., 2002 for an overview). Several recent studies exploit changes in time spent with parents due to reforms of the length of parental leave to assess the role of time with parents for children's long-term development. Wuertz-Rasmussen (2010), Liu and Skans (2010), Baker and Milligan (2012), and Dustmann and Schoenberg (2012) find no effects, whereas Carneiro et al. (2014) and Danzer and Lavy (forthcoming) detect some positive long-term effects on education and labor market outcomes.

We complement the literature adopting an MTE framework that allows for differences in the average treatment effect along observed dimensions and along the individual latent propensity to be treated. The MTE approach is useful to understand and predict the effects of

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