

The effect of public child care attendance on child development – Evidence from a large expansion in pre-primary education

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-Extended abstract-

This paper evaluates the effect of a large expansion in universal pre-primary child care on child development at the time of school entry in Germany.

By 1998, after a phase-in period, parents were granted a legal claim for a institutional child care slot for every child between the age of three and six years. This led to a large increase in the provision of child care slots. At the same time there was a considerable increase in the attendance of institutional child care, mainly along the intensive margin. On average, the share of children attending for 3 years increased from about 38% (in 1994) to nearly 60% (in 2001). The increase was even stronger for ethnic minorities, of which the main groups are Turkish, Ethnic Germans from the former USSR and Yugoslavs. This increase was different across municipalities over time.

In this paper, we analyse the effect of exposure to child care on child achievements at the start of the schooling period. Our analysis is based on a unique administrative data set, which covers the entire population, and reports results from the school entry examination. This is compulsory for all children. We analyse data for Lower Saxony, one of Germany's federal states. The data we use covers all examination cohorts between 1994 to 2002. For each child we observe the physician administered developmental outcomes and recommendations as well as ethnicity, gender and postcode of the municipality of residence, month of birth and date of examination as well as the duration of institutionalised child care attendance until start of school. The nature of the data allows us to estimate the causal effect of **duration** - in contrast to the effect of sheer attendance - of child care attendance on child development and the effect of child care attendance for subgroups.

In order to address the problem of non-random selection into non-compulsory pre-primary education we exploit differences in the increases in child care slots across areas due to the new legislation. This allows us to identify the effect of prolonged

child care attendance on developmental outcomes, like motor skills and language development. We use changes in municipality-level attendance, which can be seen as a measure of supply increases in the presence of rationing of places. Our approach is similar to instrumenting the individual Kindergarten attendance with municipality-cohort interactions, which has been employed in the literature (for instance by Dobbie and Fryer (2009) and by Joyce (1999)). In the presence of heterogeneous effects to child care attendance the estimated effect measures the Local Average Treatment Effect; the mean return to child care attendance of individuals starting child care earlier in response to an increase in supply due to the introduction of the legal claim.

Results suggest that longer child care attendance has a positive effect on non-cognitive skills for German children: We find significant negative effects on the likelihood of having fine and gross motor skill problems, as well as on the physician's recommendation of compensatory exercise. The results seem to be solely driven by girls. For boys we observe a small negative effect on the likelihood of being deferred from school entry for an additional year. For ethnic minority children we find strong positive effects of longer child care attendance on their German language ability as well as a strong negative effect on the likelihood of being deferred. Both effects do not vary by gender. We further find a positive effect on fine motor skills for foreign children, which is driven by girls and comparable in magnitude to the effect found for German children.

These results remain unchanged when we add time-varying economic and socio-demographic municipality-specific variables or municipality specific linear time trends.

We further do a placebo test exploiting the variation in the attendance of a preventive medical screening at the age of 10-12 months, which is positively correlated with individual preschool attendance. A statistically significant effect of the child care reform on children's likelihood of attending the examination, which takes place before child care entry, would therefore raise concern about omitted variables bias and potential policy endogeneity. Using the screening attendance as a placebo outcome, the estimated coefficients on municipality level attendance are close to zero and statistically insignificant at conventional levels.

To investigate whether the differential expansion of child care attendance across municipalities is due to the reform and independent of the characteristics of the children that were affected or transitory municipality-level shocks, we regress changes in municipality level attendance on changes of time-varying socio-economic and demographic conditions. Only changes in the number of inhabitants in the municipality show a statistically significant negative coefficient, whereas the coefficients on all other socio-economic variables, such as shifts in the wage and educational distribution within the municipality, are small and statistically insignificant. This gives us confidence, that supply is not affected by transitory changes on municipality level, which might affect children's outcomes independently.

Our results provide evidence for a positive effect of an increase in child care attendance on children's motor skills; for foreign children, we find a positive effect on language capacity. In contrast to existing studies, we are also able to assess whether there are heterogeneous returns for girls and boys. This finding is in line with existing evidence; for instance, Datta - Gupta and Simonsen (2010) find even negative effects of family day care on non-cognitive skills for boys in contrast to mostly positive returns for girls in Denmark. In his analysis of three early US interventions Anderson (2008) finds treatment effects on late life outcomes to be positive for females and modest or non-existent for males.