

## **Social Inequality, Child Care Attendance, and School Start in Germany**

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### **Abstract**

This study investigates how far attending child care institutions can reduce delayed school entries in Germany. The influence of child care institutions should be stronger when children attend them at younger ages, and it should vary according to the children's social origins. When parents' cultural resources are low, care institutions should have large additional positive effects on children's development. The empirical analysis of over 1,100 children and their parents taking part in the Socio-Economic Panel Study (SOEP) showed compensatory effects of early child care attendance that enabled children with low-educated parents to avoid delayed school entry at Age 6.

*JEL Classification: I21, H0*

### **1. Introduction**

In recent years, educational research has made major progress in explaining and testing models on educational choice (Stocké, 2007) and in developing models that take a life-course perspective (Shavit/Blossfeld, 1993). Performance gains and educational careers are cumulative processes that either restrict or enhance the path of learning along with further participation in formal learning contexts. Therefore, current research is concentrating increasingly on early childhood education and its long-term effects (Gormley/Gayer, 2005; Heckman/Masterov, 2007).

In Germany, some findings indicate that children attending child care institutions over a longer period of time perform better on both psychological tests and special tests assessing readiness for school entry (Schöler et al., 2004). Moreover, delayed school entry correlates with lower future chances of transferring to an academic secondary school track (Bellenberg/Klemm, 1998). Because it is evident that differences in educational careers already emerge during early childhood, policymakers are discussing whether more investment

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in child care institutions might help to reduce the social inequalities in the German education system.

In our article, we investigate the impact of early child care attendance on avoiding delayed school entrance in Germany. We focus on whether it has positive effects for children with lower support potentials in their home environment. We shall start by describing previous findings and the reasons why institutionalized forms of child care in early childhood influence the time point of school entry. Then we shall describe our sample based on the German Socio-Economic Panel Study (SOEP) and the operationalization of the study. The results presented in the fourth section indicate that child care attendance has a positive impact, especially for children from disadvantaged families. Finally, we shall sum up our findings and make recommendations for reforms to preschool education that could help to counter the strong relationship between social origins and children's opportunities in the educational system.

## 2. Theories on the Impact of Child Care Institutions on Children's Development

In Germany, attendance of child care institutions is voluntary and, in most cases, subject to fees. Generally, children enter them at the age of 3 years, but there is also a proportion of children who do not attend before the ages of 4 or 5, as well as some who never attend at all. The most common child care institution for 3- to 6-year-olds is the so-called *Kindergarten*. Care institutions for children below Age 3 have a somewhat different form and are called *Kinderkrippe*. Due to divergent historical developments, institutional child care before age 3 is more common in East Germany than in the West.

The age at which children enter these care institutions varies according to parents' socio-economic resources and migration background: Parents with a low-income, low-qualified, and/or immigrant background tend to register their children at care institutions at an older age (4 or 5 years) or do not send them at all (Konsortium Bildungsberichterstattung, 2006). Studies on educational attainment and student assessment indicate that this group of children also performs less well (Bos et al., 2007; Schneider, 2008). Further studies report positive correlations between the duration of child care attendance and educational participation or test performance, thus indicating possible long-term consequences of Kindergarten attendance for school achievement (Bos et al., 2007; Büchner / Spiess, 2007). However, these positive correlations might be caused by a positive selection of children attending child care institutions at Age 3 or even earlier, although no skills are required for admittance to them.

Research on school readiness and school achievement has shown that success depends not only on academic skills in, for instance, literacy or vocabu-

lary but also on skills in social-emotional domains like power of concentration or self-regulation. Although the home environment is most important for the development of these skills, there is evidence that early child care institutions also foster them through stimulating interactions with teachers and peers (Pianta, 2002).

A further research field focuses on the influence of the quality of child care institutions, such as the quality of teacher-child interaction, the educational orientations of the teachers, the structural environment, or the social composition of the children within the Kindergarten group. Good quality in these areas leads to better cognitive, verbal, and social skills that persist until elementary school admission (Biedinger et al., 2008; Tietze et al., 2005). Furthermore, experimental studies in the United States have shown that long-term positive effects of high-quality preschool education could still be seen even at Age 40 (Heckman / Masterov, 2007).

Unlike early child care, the school system has compulsory regulations on the age of entry. Until 2004, compulsory schooling started on August 1<sup>st</sup> in all German federal states for every child reaching the age of 6 between July 1<sup>st</sup> of the previous and June 30<sup>th</sup> of the current calendar year. However, these regulations have been modified in some federal states during recent years, and they have not been the same across Germany since 2005.

There is also no uniform procedure on how to diagnose school readiness in Germany. In most federal states, children are tested by physicians when they reach regular school entry age. Although physicians give a recommendation, however, in most federal states, it is the principal of the elementary school who decides whether school entry should be delayed (Rossbach 2001). When these professionals anticipate that a child will be unable to fulfill the requirements of elementary school due to insufficient intellectual, social, and/or emotional development, he or she is held back for one more school year and, thus, has a delayed school entry. Between the years 1999 and 2004, this procedure was applied to about 5 to 7% of each (birth) cohort (Konsortium Bildungsberichterstattung 2006, 43–44).

School entrance tests in Brandenburg revealed that socially disadvantaged children had a higher risk of skill deficits in different cognitive domains (Elsässer, 1998). From a sociological perspective, the ‘transmission of cultural capital’ (Bourdieu 1997) contributes to these social class differences. The most important indicator of cultural capital and home environment is the parents’ educational attainment. *Therefore, we expect more highly educated families will provide their children with better support and stimulation, thereby reducing the risk of delayed school entry (Hypothesis 1).*

A higher risk of delayed school entry has also been reported for children with a migration background (Tischler et al., 2002). Because German-language skills are seen as one crucial reason for these differences, *we expect*

*children who have few contacts with the language of their host country to face a higher risk of delayed school entry (Hypothesis 2).*

Few empirical studies in Germany have addressed the role of institutional child care attendance in the development of children and their later school success. It is assumed that trained Kindergarten staff positively stimulate the development of school-related skills, and that exposure to a peer group might influence the children's socialization process. However, both influences probably depend on how long children attend such an institution. *Consequently, we expect that early entry into child care institutions at Age 2 or 3 will provide an additional period in a stimulating environment outside the family that fosters development and decreases the probability of delayed school entry (Hypothesis 3).*

Because German child care institutions are not intended to serve as some sort of preschool, children with a demanding and stimulating home environment might profit only slightly or even not at all from attending them. However, children with minor support and aid resources in the family should benefit more from child care institutions. *Thus, we expect compensatory effects for children from more disadvantaged families (Hypothesis 4).*

### 3. Data and Operationalization

The empirical analysis is based on data from the German Socio-Economic Panel (SOEP) (Wagner et al., 2007). These panel data distinguish between attendance in child care institutions and the employment of a child minder. We included the panel waves since 1995. Thus, the oldest children in our sample were born in July 1992, and we could observe whether they were already attending a child care institution at Age 2.<sup>1</sup> Starting in the school year 2005/06, some federal states have changed the regular age of school entry. Therefore we restricted our sample to children born at the latest in June 1998. For the children in our sample, obligatory school attendance started between 1999/2000 and 2004/05.<sup>2</sup> This resulted in a sample of 1,114 children who were observed annually from Age 2 to 7.

As an indicator of family environment and particularly parents' cultural capital, we relied on their highest educational degree. When parents had different levels of education, we chose the highest. This variable originally con-

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<sup>1</sup> SOEP does not ask for the age at entry into child care institutions. We assumed that entry took place at the beginning of the current school year (i.e., in September of the last calendar year, since data were collected in winter and spring throughout the panel waves).

<sup>2</sup> We also excluded children with an early school entry before their 6<sup>th</sup> birthday. These children were already attending school and, thus, no longer faced the risk of being held back.

tained values between 7 and 18 years corresponding to the typical duration needed to reach one's highest academic level. In our analysis, the variable was mean centered. Migration background was measured by mother's level of subjectively rated German-language skills. We distinguished between mothers with good and low language skills. The reference group was German natives.

The third hypothesis addresses the influence of age at entry in child care institution on delayed school start. Using three dummy variables, we differentiated between entering a child care institution at Age 2, 3, or later (including never at all). To test the fourth hypothesis, we computed interaction effects between parents' education and age at entry.

We also controlled for further variables: Although all children of regular school admission age are 6 years old in Germany, the difference between the youngest and the oldest is 11 months. Because skill development in this age group is still highly age-sensitive, older children should tend to possess better school-related skills and, therefore, also start school at the regular age more often. To take this into account, we entered the logarithm of the birth month in the multivariate models. Furthermore, we took account of the year of obligatory school enrolment, because official data indicate that there has been a slight decrease in delayed school entry over the years. The values of this variable ranged from 0 for school year 1999/2000 to 6 for 2004/05. We also used dummy variables to control for East-West differences within Germany and gender differences.

Because the dependent variable is binary (delayed school entry = 1, regular entry = 0), we estimated logistic regression models (Greene, 2000, 811–826).

#### 4. Results

In all logistic regression models, we controlled for age, gender, year of compulsory schooling, and East versus West Germany (see Table 1). The significant negative effect of birth month indicated that younger children, born in May or June of the current year, faced a higher risk of delayed school entry than older ones born in July of the previous year. In all models, boys faced a higher risk of delayed school entry than girls. The negative and highly significant coefficient for year of compulsory school admission replicated official data reporting a decrease in delayed school entries over time.

Turning to our hypotheses, Model 2 (Table 1) was expanded by information on parents' highest educational attainment. The negative significant coefficient supported Hypothesis 1, which predicted that more highly educated families would have better opportunities to support their children, resulting in higher skill levels and higher rates of being evaluated as ready for school.

Model 3 included German-language skills and revealed that children had a higher risk of delayed school entry when their mothers were immigrants and reported low German-language skills. However, when migrant mothers rated their language skills as good, the child did not face a higher risk than native Germans.

*Table 1*  
**Logit Models on the risk of delayed school entry (robust standard error)**

	Model 1	Model 2	Model 3	Model 4	Model 5
Parents' highest education (mean centered)		-0.111 (0.048)*	-0.089 (0.048) <sup>+</sup>	-0.084 (0.048) <sup>+</sup>	-0.237 (0.100)*
Mothers language skills ( <i>Ref. native</i> )					
(very) good			0.128 (0.323)	0.023 (0.319)	-0.011 (0.319)
low			0.724 (0.343)*	0.673 (0.335)*	0.689 (0.338)*
Child care institution attendance ( <i>Ref. later than age 3 or never at all</i> )					
at age 2				-0.787 (0.325)*	-0.854 (0.344)*
at age 3				-0.724 (0.236)**	-0.810 (0.247)**
Interaction					
Parents' education*child care at age 2					0.183 (0.144)
Parents' education*child care at age 3					0.212 (0.113) <sup>+</sup>
Age / Distance to the cutoff point (June = ln(1), May = ln(2), . . . , July = ln(12))	-0.564 (0.134)**	-0.571 (0.135)**	-0.553 (0.133)**	-0.545 (0.132)**	-0.541 (0.134)**
Boy ( <i>Ref. girl</i> )	0.405 (0.211) <sup>+</sup>	0.449 (0.215)*	0.449 (0.215)*	0.435 (0.215)*	0.436 (0.214)*
Compulsory schooling (1999 = 0)	-0.171 (0.056)**	-0.163 (0.056)**	-0.155 (0.057)**	-0.137 (0.056)*	-0.140 (0.056)*
East Germany ( <i>Ref. West Germany</i> )	0.380 (0.261)	0.380 (0.262)	0.500 (0.271) <sup>+</sup>	0.592 (0.279)*	0.598 (0.279)*
Constant	-1.229 (0.290)**	-1.164 (0.286)**	-1.343 (0.298)**	-0.854 (0.348)*	-0.817 (0.353)*
Number of cases	1112	1112	1112	1112	1112
Loglik	-339.95	-336.52	-334.33	-329.37	-327.32
Pseudo R <sup>2</sup> (McFadden)	0.047	0.056	0.063	0.076	0.082

Source: SOEP, sample A–F, wave 1995–2004, own calculations.

Standard errors are corrected by the Huber Sandwich Estimator, because more than one child was observed in some families.

\*\*  $p < 0.01$  \*  $p < 0.05$  +  $p < 0.1$ .

Model 4 included the age at entry into a child care institution. Children who started attending Kindergarten at Age 2 or 3 had a lower risk of delayed school enrolment compared to children who began later than Age 3 or never at all. The negative coefficients for these groups were significant, thus supporting Hypothesis 3. The coefficients for children entering at Age 2 or 3 were similar in size, and taking the standard errors into account, the difference did not attain statistical significance.

According to Hypothesis 4, a longer attendance at child care institutions should particularly accelerate the process of becoming ready for school in children from low-educated families. Therefore, we included interaction effects between the highest educational attainment of the family and the age at entry into child care institutions.<sup>3</sup> The results are shown in Model 5. Whereas the main effect of child care institution attendance was nearly the same, the main effect of parents' educational attainment increased in strength. The interaction effects were only slightly smaller than the main effect for parents' educational level, but took different directions.<sup>4</sup> Apparently, differences in social origin leveled out when children from low-educated families attended care institutions early in the life course.

Applying Model 5, we calculated the probabilities of delayed school entry depending on the highest educational attainment of the parents and the age at entry into child care institutions. This model was based on a child who was male, born in May 1994, and living in West Germany. The black bars in Figure 1 show the probabilities of a delayed school entry for children who started attending child care after Age 3 (or never at all). These probabilities varied according to parents' educational attainment. When children attended child care institutions at Age 3 (gray bars), there was hardly any difference due to parents' educational level. The difference in the probabilities of delayed school entry between highest and lowest educational attainment was only 5 percentage points. Furthermore, there was no difference between children who started attending child care institutions at Age 3 and those who had already started at Age 2 (white bars).

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<sup>3</sup> We also tested interaction effects between migration background and age at entry into child care institutions. These did not attain statistical significance. However, this might have been due to low case numbers.

<sup>4</sup> The interaction effect for children attending care institutions at Age 2 failed to attain significance at the 10% level. Because of the low case numbers of children with delayed school entry and the similarity to the other interaction effect (almost significant on the 5% level), we interpreted the coefficient as being substantively meaningful.

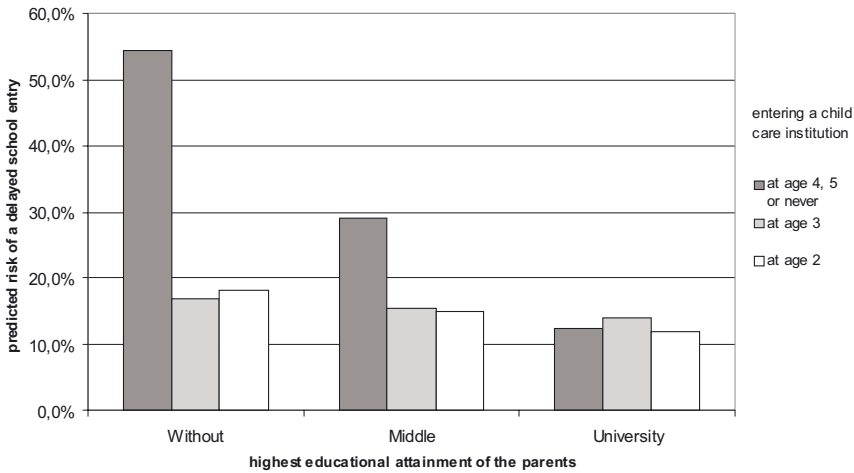


Figure 1: Predicted probabilities of delayed school entry by parents’ highest educational attainment and age of entering a child care institution<sup>1</sup>

<sup>1</sup> Calculated for a boy born in May 1994 and living in West Germany.

### 5. Discussion

Cross-national studies have shown strong correlations between social origin and school success in Germany (Shavit/Blossfeld, 1993), and the German government intends to reduce this linkage. One major topic in the current political debate is the importance of child care institutions as a resource with which to reach this goal. It is assumed that these foster the development of school-related skills, and this might be especially beneficial for children from disadvantaged families.

Our analysis shows that social disparities already exist at the beginning of school careers. Children from low-educated families have a higher risk of delayed school entry. One reason might be social differences in the development of school-related skills due to differences in the home environment. The statistical model including interaction effects (Model 5) indicates a reduction of social disparities in the risk of delayed school entry when children start attending early child care institutions by Age 3 at the latest. The risk of delayed school entry is particularly reduced for children from low-educated families. This indicates positive influences of early child care institutions. Consequently, early institutional child care might be a means of reducing social disparities in the educational system. However, children from highly educated families obviously do not benefit from the care institution in terms of school readiness, because their risk is already low.



Social policymakers are becoming increasingly aware of the importance for children's development of stimulating environments at an early age, and there has been much discussion on how deficits in the development of children can be detected and compensated in early childhood. Political discussions focus especially on children from disadvantaged families and with a migrant background. The different German federal states have introduced a variety of reforms to the regulations on institutional early childhood education addressing, for instance, the age of compulsory school entry or the introduction of obligatory screenings, especially of German-language competencies, carried out 1 or 2 years before reaching the age of compulsory school entry. There has also been a debate on whether child care institutions should be free of charge. Some federal states have already decided to offer free institutional child care attendance for the last year before schooling. However, the effectiveness of these measures is questionable. National and international research has shown the beneficial effects of early institutional support on the development of school readiness, but this support has to start early in the life course. One possible recommendation might well be to introduce free and compulsory child care attendance at Age 3.

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