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Article

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Weekly Report

Children who attend formal day care do better in school—even many years later in secondary school

Questions about the advantages and disadvantages of sending young children to formal day care ("Kindertageseinrichtungen") have always greatly concerned parents and led to intense, if not always well informed, policy debate. Two issues have been foremost. One is whether young children removed from their parents' care for part of the day suffer long term emotional consequences, or whether on the contrary, interaction with other children and with carers improves their social skills and confidence. Results are generally positive for children over three years old, but mixed for children under three, with some studies indicating negative socio-emotional consequences (Rossbach, 2005), and others reporting no negative emotional results and clear gains in social competence (Tietze, 1998; Andersson, 1989, 1992; NICHD, 2000, 2001). The second issue, dealt with in this article, relates to children's school outcome. Do children who have been to formal day care which exposes them to some pre-school learning achieve better, the same, or worse educational results in their later school years? If they do better, how long does the advantage last? Does it persist through to secondary school?

This article is based on fifteen years of evidence in SOEP, covering children born between 1984 and 1998. These children of course came from the full range of socio-economic and ethnic backgrounds found in contemporary Germany. Some went to formal day care for as long as six years, almost from birth, others went just for a year or two, and a few never went at all. Their parents continue to be interviewed in SOEP and every year they record information about their children's current education. So researchers are in a position to assess the relationship between early child care and later school achievement—even secondary school achievement.

Most previous research on the consequences of formal day care for cognitive development has relied exclusively on retrospective evidence; that is, respondents are asked to recall whether they (or their children) went to formal day care and what activities they engaged in there. Retrospective evidence is clearly subject to error, and the generally positive relationships found in previous research between formal day care attendance and subsequent educational performance might be partly due to a tendency for parents whose children have done well in school to attribute results partly to their own wise choice of formal day care. Furthermore, previous retrospective studies have generally not investigated the connection between length of time in formal day care (as distinct from attendance versus non-attendance) on

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Table 1

Places available in formal day care (places per 100 children by age group) 1982-2002

	1982	1986	1990	1994	1998	2002
Places for children under 3						
West*	1.4	1.6	1.8	2.2	2.8	4.2
East*	64.7	79.8	54.2	41.3	36.3	37.0
Total	14.4	16.8	11.2	6.3	7.0	8.6
Places for children aged 3 to 6.5						
West*	65.6	69.3	69.0	96.2	111.8	105.1
East*	91.6	93.4	97.4	73.0	86.8	89.5
Total	73.1	76.1	75.9	77.2	89.5	91.3

Notes: * West 1982-1998: West Germany with West Berlin, 2002: West Germany with Berlin as a whole; * East 1982-1998: East Germany with East Berlin, 2002: East Germany without Berlin as a whole.
 Sources: State Central Administration for Statistics: 1989 Statistical Yearbook of the German Democratic Republic, Berlin 1989, Federal Statistical Office: Statistics of the Child and Youth Aid Service – organizations and active persons, various years, Wiesbaden, compiled and calculated by the Dortmund Office of the Child and Youth Aid Statistical Agency, July 2006.

educational performance. An exception is Bos et al (2004) who found a positive association between duration of attendance and performance in reading, writing, mathematics and natural science.

We now provide some basic information about how many children go to formal day care and how long they stay there, highlighting major differences between East and West Germany. We then document the link between attending formal day care and higher socio-economic status and family incomes. Then come the main results assessing whether or not, net of all other relevant factors, length of time in formal day care results in better performance in secondary school. Finally, we consider some important policy implications of our findings.

Who goes to formal day care and for how long? East-West differences

Table 1 documents the availability of day care places for children under three, and then for children aged three to six-and-a-half. The data come from official sources and are provided separately for East and West Germany from 1982 onwards.

Far more places are available for children under three in the Eastern states. As is well known, this is a hangover from the GDR where nearly all women worked full-time and went back to work soon after

their children were born. There is a serious shortage of places for younger children in the West. The problem is slowly being addressed; viewing matters positively, there was an increase in places of 50% from 1998-2002. But it was only from 2.8 to 4.2 places per hundred children. As we shall see, this continuing shortage might have significant policy implications in that it negatively impacts on the

Table 2

Duration of care and educational experience in formal day care, children born 1984-1998

Duration (years)	% share	N
0	2.74	29
1	4.04	34
2	20.06	134
3	49.38	246
4	14.66	71
5	4.79	30
6	4.33	25
Total	100.00	569

Source: SOEP 1984-2005.

Table 3

Relationship between attending formal day care and socio-economic variables (OLS regression)

Explanatory variables ¹	coefficient	t-value
Boy	-0.05	(-0.53)
Number of siblings	-0.10	(-1.74) +
Lone mother	0.44	(1.50)
Mother German	0.30	(2.22) *
East Germany	0.43	(1.68) +
Village	-0.18	(-1.07)
Large city	-0.15	(-1.19)
Mother's age	-0.00	(-0.21)
Mother apprenticed	0.16	(1.36)
Mother attended Uni.	0.39	(1.75) +
Father apprenticed	-0.04	(-0.29)
Father attended Uni.	0.18	(0.96)
Mother: years of f/t work	0.14	(4.60) **
Mother: years of p/t work	0.08	(2.79) **
Income	0.02	(1.67) +
N	556	
Adjusted R-square	0.27	

¹ Dummy variables for year of child's birth were also included.

Significance: ** = $p < 0,01$, * = $p < 0,05$, + = $p < 0,10$

Source: SOEP.

educational opportunities of children from low SES backgrounds.

Next we summarise evidence provided by parents in SOEP about the time their children spent in formal day care. The evidence relates to 569 children born in 1984-98.

Just a few children (2.7%) never attended formal day care, while a few more, mainly in East Germany, attended for six years and so were there virtually from the time they were born until they started primary school. So the data show that, collectively, these children had the full range of possible formal day care experience; ideal for research purposes.

Children from higher SES backgrounds more likely to attend day care longer

Although the costs for formal day care are relatively low in Germany compared to other industrialised countries (for instance, low income households very often pay no fees at all) the results show that children from higher SES backgrounds are both more likely to attend in the first place, and more likely to remain there for a longer period. Table 3 reports results of an ordinary least squares (OLS) regression in the which the outcome variable is number of years spent in formal day care and the explanatory variables are various measures of social background and year of birth.

Much depends on mothers! The evidence in Table 3 makes it clear that German mothers who are well educated themselves and who worked either full-time or part-time are more likely than other mothers to send their children to formal day care. Length of time in formal day care is also associated with having a relatively high household income. Mothers from an immigrant background, and those from poorer less educated backgrounds, were less likely to have their children in day care for a lengthy period. So were mothers with several children rather than a single child. Also, as we already know, East German children attend for longer on average than their Western peers.

Time in formal day care and secondary school attainment

Our key evidence relates to whether length of time in formal day care improves secondary school attainment. To assess this, we need to control for the effects of other variables which are associated with school attainment, including parental SES, in order to gauge the *net impact of experience in formal day care*. The dependent (outcome) variable in Table 4 is whether or not these children gained entry to a *Gymnasium* or *Realschule* on the one hand, or were less scholastically successful and attended *Hauptschule*.¹

The main finding here is that, net of other relevant factors, length of time in formal day care is significantly associated with improved school attainment. Every extra year of attendance increases the probability of going to *Gymnasium* or *Realschule* by about 8 percentage points. So a child who attends for three years, which is a typical experience (see Table 2), has about a 25% better chance of attaining a higher level of education than a child who never attends.

Discussion and policy implications

The results of this research, if confirmed, have clear policy implications. At present many children from lower SES and from immigrant backgrounds do not get the opportunity to go to formal day care. This is particularly true in the Western states where there remains a serious shortage of places, especially for children under three. Given that formal day care attendance, and even more the length of time spent there, is quite strongly associated with improved performance many years later in secondary school, the current initiative by the German Government, the German states and local authorities to increase

the availability of day care for children under the age of three makes a great deal of sense.

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¹ Technically, this is a probit analysis, appropriate for a dichotomous (1-0) dependent variable.

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