



# **Children who do not attend day care: What are the implications for educational outcomes?**

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# Children who do not attend day care: What are the implications for educational outcomes?\*

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*Abstract:*

Earlier studies have shown that participation in public day care can enhance school performance especially among disadvantaged children. Child home care allowance scheme supports home care of six-year olds if they have a younger sibling who is also staying at home and not attending public day care. This study asks how Finnish six-year-olds with younger sibling(s) who stay at home perform in school when compared with children attending public day care. As outcome variables we used the two dichotomous variables measuring school performance at age 15 to 16 and entry into further education by age of 21. The study utilized birth cohort 1987 (N=7910) data. The overall results did not show statistically significant differences between the day care and home care groups. Among disadvantaged families the home care group had more often poor grades.

*Keywords:* child day care, child home care, educational outcomes, intergenerational transmission of education, disadvantaged children

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**Acknowledgement:** The research leading to these results has received funding from the European Union's Seventh Framework Programme (FP7/2007-2013) under grant agreement no. 320116 for the research project FamiliesAndSocieties.

<sup>1</sup> The research leading to these results has received funding from the European Union's Seventh Framework Programme (FP7/2007-2013) under grant agreement no. 320116 for the research project FamiliesAndSocieties. The funder had no role in study design; in the collection, analysis and interpretation of data; in the writing of the report; and in the decision to submit the article for publication. We thank Reija Paananen for contributing to the paper in the early stages of the project. We thank Ulla Hämäläinen and Anne Kouvonen for useful comments.

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## **1. Introduction**

Families with young children are faced with choice of day care arrangements after parental leave. Should one of the parents (and which one) stay at home to take care of the child or should there be some other child care arrangements involving substitute care-givers? To support mothers' labour force participation welfare states have implemented various policies for alternative care arrangements (Moss, 2012). There is a rich literature to show that conditions during the earliest childhood years are decisive for later life chances (Esping-Andersen et al., 2012). Earlier studies have shown that participation in public day care can enhance school performance especially among disadvantaged children (Blau and Currie, 2006; Currie, 2001; Ruhm, 2004).

In Finland a child home care allowance (CHCA) scheme was introduced in the mid-1980s as a way to offer an alternative support to families who did not take advantage of public child day care services while their youngest child was less than three years of age. Finland stood out among the Western welfare states and among the Nordic countries with a unique scheme to support home care of young children under the age of three (Sipilä and Korpinen, 1998). Furthermore, if the family had an older child under the formal school age (7) the support was extended through sibling supplement until the older child started in elementary school. In other words the government supported home care of children until formal school age. Other countries have also experimented with CHCA schemes for the under 3's but to our knowledge Finland is the only country where the support is extended to six-year-olds via sibling supplement (Haataja and Valaste, 2014).

The CHCA scheme has been criticized as a trap for women, since it offers an incentive for women to stay at home instead of participating at the labour market (Sipilä, 1995; Hiilamo and Kangas, 2010). This study asks if CHCA also a trap for pre-school-aged children who stay at home with one of the parents (usually mother) who takes care of a younger sibling. More specifically we are interested in how Finnish six-year-olds who stay at home perform in school when compared with children attending public day care. As outcome variables we use the two dichotomous variables measuring school performance at age 15 to 16 and entry into further education by age of 21.

In general, it appears from earlier studies that child day care arrangements do not have a large effect on child school performance on average level, but that they could make a difference for disadvantaged children. We assume that participation in public day care would not affect average school performance but would slightly improve school performance among disadvantaged children.

The remainder of the paper is organized as follows: Section 2 discusses the linkages between child day care options and child outcomes. Section 3 provides a description of the institutional set-up. Section 4 presents our empirical strategy and section 5 the study results. Finally, Section 6 concludes.

## **2. Child outcomes of care arrangements**

When hypothesizing connections between care arrangements and child outcome we assume that among other factors the stimulus and socializing patterns experienced by the children differ between home care and public day care. Intuitively school start would be easier for children who have participated in public day care. Public day care emphasizes the importance of social and non-cognitive skills, which are prerequisites for learning and success in school (Cunha and Heckman, 2006). The fact that a child is enrolled in public day care usually indicate that both parents are in employment, which increase family income and the spending on goods consumed by the child compared to families where one of the parents stays at home. That has also bearing on child outcomes (Cooksey, Joshi and Verropoulou, 2009).

It is clear from earlier research that high quality child day care during the preschool years yield substantial benefits in terms of school readiness, educational attainment, health and social integration (Esping-Andersen et al., 2012). Reviews of studies on child development and non-parental care (Brilli, Del Boca and Monfardni, 2013; Blau and Currie, 2006; Currie, 2001; Ruhm, 2004) show positive effects of public child day care participation especially for disadvantaged children. Participation in day care supports early non-cognitive skills, that are found to affect both schooling outcomes (and thereby indirectly labour outcomes) and the likelihood of teenage pregnancy and smoking, and the level of earnings (Heckman et al., 2006). However, most of the studies concentrate on targeted programs such as Head Start, Early Head Start, Perry Preschool and The Early Training Project in the US. It is questionable to extrapolate from the findings on disadvantaged children to a regime with universal care

programs. Universal programs are offered to the entire population, not only to disadvantaged groups. Universal day care programs also entail quality control not typical of targeted programs.

There are a few studies with mixed results about the effects of regimes with universal or large-scale day care programs such as the Nordic ones. Gupta and Simonsen (2010) found in Denmark that compared to home care, being enrolled in preschool did not lead to significant differences in non-cognitive child outcomes at age seven, regardless of gender or the mother's level of education. Esping-Andersen et al. (2012) found that in Denmark enrolment in high-quality formal care at age three was associated with higher cognitive scores at age eleven, and with larger effects for the lowest-income children. By utilizing large regional differences in the spread of quality care Germany Felfe and Lalive (2011) showed that high-quality centre-based care promotes child development both in terms of cognitive and non-cognitive skills. Havnes and Mogstad (2014) studied the effects of a 1975 Norwegian policy introducing basically universal kindergarten coverage. They concluded that universal coverage had positive effects in terms of later earnings for children from low income and low educated families but not for children from other family types. An earlier paper by the same authors showed that the reform increasing preschool availability on had a positive effect on years of education and college attendance (Havnes and Mogstad, 2011).

### **3. Institutional context**

The data for this study is derived from Birth Cohort 1987, which is a longitudinal cohort study of all Finnish children born in 1987 (Paananen and Gissler, 2012). Children in the birth cohort 1987 started school in 1994 when they turned seven, which means they would have started preschool in the autumn of 1993. We concentrate on describing the institutional context of child home care and day care options in the early 1990s.

The conflicting views on the effects of child day care arrangements for child well-being are reflected in the two-track development of policies to support the care of small children in Finland. A national Child Home Care Act was established in 1985, and came completely into force in 1990. Until 1989, the duration of payment of CHCAs depended on the number of small children in the family, but from 1990 all parents of children under three years received the allowance. The allowance was paid to the parents or guardians whose child under 3 years

of age was not in municipal day care. CHCA could be used to pay for private day care but it was very seldom used for that purpose, partially due to double taxation. Instead the families take CHCA as a payment for care input of the parent (usually mother) who stays at home with the child. A crucial step in the transition towards wider utilisation of CHCA system came with the February 1985 amendment to the Contracts of Employment Act, entitling employees to extend their leave after the termination of the parental allowance period, when the child is about 9 months of age, until the child turns three (Haataja, 2005).

A crucial step in the development of public day care system in Finland was taken in 1985, when the subjective right to day care was extended to all children under the age of three, to take effect from the beginning of 1990. Finland was the first country in the world to issue a guarantee for public day care (Anttonen and Sipilä, 2000: 128). However, the municipalities lagged far behind the national plans to arrange child day care places to meet the demand due to increasing female labour force participation (Berqvist et al., 1999;). To decrease the demand for public day care the municipalities started to pay additional municipal CHCA bonuses in order to encourage families not to use their right to day care (Hiilamo, 2002).

Public child day care in Finland consists of two options (private day care plays a marginal role in Finland, Moss, 2012). Side by side with running day care centres the municipalities also arrange family day care, which takes place in private homes. The municipalities approve the facilities and the qualifications of the child minder. The parents pay for family day care according to same fee schedule as in day care centres. Before 2000 municipalities were responsible for arranging discretionary preschool activities for those children who were to start primary school the following autumn. Free-of-charge preschool system for six-year-olds was not implemented before 2000.

Trained personnel provide the public day care. The qualification of a kindergarten teacher is a university or university of applied sciences degree. All day-care centre personnel must have at least an upper secondary-level qualification in social welfare and health care. One in three day-care personnel must be a qualified kindergarten teacher, i.e. have a lower tertiary degree. Child minders are required a vocational qualification in family day care or other appropriate training. The staff to child ratio is four for children under the age of three or seven for children over the age of three. Child minders are allowed to care for up to four children including their own children who are under school age on a full-day basis as well as for one

preschool or school-age child on a part-day basis (Ministry of Social Affairs and Health, 2013).

Since the implementation of subjective right for child day care the day care regime has been strongly affected by changes in political and economic climate. A deep economic recession hit Finland in the beginning of the 1990s and practically eliminated demand for labour (Kalela et al., 2002; Haataja, 2005). The unemployment climbed to record-peak of around 20 per cent. The recession coincided with the Centre Party led coalition government. The Centre Party (previously Agrarian Party) had been promoting CHCA since the very beginning as a substitute for public day care, which was not used by agrarian mothers. While cutting other social benefits the government raised the statutory CHCA to a record high level (Sipilä and Korpinen, 1998; Haataja, 2005) with the peak in 1993. In 1993 the net replacement rate of CHCA was 60 per cent of average female wage (Haataja, 2005).

As consequence of economic recession and high benefit level, the CHCA became very popular in the early 1990s (Sipilä and Korpinen, 1998). As many as 70 per cent of all children under three years received CHCA, while 21 per cent were in public day care (9 per cent were without support due to parental or sickness allowance, unemployment benefits or private arrangements). Mothers without jobs were understandably more interested in cash than in putting their children in public day care. The CHCA option was especially lucrative to low-income families, who were entitled to means-tested CHCA supplement on top of basic allowance. Before 1992 basic CHCA was paid on top of unemployment benefit, but since 1993 the CHCA was deducted from unemployment benefit. After the reform families with one unemployed parent started claiming CHCA for the employed parent.

The Finnish CHCA scheme also offers a widely used opportunity to receive support for their older pre-school-aged children. The support is granted as a sibling supplement, which is 20 per cent of the basic amount. In 1993 around 160,000 or 78.2 per cent children received CHCA, and 35 per cent of them were siblings between 3-6 years of age (Kela, 1994).

#### **4. Data and methods**

Using Birth cohort 1987 (N=59,068) data for this study offers two advantages. Firstly, children born in 1987 were the last birth cohort without subjective right to public day care.



Secondly, when the cohort members turned six years the CHCA reached its peak level together with high unemployment. There was a huge incentive for cohort member parents with a younger sibling to use CHCA instead of public day care.

The present cohort data are linked to highly reliable administrative registers providing us with crucial life-course information about the cohort members and background information about their parents. We merged the original cohort data with the Social Insurance Institution (SII) benefit register on CHCA, parental benefits and unemployment benefits.

We restricted our analysis only to those 1987 cohort members who were alive in Dec 31, 1993 and whose parents were also alive and not divorced (Figure 1). Single parenthood effects both the use of child day care options and school outcomes. To reduce selection bias the analysis was restricted to two parent families.

There is no register data available on child day care utilization; statistics are collected at municipal level only from the last day of each year. Instead we have to use an alternative strategy for identification. Our strategy is based on SII register data on CHCA, which is available since 1993. To gain information of six-year-olds in home care we looked into cohort members' younger siblings between one and two years. We focused on younger siblings due to the fact that there is no support for six-year-olds if they do not have younger siblings entitled to CHCA. There were 7910 cohort members with a younger sibling between 1 and 2 years, but no siblings younger than 1 year (i.e. family did not receive parental benefits). The group was identified with the help of SII CHCA and parental benefit registers. However, the register was not available before and after 1993. That means that we have no information if the cohort member has been previously on CHCA.

The cohort members' sibling entitled the parents' to basic CHCA and CHCA supplement. The supplement was paid for those under school-aged children who were not in public day care when the family received basic CHCA. If CHCA was paid, the sibling was not in public care. If a CHCA supplement was paid, the cohort member was not in public day care.

We looked if the family received CHCA and CHCA supplement during the months of September through November 1993. The families care decisions are typically not provisional but in some cases families may quit public day care over summer and Christmas holidays in exchange for

CHCA.<sup>2</sup> We assume that public day care attendance between September and November 1993 is indicative of long-term care arrangements. Firstly, the cohort members did not have a subjective right for public day care and in the early 1990s it was difficult to get a place in public day care. The municipalities gave priority in allocating public day care to those in paid employment. Secondly, due to the difficult situation in the labour market it is unlikely that a family with a place in public day care would have voluntarily exchanged this place for CHCA.

In 1993 it was possible for the same household to receive both unemployment benefit and CHCA. Therefore we identified also those couples where mother or father received unemployment benefit (we only had information on flat rate unemployment benefit but no information on earning related unemployment benefits).

Families' decisions on child day care options are generally based on the option available for both children. As already pointed out, in 1993 cohort members did not have subjective right to public day care. It is unlikely that the municipalities would have offered public day care for under three year old child but not to his or her older sibling, while it is not clear if the cohort member would have been offered a place in public day care if the family had a younger sibling on CHCA or a mother on parental leave. In these cases the municipalities may have granted day care on social grounds, such as sickness in the family, difficult family situation etc. Therefore we exclude this group (69 girls, 72 boys) from our analysis. Additionally to reduce selection bias we exclude those cohort members whose mother or father received flat rate or means tested unemployment benefit (36 girls, 23 boys).

We used the public day care groups of 2712 cohort members as the reference category (1326 girls, 1386 boys, i.e. no CHCA, maternal leave benefit nor flat rate unemployment benefit was paid). CHCA and CHCA supplement was paid either for mother or father of 4969 cohort members (2448 girls, 2521 boys).

We modelled two outcome variables assessing educational attainment. Firstly, we measured if the cohort member had lower grade point average (4-6 vs. 7-10) after nine years of

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<sup>2</sup> In the early 2000s the average time spend at home for a mother of two children in Finland was 42 months, including possible breaks between the siblings (Haataja & Juutilainen 2014). That shows that parents make decisions on child care options on long-term basis.

compulsory elementary school (age 15 to 16). Secondly, we investigated if the cohort member completed any further education after compulsory elementary school before turning 21.

It is clear that placing a child in public day care is not a random event. To reduce selection bias we adjusted for mothers' educational level (measured in 2008, four categories: primary school only, secondary education, tertiary education, university education), type of municipality in 1994 (urban, semi-urban, rural), mothers' receipt of social assistance (last tier means-tested benefit in Finland) before 1993 and after 1993. Unfortunately our data set did not include information on income or parents' employment status. To study the effect for disadvantaged children we focused on those cohort members whose mother had no further education after elementary school (measured in 2008). Additionally we construct a model where the mother had before 2003 received social assistance.

We used t-test and logistic regression to study if participation in home care was associated with poorer school performance. The models were run separately for girls and boys.

## **5. Results**

The initial t-test analysis showed that as expected the mothers in the day care group have higher education than the mothers in the home care group (Table 1). The families in the day care group received social assistance more often than in the home care group. Families in the day care group lived in urban environment more often than families in the home care group. A smaller share of girls in home care group than in day care group entered further education (89.3% vs. 87.0%,  $p=0.0428$ ), while a larger share of children in the home care group than in day care group had poor grade point average (10.4% vs. 7.9%,  $p=0.0155$ ). For boys there were no differences between home care and day care groups with regard to further education. However, more boys in home care group than in day care group had poor grade point average (27.2% vs. 23.2%,  $p=0.0067$ ).

As the logistic regression in Tables 2 and 3 show, there were statistically associations between child-care arrangements and educational outcomes. Mother's education level was clearly associated with educational outcomes. Mother's low education level was clearly associated with cohort members' low education and poor school grades. That was also the case with family poverty (receipt of social assistance). Boys living in rural environment entered higher

education more often than boy living in urban environment. The fact that statistically significant associations with regard to home care and day care groups shown in table 1 disappear when confounding variables were added in tables 2 and 3 can be explained by higher share of low educated mothers and mothers on social assistance in home care group than in day care group.

On the second stage of the analysis we looked with a simple t-test into those cohort member families where mother had no further education after primary school (Table 4). There were no statistically significant differences in the intergenerational transmission of low education, but as expected boys in the home care group had more often poor grades than in the day care group (52.5% vs 40.6%,  $p=0.041$ ).

Finally we analysed those cohort members whose mothers' had received social assistance some time between 1987 and 2003 (Table 4). Again there were no statistically significant differences in the share of those cohort members with no further education. However, girls in the home care group had more often poor grades than in the day care group (31.5% vs 20.6%,  $p=0.0373$ ).

## **6. Discussion**

We compared educational outcomes of two groups of cohort 1987 members, who had a younger sibling entitling the family to CHCA, one where the cohort member was at home with the younger sibling and the other where both children were in public day care. Our results indicate that staying at home with a younger sibling before the formal school age is not associated with poorer educational outcomes. The findings are in accordance with the results from previous studies showing that on average attendance in universal public day care does not play a significant role in school performance. We obtained weak evidence that among low educated mothers boys may perform worse in school if they stay at home, while girls with poor mothers may get worse school grades if they stay at home with younger sibling. Due to the limited number of observations among the marginalized groups we were not able to further pursue the matter. To answer the question if CHCA is a trap for six-year-olds our response is a cautious "no". However, there are concerns that day care is with regard to educational outcomes a more suitable solution for children from disadvantaged backgrounds.

The major difference between Finland and other Nordic countries is the fact that Finland has performed outstandingly in OECD PISA assessments, while the other Nordic countries have not (Ploug, 2012). This has led the critics to challenge the German pedagogue Friedrich Fröbel's (1782–1852) influential ideas on children learning through games and through activities very much defined by the children's own wishes and interests. The PISA results pointed out that one reason for other Nordic countries mediocre performance was that they had problems in getting children from disadvantaged families on the right educational track. Given the low share of poor performers in PISA studies in Finland it would have been surprising if there would have been a large difference between the public day care and the home care groups. The home care option had been widely used among the Finnish children who have participated in the PISA studies in the 2000s. Furthermore, the length of care periods after parental leave vary to a large extent. It is highly implausible that it would have had a negative effect across the board or among specific groups.

It has to be noted that the analysis was focused only on families where there were at least two children born within a fairly short time-interval. This is not a unique fertility pattern but does weaken the generalizability of the findings. The cohort members staying at home with younger siblings may learn social skills similar to public day care. For other family constellations the choice of child day care options may have different outcomes. However, it is rare that a child without a younger sibling would stay at home. There is no public support for six-year-old children to stay at home before school start if there is not a younger sibling in the family.

### **6.1. Strengths and limitations**

The study was built on a cohort data with follow-up information for 21 years. The unique CHCA benefit scheme with sibling supplement allowed us to study if staying at home before school start affected educational outcomes. Despite these strengths, our study has a number of limitations. First, we were not able to distinguish between care at day care centres and care provided by registered child minders. In terms of stimuli and social contacts the care provided in family day care does not perhaps differ greatly from home care. Second, the home care option is also partly ambiguous. The entitlement to CHCA is not connected with the option where the parents themselves take care of the child. The parents may use the allowance to hire outside caregiver or to pay fees for a private nursery. However, that was a rare option. Additionally we were not able to gain information on the lengths of home care periods of the cohort children, parents earnings,

employment and unemployment. It is possible that some parents on that benefits have taken care of their children at home but their employed spouses have not claimed CHCA. Due to data limitations we were not able to study children from non-marital unions.

It is also obvious that cohort member families in our day care and home care groups may differ in a number of dimensions we were not able to account for. For, example, due to severe economic recession in 1993 cohort member families in the home care group may have suffered from unemployment more than cohort member families in the public day care group. However, a possibly more favourable position of the public day care group was not reflected in the results. We also acknowledge that a large number of confounding factors affect the educational outcomes besides child day care options. It is unlikely, though, that they would systematically vary between our study groups.

The identification of public day care group was based on a three-month period in the fall of 1993. It is possible that the cohort members have been enrolled in public day care before or after this period. However, it is noteworthy that the cohort member did not have a subjective right to public day care when they were under three years. Research on the time periods spend on care leaves has shown that the parents make long-term decisions on the choice of day care options (Haataja & Juutilainen, 2014). We carried out a sensitivity analysis where the identification was based on receipt of home care allowance sibling supplement between February and May 1993 (n=8935). The logistic regression results with all the variables remained basically unchanged.

Despite controls we are not able to draw causal conclusions from our results. It is not possible to generalize our findings to present day conditions in Finland where preschool is compulsory for 6-year-olds and free of charge, or to children in other countries.

## **6.2. Conclusion**

The results of the study show that child home care is not associated with poorer educational performance. They give more support to the notion that the positive results from targeted child day care schemes are not applicable for universal child day care schemes. Children from disadvantaged families may have poorer educational outcomes if they stay at home with a younger sibling.

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Figure 1: Flow chart of study population

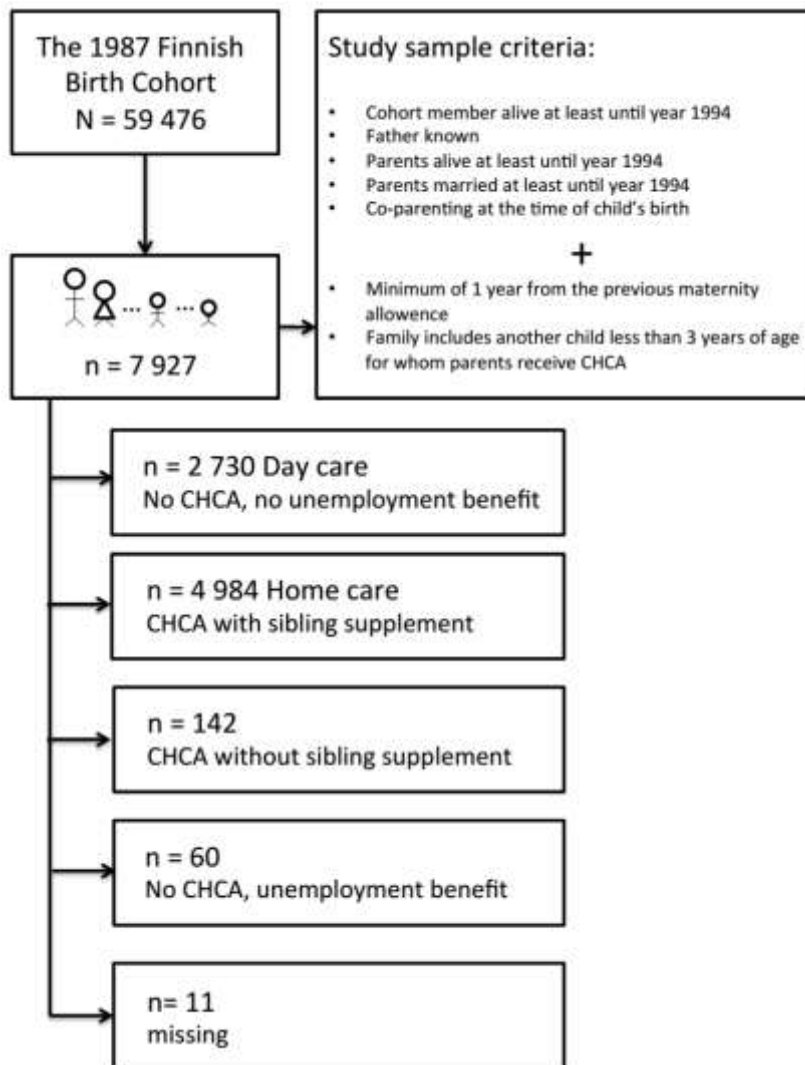


Table 1. The composition of total birth cohort 1987. Day care group and home care group

| Variable                          | Girls |      |          |      |           |      |        |
|-----------------------------------|-------|------|----------|------|-----------|------|--------|
|                                   | All   | %    | Day care | %    | Home care | %    | p      |
| Number of births                  | 29041 |      | 1335     | 4.6  | 2453      | 8.5  |        |
| <b>Mother's highest education</b> |       |      |          |      |           |      |        |
| Primary school only               | 4618  | 15.9 | 97       | 7.3  | 331       | 13.5 | 0.0000 |
| Lower secondary                   | 13055 | 45.0 | 488      | 36.6 | 1218      | 49.7 | 0.0000 |
| Lowest level tertiary             | 6757  | 23.3 | 388      | 29.1 | 538       | 21.9 | 0.0000 |
| High school or higher             | 4611  | 15.9 | 362      | 27.1 | 366       | 14.9 | 0.0000 |
| <b>Mother's social assistance</b> |       |      |          |      |           |      |        |
| 1987-1993                         | 3065  | 10.6 | 34       | 2.6  | 101       | 4.1  | 0.0127 |
| 1994-2008                         | 2773  | 9.5  | 106      | 7.9  | 259       | 10.6 | 0.0091 |
| 1987-2003                         | 5119  | 17.6 | 110      | 8.2  | 284       | 11.6 | 0.0013 |
| <b>Type of municipality*</b>      |       |      |          |      |           |      |        |
| Urban                             | 15419 | 53.1 | 714      | 53.5 | 1148      | 46.8 | 0.0001 |
| Semi-urban                        | 5695  | 19.6 | 262      | 19.6 | 511       | 20.8 | 0.3789 |
| Rural                             | 7683  | 26.5 | 350      | 26.2 | 793       | 32.3 | 0.0001 |
| <b>Further education</b>          |       |      |          |      |           |      |        |
| no - only comprehensive school    | 4688  | 16.1 | 143      | 10.7 | 318       | 13.0 | 0.0428 |
| yes                               | 24353 | 83.9 | 1192     | 89.3 | 2135      | 87.0 | 0.0428 |
| <b>Low grades**</b>               |       |      |          |      |           |      |        |
| gpa 4-6                           | 3439  | 11.8 | 106      | 7.9  | 254       | 10.4 | 0.0155 |
| gpa 7-10                          | 24316 | 83.7 | 1167     | 87.4 | 2138      | 87.2 | 0.8207 |
| <b>Boys</b>                       |       |      |          |      |           |      |        |
|                                   | All   | %    | Day care | %    | Home care | %    | p      |
| Number of births                  | 30435 |      | 1395     | 4.6  | 2531      | 8.3  |        |
| <b>Mother's highest education</b> |       |      |          |      |           |      |        |
| Primary school only               | 4811  | 15.8 | 105      | 7.5  | 333       | 13.2 | 0.0000 |
| Lower secondary                   | 13833 | 45.5 | 561      | 40.2 | 1273      | 50.3 | 0.0000 |
| Lowest level tertiary             | 6957  | 22.9 | 381      | 27.3 | 564       | 22.3 | 0.0004 |
| High school or higher             | 4834  | 15.9 | 348      | 24.9 | 361       | 14.3 | 0.0000 |
| <b>Mother's social assistance</b> |       |      |          |      |           |      |        |
| 1987-1993                         | 3125  | 10.3 | 34       | 2.4  | 77        | 3.0  | 0.2737 |
| 1994-2008                         | 2856  | 9.4  | 120      | 8.6  | 293       | 11.6 | 0.0036 |
| 1987-2003                         | 5251  | 17.3 | 127      | 9.1  | 279       | 11.0 | 0.0587 |
| <b>Type of municipality*</b>      |       |      |          |      |           |      |        |
| Urban                             | 16119 | 53.0 | 748      | 53.6 | 1181      | 46.7 | 0.0000 |
| Semi-urban                        | 6063  | 19.9 | 285      | 20.4 | 556       | 22.0 | 0.2611 |
| Rural                             | 7968  | 26.2 | 357      | 25.6 | 791       | 31.3 | 0.0002 |
| <b>Further education</b>          |       |      |          |      |           |      |        |
| no - only comprehensive school    | 6296  | 20.7 | 238      | 17.1 | 443       | 17.5 | 0.7263 |
| yes                               | 24139 | 79.3 | 1157     | 82.9 | 2088      | 82.5 | 0.7263 |
| <b>Low grades**</b>               |       |      |          |      |           |      |        |
| gpa 4-6                           | 8769  | 28.8 | 324      | 23.2 | 688       | 27.2 | 0.0067 |
| gpa 7-10                          | 20271 | 66.6 | 1012     | 72.5 | 1756      | 69.4 | 0.0374 |

\*missing values all) n=529/ girls 244/ boys 285, day care) n= 14 / girls 9 / boys 5, home care) n=4/ girls 1/ boys 3

\*\* missing values all) n=2 681/ girls 1 286/ boys 1 395, day care) n=121 / girls 62/boys 59 , home care) n=148 /girls 61 / boys 87

*Table 2. Odds ratios (ORs) with 95% confidence intervals (95% CIs) for no further education after primary school.*

| Variable                          | No further education |         |             | Boys |         |             |
|-----------------------------------|----------------------|---------|-------------|------|---------|-------------|
|                                   | OR                   | p-value | 95% CI      | OR   | p-value | 95% CI      |
| <b>Day care type</b>              |                      |         |             |      |         |             |
| Home care                         | 1.05                 | 0.687   | (0.84-1.31) | 0.88 | 0.183   | (0.74-1.06) |
| Day care (ref.)                   | 1.00                 |         |             | 1.00 |         |             |
| <b>Mother's highest education</b> |                      |         |             |      |         |             |
| Primary school only               | 3.35                 | 0.000   | (2.25-5.00) | 3.82 | 0.000   | (2.76-5.29) |
| Lower secondary                   | 2.13                 | 0.000   | (1.50-3.01) | 1.91 | 0.000   | (1.45-2.52) |
| Lowest level tertiary             | 1.20                 | 0.373   | (0.81-1.78) | 1.20 | 0.249   | (0.88-1.65) |
| High school or higher (ref.)      | 1.00                 | 0.000   |             | 1.00 | 0.000   |             |
| <b>Mother's social assistance</b> |                      |         |             |      |         |             |
| No social assistance (ref.)       | 1.00                 | 0.000   |             | 1.00 | 0.000   |             |
| 1987-1993                         | 3.81                 | 0.000   | (2.59-5.61) | 2.32 | 0.000   | (1.53-3.50) |
| 1994-2008                         | 3.24                 | 0.000   | (2.49-4.21) | 2.23 | 0.000   | (1.76-2.82) |
| <b>Type of municipality</b>       |                      |         |             |      |         |             |
| Urban (ref.)                      | 1.00                 | 0.540   |             | 1.00 | 0.026   |             |
| Semi-urban                        | 0.93                 | 0.564   | (0.71-1.21) | 0.86 | 0.188   | (0.69-1.08) |
| Rural                             | 0.88                 | 0.276   | (0.69-1.11) | 0.76 | 0.008   | (0.62-0.93) |

*Table 3. Odds ratios (ORs) with 95% confidence intervals (95% CIs) for low primary school grades.*

| Variable                          | Low grades |         |              | Boys |         |              |
|-----------------------------------|------------|---------|--------------|------|---------|--------------|
|                                   | OR         | p-value | 95% CI       | OR   | p-value | 95% CI       |
| <b>Day care type</b>              |            |         |              |      |         |              |
| Home care                         | 0.96       | 0.745   | (0.75-1.23)  | 0.97 | 0.704   | (0.82-1.14)  |
| Day care (ref.)                   | 1.00       |         |              | 1.00 |         |              |
| <b>Mother's highest education</b> |            |         |              |      |         |              |
| Primary school only               | 6.14       | 0.000   | (3.52-10.71) | 7.88 | 0.000   | (5.67-10.95) |
| Lower secondary                   | 5.00       | 0.000   | (3.00-8.33)  | 4.26 | 0.000   | (3.22-5.63)  |
| Lowest level tertiary             | 1.60       | 0.114   | (0.89-2.86)  | 1.96 | 0.000   | (1.44-2.67)  |
| High school or higher (ref.)      | 1.00       | 0.000   |              | 1.00 | 0.000   |              |
| <b>Mother's social assistance</b> |            |         |              |      |         |              |
| No social assistance (ref.)       | 1.00       | 0.000   |              | 1.00 | 0.000   |              |
| 1987-1993                         | 3.90       | 0.000   | (2.57-5.92)  | 2.34 | 0.000   | (1.56-3.53)  |
| 1994-2008                         | 3.36       | 0.000   | (2.54-4.46)  | 1.93 | 0.000   | (1.54-2.41)  |
| <b>Type of municipality</b>       |            |         |              |      |         |              |
| Urban (ref.)                      | 1.00       | 0.733   |              | 1.00 |         |              |
| Semi-urban                        | 1.04       | 0.807   | (0.77-1.40)  | 1.07 | 0.483   | (0.88-1.30)  |
| Rural                             | 1.10       | 0.432   | (0.86-1.44)  | 1.02 | 0.850   | (0.85-1.22)  |

*Table 4. Share of those with no further education and low grades among cohort members whose mothers have no further education.*

|           | No further education |      |         |      |      |         |
|-----------|----------------------|------|---------|------|------|---------|
|           | Girls                |      |         | Boys |      |         |
|           | n                    | %    | p-value | n    | %    | p-value |
| Day care  | 97                   | 21.6 |         | 105  | 38.1 |         |
| Home care | 331                  | 24.2 | 0.6073  | 333  | 32.4 | 0.2848  |
|           | Low grades           |      |         |      |      |         |
|           | Girls                |      |         | Boys |      |         |
|           | n                    | %    | p-value | n    | %    | p-value |
| Day care  | 94                   | 19.1 |         | 96   | 40.6 |         |
| Home care | 326                  | 18.7 | 0.9239  | 316  | 52.5 | 0.0410  |

*Table 5. Share of those with no further education and low grades among cohort members whose mothers received social assistance between 1987 and 2003.*

|           | No further education |      |         |      |      |         |
|-----------|----------------------|------|---------|------|------|---------|
|           | Girls                |      |         | Boys |      |         |
|           | n                    | %    | p-value | n    | %    | p-value |
| Day care  | 110                  | 27.3 |         | 127  | 30.7 |         |
| Home care | 284                  | 32.7 | 0.2929  | 279  | 32.6 | 0.7025  |
|           | Low grades           |      |         |      |      |         |
|           | Girls                |      |         | Boys |      |         |
|           | n                    | %    | p-value | n    | %    | p-value |
| Day care  | 102                  | 20.6 |         | 119  | 42.9 |         |
| Home care | 273                  | 31.5 | 0.0373  | 267  | 47.2 | 0.6083  |