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# **Parental unemployment and children's school performance**

Anna Öster

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# Parental unemployment and children's school performance<sup>#</sup>

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## Abstract

This study investigates the effect of parental unemployment on children's school performance. We use individual level data for all children completing lower secondary school in Sweden in 1990 directly moving on to three years of upper secondary school. We control for family and individual heterogeneity by means of lower secondary school GPA. The huge variation in Swedish unemployment during the beginning of the 1990s provides an ideal setting for testing the hypothesis that parental unemployment affects children's school performance. Our results indicate that having an unemployed father has a negative effect on children's school performance while having an unemployed mother has a positive effect.

Keywords: School performance, unemployment

JEL-codes: E24, I21, J12

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# 1 Introduction

There is a large literature studying various indirect effects of unemployment, suggesting an effect of unemployment on health, both mental and physical, and crime to mention a few. Björklund and Eriksson (1998) examine research on the link between unemployment and mental health in the Nordic countries, and find that most longitudinal studies suggest unemployment to be associated with deteriorating mental health. Eliason and Storrie (2004) use Swedish individual level data and find that job losses shorten the life of men, while Nilsson and Agell (2005) report significant effects of unemployment on property crime. The aim of this paper is to consider another possible indirect effect of unemployment, namely the school performance of the children of the unemployed.

When a family member becomes unemployed, the whole family is likely to be affected by the new situation, which in turn could affect the school performance of the children concerned. Households suffering from unemployment typically experience several disadvantages, such as lower incomes, smaller social networks and potentially also having to live in worse neighborhoods. On the other hand, being unemployed might mean that you can spend more time with your children. This extra time could, of course, be spent helping your children with homework or other issues to improve their achievement in school.

As far as I am aware, this is the first economic paper analyzing a relationship between parental unemployment and children's school performance.<sup>1</sup> In addition to studies of other indirect effects of unemployment, the question could also be linked to the literature on the effect of a divorce on the educational achievement of children, since many of the disadvantages of families suffering from unemployment spells could be compared to the difficulties following a divorce.<sup>2</sup> For example, single-parent families on average have lower incomes and smaller social networks, characteristics mentioned above for families suffering from unemployment. There is a large literature indicating that

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<sup>1</sup> Micklewright et al (1990) is the only economic study of which I am aware that mentions a potential effect of parental unemployment on children's school performance and the focus of that study is on children leaving school. For a sociological aspect on the consequences of unemployment for families, see e.g. Ström (2003).

<sup>2</sup> For reviews of the literature on educational disadvantages of children experiencing a divorce or growing up with a single parent, see Amato and Keith (1991), Cherlin (1999) and Björklund and Sundström (2006).

youth living with a single mother or a stepparent have lower rates of completing high school or starting college, and higher rates of arrest and drug use as compared to youth in intact families.<sup>3</sup> As when evaluating the effect of divorce on school performance, the question to solve is whether the disadvantages of children whose parents experience unemployment could be predicted prior to the unemployment spell, or whether the unemployment caused the disadvantages. To determine such a causal effect of parental unemployment on children's school performance, the pre-existing disadvantages of the family or youth must be controlled for. This is done by controlling for the pre-incident skill-level of the child, in terms of lower secondary school grade point average (GPA), and various child and family characteristics.

I use Swedish data on individual GPA from the completion of lower secondary school (*grundskolan*) at the age of 16 and final grades from upper secondary school (*gymnasiet*) for a majority of all children completing lower secondary school in 1990 and directly moving on to three years of upper secondary school, which they complete in 1993. Since grades are to a large extent used for entrance to higher education in Sweden, investigating the determinants of grades is of great importance. Only considering children attending a three-year upper secondary school program will induce sample-selection problems, which will be discussed in detail below. To estimate the effect of parental unemployment on children's school performance, children with at least one parent subjected to unemployment during the period they attend upper secondary school will be compared to children whose parents have been working throughout the whole period. I will also consider whether maternal and paternal unemployment have different effects on children's school performance and whether the length of the unemployment spell is of importance. Grades are not reported until the pupil has turned 16, i.e. when the pupil has completed lower secondary school; hence, due to data availability, I can only estimate the effect of parental unemployment on the school performance during upper secondary school.

The huge variation in Swedish unemployment at the beginning of the 1990s provides an ideal setting for my study.<sup>4</sup> The unemployment rate in 1990 was

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<sup>3</sup> Manski et al (1992) use U.S. data and estimate the effect of divorce on high school graduation, letting the family structure be endogenous. Their findings indicate that living in an intact family increases the probability of a child graduating from high school. Hoffman and Johnson (1998) evaluate the effect of family structure on adolescent drug use and Coughlin and Vuchinich (1996) discuss the effect on delinquency.

<sup>4</sup> For a discussion of the Swedish macroeconomic crisis of the 1990s, see Lindbeck (1997).

less than two percent of the labor force while in 1993, it was close to nine percent. Individuals in all segments of society experienced unemployment spells during this period, and becoming unemployed when unemployment rates are high could lead to more distress than otherwise, since the possibility of getting a new job is lower. On the other hand, being unemployed when unemployment rates are high is often considered to be associated with lower social and psychological costs.<sup>5</sup> Nonetheless, it is an advantage that the variation in Swedish unemployment can be traced to macroeconomic events, which are exogenous to the individual.

My results indicate that having an unemployed father has a negative effect on a child's school performance, while having an unemployed mother has a positive effect. One explanation for the differing results across genders could be that women in general cope better with being unemployed and hence, are able to use their new extra time doing something productive, such as spending quality time with their children.

The next section describes the data, and presents the empirical strategy. Section 3 reports the results, section 4 contains some sensitivity analysis, focusing on issues of sample-selection bias, and the final section sums up.

## 2 Data and empirical strategy

### 2.1 The children and their parents

The data set contains information on individual GPA from the completion of lower secondary school at the age of 16 and final grades from upper secondary school at the age of 19 from *Elevregistret* collected by *Statistics Sweden*. I concentrate my study on the children completing lower secondary school in 1990 and then directly continuing with three years of upper secondary school. I have excluded children choosing to attend a two-year vocational program after lower secondary school and children taking a sabbatical year after lower secondary school or choosing to spend a year abroad during upper secondary school. Excluding children only attending upper secondary school for two years probably means that I disregard children with disadvantaged background. Although such children are of great importance when studying the determinants of children's

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<sup>5</sup> See Åberg et al (2003) for a discussion on social interactions and unemployment.

educational achievement, I choose to concentrate on the largest relatively homogenous group of children choosing a three-year upper secondary school program.

In total, 109,392 children completed lower secondary school in 1990. Out of these, 53,000 (48.4 %) completed upper secondary school in 1993. However, 5,750 of these children completed a program shorter than three years and for 11,700 of the remaining children, I have missing observations on key-variables.<sup>6</sup> Hence, in my study, I consider 35,550 children completing lower secondary school in 1990 and completing a three-year upper secondary school program in 1993. In total, I consider 32.5 percent of all children completing lower secondary school in 1990, the largest relatively homogenous group. 16,474 (15.1 % of the population) of the excluded children had still not completed an upper secondary school program in 1999, 31,384 (28.7 % of the population) attended a shorter upper secondary school program which they completed before 1993, and 8,534 children (7.8 % of the population) completed some kind of upper secondary school program during the period 1994 to 1999. The characteristics of the excluded children will be discussed in section 4.2.

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<sup>6</sup> The excluded children mainly have missing observations on the family structure (whether the child lives with both his/her biological parents). The children studied can still have missing observations on paternal or maternal characteristics, but not on both parents. The group with missing observations on key variables is discussed in more detail in section 4.2.



**Table 1** Characteristics of the children and their parents

	Children	Mother	Father
Female	0.497		
Year of birth:			
Min	1972		
Max	1974		
Country of birth:			
Sweden	0.963	0.900	0.758
Nordic countries	0.006	0.046	0.028
Europe	0.008	0.030	0.033
Outside Europe	0.023	0.016	0.014
Missing observation	0	0.008	0.167
Highest level of completed education:			
Lower secondary		0.175	0.187
Upper secondary		0.443	0.351
University		0.348	0.273
Missing observation		0.034	0.189

Note: Lower secondary school indicates compulsory school for ten years or less, upper secondary school indicates up to four years of upper secondary school and university indicates at least some studies at the university after upper secondary school. Missing observations on the characteristics of the parents stem from the fact that information on both parents is only included when children live in the same household as both parents. The complete data set contains information on 35,550 children.

Table 1 gives some descriptive statistics on the characteristics of the children in my sample and their parents. Information on family and youth characteristics is gathered from the longitudinal database on education, income and employment (LOUISE) and the register-based labor market statistics database (RAMS) of *Statistics Sweden*. Worth noting is that there are almost as many girls as boys in the sample, and that a very large proportion of the children were born in Sweden. In my data, about 98.6 percent of the children completed lower secondary school during the calendar year when they became 16 years old, 1.4 percent in the year they turned 17.

Missing observations on the characteristics of the parents stem from the fact that information on both parents is only included when children live in the

same household as both parents. Thus, children are registered as belonging to the same family as only one of the parents if the parents are divorced.<sup>7</sup>

## 2.2 Data on school performance

During the period of my study, Sweden had a national relative grading system where the grades were determined based on comparisons with the national average achievement. The scale ranged from 1 to 5 and the goal was that the national average should be 3, with a standard deviation of 1. Hence, the fraction of pupils to receive each grade was predetermined.<sup>8</sup>

The relative grading system implied that grades in lower secondary school were determined by comparing all children with the national average achievement in the specific grade, while grades in upper secondary school were determined by comparing with the achievement of everyone attending the same upper secondary school program. Grade competition would thus depend on the chosen program, where children choosing a demanding theoretical program (e.g. the natural science program) would have to compete harder for high grades than during lower secondary school. The increasing competition implies that grades from lower and upper secondary school are not entirely comparable. I will take this into consideration by ranking the GPA from both lower and upper secondary school of all children attending the same program and school during upper secondary school.<sup>9</sup> Hence, the ranking is made within program and school, comparing the GPA of all children attending the same upper secondary school and program. The GPA rank is then transformed into percentiles. The effect will thus be determined on whether the GPA percentiles of the children concerned have been affected by parental unemployment.

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<sup>7</sup> Among the children studied here, only 17 percent live without their father (a number based on the information on missing observations on the country of birth of the father). In 1990, only 70 percent of all children aged 16 lived with both their biological/adoptive parents. The group of children studied here is thus not representative of the general population in that respect. I will discuss the characteristics of the children studied in comparison to other groups in more detail below.

<sup>8</sup> To guide teachers in their grading, there were national achievement tests in Math, Swedish and English. Since grades are determined by the teacher or the school, I would have preferred data from the standardized test scores, but such data are not available. However, since grades are to a large extent used for entrance to higher education, investigating the determinants of grades is of great importance. The relative grading system was criticized for its lack of knowledge orientation and was changed into a criterion-referenced system, implemented in the school year of 1995/96.

<sup>9</sup> The specific school is taken into consideration to account for the incidence of grade inflation. See Wikström and Wikström (2004) for a discussion of grade inflation and school competition.

Table 2 shows descriptive statistics on the children’s GPA from lower and upper secondary school and dummy variables capturing the program attended during upper secondary school. On average, these children got a lower GPA from upper secondary school than when completing lower secondary school. This lower GPA from upper secondary school could certainly be an effect of higher grade competition. The program variables indicate that almost 85 percent of the children attending a three-year upper secondary school program chose a theoretical program (natural science, social science, business, technical science, humanities).

**Table 2** Descriptive statistics, schooling variables

Variables	Min	Max	Mean	Standard deviation
GPA, lower secondary school	1	5	3.643	0.521
GPA, upper secondary school	1	5	3.352	0.631
Natural science program	0	1	0.132	0.338
Social science program	0	1	0.208	0.406
Business program	0	1	0.248	0.432
Technical science program	0	1	0.197	0.398
Humanities program	0	1	0.059	0.235
Non-theoretical program	0	1	0.156	0.362

Note: The program variables are dummy variables equal to one if the child attended the specific program during upper secondary school, and zero otherwise. The complete data set contains information on 35,550 children.

### 2.3 The empirical specification

The empirical method builds on the idea that lower secondary school GPA can be used to control for family and individual heterogeneity. The starting point for the econometric analysis will be the following model:

$$r_{ispt} = \alpha_j + \theta r_{isp,t-1} + \delta U_i + \beta X_{it} + \varepsilon_{it}, \quad (1)$$

where the dependent variable is the GPA percentile of individual  $i$ , within upper secondary school  $s$  and program  $p$  at time  $t$ , in this case 1993 when the child completes upper secondary school.  $\theta$  is the coefficient on the corre-

sponding GPA percentile upon the completion of lower secondary school,  $\alpha_j$  captures municipality-specific factors,  $\delta$  is the coefficient capturing the unemployment effect where  $U_i$  is a dummy variable taking the value of one if the child experienced parental unemployment during upper secondary school.  $X_{it}$  is a vector of control variables and  $\varepsilon_{it}$  is an individual-specific error term. The coefficients will have the interpretation of the change in GPA percentile due to a change in the control variables. Thus, a positive coefficient indicates a GPA improvement and vice versa.

The *Swedish National Labour Market Administration* has provided information on the parents' employment status. I have information on all unemployment spells of the parents during 1990-1993, i.e. the period in question. I have used this information to construct a dummy variable capturing the event of an unemployment spell in the family, which will be equal to one if at least one of the parents has been unemployed at least once during the period when the child attends upper secondary school, and zero otherwise.

The control variables in eq. (1) can be considered as either characterizing a continuous change or an incident during upper secondary school. Because of less than clear-cut evidence on the effect of parental separation on children's school performance, I will include parental separation as a control variable in some specifications to avoid a potential source of omitted variable bias.<sup>10</sup> Changes in family structure are recorded in LOUISE. In this study, I will only consider a separation of the child's biological/adoptive parents as a divorce. However, the parents do not need to be married prior to the separation; they only need to be cohabitant. The separation variable will therefore be a dummy variable equal to one if there has been a separation in the family, and zero otherwise.

Another event that could possibly influence the school performance of a child is if the family moves and the child has to change schools. I have information on which school the child attends when completing lower and upper

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<sup>10</sup> Using Swedish data, Björklund and Sundström (2006) find no impact of parental separation during childhood on the educational outcomes as adults when using a sibling approach to control for unobservable family characteristics. This contrasts with findings of Jonsson and Gähler (1997) who also use Swedish data and find that parental divorce has an impact on primary school grades at the age of 16. While Björklund and Sundström (2002) estimate a long-run effect of parental separation, Jonsson and Gähler (1997) estimate a short-run effect; hence the differing results could be an indication of a distinction between the temporary and permanent effects of parental separation on educational outcomes.

secondary school. However, since all children change schools when starting upper secondary school, it cannot be determined through school-codes whether the child has changed schools during upper secondary school. Hence, I use information, from LOUISE, on which municipality the family resides in each year.<sup>11</sup> Although the child could have changed schools without moving to a new municipality, this is the best indication of changing schools to which I have access. A more detailed geographical classification is that of parishes. However, parishes are often so small that it is very likely that the child does not have to change schools even if the family moves to a new parish. Moving to a new municipality does almost exclusively result in the child having to change schools, however. The variable capturing the incidence of a family moving will be a dummy variable equal to one if the family has moved to a new municipality during upper secondary school, and zero otherwise.

Other issues that could influence the school performance of children are the economic situation of the family, as well as how much the child must compete for parental attention. To control for such issues, I have collected information, also from LOUISE, on social assistance, the evolution of family disposable income as well as the change in the number of children living at home during the relevant three years.<sup>12</sup> Social assistance is characterized by a dummy variable equal to one if the family received social assistance during the three-year period, and zero otherwise. The other variables are differences occurring between 1990 and 1993.

It should be noted that both parental unemployment and separation could affect other control variables such as disposable income or social assistance. It must also be considered that the probability of a child experiencing parental unemployment could increase if the child lives with both parents. This would induce a correlation between the incidence of unemployment and separation possibly influencing the results. I will take this into consideration by including an interaction between the unemployment and separation variables as well as by separating the effect of unemployment between mothers and fathers.

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<sup>11</sup> In 1990, there were 284 municipalities in Sweden. In 1992, two additional municipalities were formed but I use the former classification.

<sup>12</sup> The measures of disposable income and social assistance do not take family size into account. However, I indirectly control for family size through the divorce variable and the number of children living at home. The number of children living at home is counted as the number of children living in the family in addition to the child I am investigating.

Descriptive statistics on the control variables are shown in Table 3. During the period I have chosen to investigate, there was significant turbulence in the Swedish labor market and this volatility is clearly visible in the data. Nearly twenty percent of the children experienced at least one of their parents becoming unemployed. From eq. (1), it is obvious that the observations that will identify the estimates are those where a change has taken place, i.e. those observations determining the coefficient on parental unemployment are the children having experienced an unemployment spell in their family. Since I cannot prove that this group is representative of the population, the results are not general to the whole population; it is an advantage, though, that this group is large. It is also an advantage that the variation in Swedish unemployment can be traced to macroeconomic events, which are exogenous to the individual. To consider the measured effects as causal effects, unemployment must be assumed to be randomly assigned. Although this is a strong assumption, the link to macroeconomic events probably makes it less unrealistic than during other periods. This issue will be discussed in more detail below.

**Table 3** Descriptive statistics, control variables

Variables	Min	Max	Mean	Standard deviation
Unemployment	0	1	0.193	0.395
Separation	0	1	0.016	0.126
Move, new municipality	0	1	0.017	0.130
Social assistance	0	1	0.098	0.298
Disposable income	-3.118	17.587	-0.008	0.101
Children	-4	3	-0.191	0.477

Note: Unemployment, separation, the move-variable and social assistance are all dummy variables. Disposable income and the number of children are the differences in these variables occurring between 1990 and 1993. Disposable income is calculated for the family in basic amounts in 1990 SEK. Children is the number of children living at home in addition to the child I am investigating. The complete data set contains information on 35,550 children.

Table 3 also reveals that the incidence of separation is low, and I must therefore be careful in drawing any strong conclusions on the effect of a separation on children's school performance. It is not surprising that so few children experience a separation in my sample, since most separations occur when chil-

dren are younger.<sup>13</sup> In the separation measure above, I have only taken separations of biological/adoptive parents into account. It could, however, be argued that a child would also suffer from a separation from a stepparent and taking such separations into account could potentially increase the group of children having experienced a separation during the period, thereby giving a more reliable estimate. It turns out, however, that considering all separations only increases the group from 1.6 to 2 percent of the full sample. The group of children experiencing a move to a new municipality is also small and calls for the same caution regarding the estimated effects as in the case of separation. Further, nearly ten percent of the children lived in families that received social assistance during the period in question, and family disposable income marginally decreased as well as the number of children living in these families.

In addition to the control variables mentioned above, all specifications will include information on child and parental nationality, as well as parental education. Although I include lower secondary school GPA to control for individual and family heterogeneity, eq. (1) is best characterized as a cross-section. Hence, to minimize the risk of omitted variable bias, I include what I view as important family and child characteristics in the specification.<sup>14</sup> The nationality of the child is captured through a dummy variable equal to one if the child was not born in Sweden, and zero otherwise. Two dummy variables capture parental nationality, one that is equal to one if at least one of the parents were born outside Sweden but within Europe. The other dummy-variable is equal to one if at least one of the parents were born outside Europe. Hence, if one of the parents was born outside Sweden but within Europe and the other was born outside Europe, both dummy variables are equal to one. The variables capturing parental education are dummy variables equal to one, if at least one of the parents has achieved the relevant level of education, secondary or university education. Secondary school indicates up to four years of upper secondary school and university indicates at least some studies at the university after upper secondary school.

The error term in eq. (1) captures, among other things, the ability and motivation of the child. If the motivation of a child is correlated with incidents oc-

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<sup>13</sup> Suppose that the oldest child in a family has started upper secondary school, then the parents must have stayed together for at least seventeen years and the number of separations can be assumed to decrease with the length of the relationship.

<sup>14</sup> The family and child characteristics are presented in Table 1.

curing during upper secondary school for which I do not control, I could have a specification bias problem. Naturally, there are incidents that could occur during upper secondary school and influence the child's grades for which I am not able to control. Examples of such factors are alcoholism in the family, a parent being incarcerated or if the child starts socializing with the wrong crowd. Ultimately, I have to hope that these omitted influences are rare enough so as not to create significant problems.

Another specification issue that deserves some attention, is that of endogeneity stemming from reverse causation. If a child has difficulties in school and this influences the parents in such a way that they start neglecting their work, eventually leading to unemployment, this would lead me to estimates exaggerating the impact of unemployment on children's school performance. This situation, seems very far-fetched, however, and I believe such a problem to be a second-order issue.

Many studies use a sibling-difference approach when studying the impact of family characteristics on youth outcomes. The main advantage of these studies is that any omitted variables describing the children's family situation that are stable over time are shared by all siblings and hence, cancelled out of the equation. A disadvantage of the sibling approach is that it does not control for within-family heterogeneity, i.e. the approach assumes that all siblings are raised identically, which is often not the case.<sup>15</sup> In my study, the upbringing will, to a large extent, be captured by the pre-incident youth outcome in terms of lower secondary school GPA. Further, the sibling-approach will have the same problems with time-variant omitted variables as the approach used in this paper.<sup>16</sup>

## 3 Results

### 3.1 Basic results

As mentioned above, the inclusion of some of the control variables could influence the coefficient of primary interest, i.e. that on parental unemployment. For example, families suffering from unemployment have, on average, lower in-

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<sup>15</sup> Holmlund (2005) finds that within-family heterogeneity biases her basic sibling-approach estimates when estimating labor market consequences of teenage childbearing.

<sup>16</sup> For a discussion of the sibling-estimator, see Ermisch & Francesconi (2001).



comes; hence, the disposable income variable might capture part of the "unemployment-effect", and vice versa. Table 4 presents the results from four specifications where I include different sets of control variables. Specification (1) disregards the separation and income variables, specification (2) includes separation, specification (3) extends the analysis by including both family disposable income and social assistance and specification (4) is an expansion of specification (3), including an interaction between parental unemployment and separation. The step-wise extension of the specification will give some guidance to the severity of the correlation issues discussed above. In addition to the control variables mentioned above, all specifications include lower secondary school GPA and information on whether the child has moved during upper secondary school, the change in the number of children living in the family, child and parental nationality and parental education.

As can be seen, the size of coefficient on parental unemployment is influenced by the inclusion of both the separation and the income variables. It is, however, insignificant in all specifications. A possible explanation for the lack of an effect of parental unemployment on the school performance of the children concerned could be that the effect of parental unemployment depends on whether it is the mother or the father who is unemployed. I will consider this possibility below.

**Table 4** Basic results of unemployment impact on school ranking

Specification	(1)	(2)	(3)	(4)
GPA percentile,	0.686***	0.686***	0.682***	0.682***
lower secondary school	(0.004)	(0.004)	(0.004)	(0.004)
Unemployment	-0.427	-0.411	-0.111	-0.086
	(0.289)	(0.289)	(0.290)	(0.291)
Separation	-	-1.896**	-1.678*	-1.351
	-	(0.908)	(0.907)	(1.037)
Move	-1.156	-1.093	-0.948	-0.943
	(0.861)	(0.862)	(0.863)	(0.869)
Disposable income	-	-	0.759	0.765
	-	-	(0.578)	(1.096)
Social assistance	-	-	-4.008***	-4.007***
	-	-	(0.400)	(0.389)
Children	0.063	0.034	-0.001	-0.0003
	(0.234)	(0.235)	(0.235)	(0.234)
Interaction of unemployment	-	-	-	-1.205
and separation	-	-	-	(1.988)
Child nationality, not Swedish	-3.307***	-3.323***	-2.949***	-2.950***
	(0.673)	(0.673)	(0.673)	(0.663)
Parental nationality:				
Europe	0.253	0.262	0.447	0.445
	(0.378)	(0.378)	(0.378)	(0.372)
Outside Europe	-0.146	-0.134	0.617	0.616
	(0.916)	(0.917)	(0.916)	(0.887)
Parental education:				
Upper secondary	1.686***	1.694***	1.455***	1.456***
	(0.386)	(0.386)	(0.386)	(0.379)
University	5.774***	5.784***	5.364***	5.364***
	(0.392)	(0.392)	(0.393)	(0.385)

Note: Standard errors are in parenthesis. All standard errors are robust to heteroscedasticity. In addition to the variables shown in the table, all regressions include a municipality-specific effect. The complete panel consists of 35,500 observations. \*\*\* denotes significance at the one-percent level.

The coefficient on the separation variable is negative and significant at the ten-percent level when the economic situation of the family is taken into account (column 3). The estimate suggests that separation during upper secondary school induces the child to drop 1.7 percentiles in the GPA ranking. The coefficient on the move variable is, as anticipated, negative although insignificant. Disposable income also displays an insignificant coefficient with the expected positive sign. On the other hand, the dummy variable capturing whether the family has received social assistance during the period exhibits a negative coefficient significant at the one-percent level. According to my results, a child living in a family receiving social assistance during upper secondary school drops four percentiles in the GPA ranking. Further, the coefficient on the number of children is positive, which is non-intuitive but insignificant.<sup>17</sup>

Considering the background variables, it is evident that being born outside Sweden has a negative effect on the GPA ranking. It could be expected that such an effect would be taken into consideration through the lower secondary school GPA. However, it is not unlikely that the disadvantages of being born in another country become more evident at a higher, and more demanding, educational level. Parental nationality does not seem to have any additional effect during upper secondary school,<sup>18</sup> while parental education does. The effect of having low-educated parents could certainly become more evident when attending upper secondary school through lower parental understanding and support. It remains to be seen how robust these basic results are when I consider which parent is unemployed and the length of the unemployment spell.

### **3.2 Disentangling the unemployment effect**

So far, I have investigated whether there is an effect of at least one parent having at least one unemployment spell during the period when their child attends upper secondary school, and the results have been insignificant. One could, however, imagine that the effect would be different, depending on whether the mother or the father was the one suffering from unemployment, and depending on the length of the unemployment spell. In all likelihood, long-term employment creates more distress than short-term unemployment. Moreover, the effect could differ between men and women, simply because they react differently to

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<sup>17</sup> It could be the case that the number of children living in a family is not linearly related to the school performance of the children. However, different specifications yield similar results.

<sup>18</sup> Considering more narrow geographical classifications does not yield more significant results.

becoming unemployed. Eliason and Storrie (2004) find that losing your job shortens the life of men but not of women. One of their explanations is that women can cope better when becoming unemployed because of their more developed social networks outside the workplace. Coping better could imply being able to use your new extra time to do something productive, such as spending quality time with your children. Suffering greatly from being unemployed almost certainly makes it difficult to be a positive influence on the surroundings. Separating the effect by gender also helps reducing the problem with a potentially higher probability of experiencing parental unemployment for children living with both parents.

To investigate whether the effect of unemployment on children’s school performance depends on whether it is the mother or the father who has been unemployed, I include dummy-variables capturing the separate events. If both the mother and the father have been unemployed during the period, both dummy-variables will be equal to one. The length of the unemployment spell is also captured by dummy-variables. I construct four dummy-variables capturing whether the child has had a short-term unemployed mother, a long-term unemployed mother, a short-term unemployed father or a long-term unemployed father. Hence, at most two of these dummy-variables can equal one for one specific child. Table 5 displays the descriptive statistics on the new unemployment variables.

**Table 5** Descriptive statistics, unemployment variables

Variables	Min	Max	Mean	Standard deviation
Unemployment, mother	0	1	0.129	0.335
Unemployment, father	0	1	0.081	0.272
Short-term unempl. mother	0	1	0.080	0.272
Long-term unempl. mother	0	1	0.049	0.214
Short-term unempl. father	0	1	0.054	0.226
Long-term unempl. father	0	1	0.026	0.161

Note: All variables are dummy variables. As long-run unemployment, I count unemployment spells lasting more than one year. The complete dataset contains information on 35,550 children.

The first column in Table 6 repeats the coefficient from specification (3) in Table 4 and the last two columns present the results from two new specifications replicating specification (3) in Table 4, but exchanging the unemployment

variable with the new dummy variables separating the unemployment effect. Interestingly, the coefficient on the mother being unemployed is positive, which could be interpreted as the positive effect of having extra time on your hands exceeding the negative effects of the disadvantages caused by unemployment. The estimate suggests that having an unemployed mother during upper secondary school improves the child's GPA by 0.7 percentiles. The positive sign of the coefficient remains when the length of the unemployment spell is taken into account, although the coefficients are insignificant.

**Table 6** Investigating the effect of parental unemployment

Specification	Base-specification	Mother/father	Short-term/Long-term
Unemployment	-0.111 (0.290)	- -	- -
Mother	- -	0.694** (0.341)	- -
Father	- -	-1.582*** (0.413)	- -
Mother short-term	- -	- -	0.647 (0.412)
Mother, long-term	- -	- -	0.775 (0.541)
Father, short-term	- -	- -	-1.882*** (0.495)
Father, long-term	- -	- -	-0.964 (0.700)

Note: Base-specification is column (3) in Table 4. As long-run unemployment, I count unemployment spells lasting more than one year. Standard errors are in parenthesis. All standard errors are robust to heteroscedasticity. In addition to the variables shown in the table, all regressions include a municipality-specific effect and the same control variables as the base-specification. Estimates on the control variables are shown in Appendix 1. The complete panel consists of 35,550 observations. \*\*\* and \*\* denote significance at the one and five percent level, respectively.

Having an unemployed father, however, seems to have a negative effect on children's school performance. The estimate suggests that having a short-term unemployed father during upper secondary school decreases the child's GPA by 1.6 percentiles. However, the effect of having a long-term unemployed fa-

ther is not measured with statistical significance. These results could be an indication of the fact that women actually do cope better with being unemployed than men and are able to use their extra time in a productive manner, while the unemployment of the father is predominantly destructive.

It is possible that the positive effect of having an unemployed mother partly depends on her educational level. Quality time with a parent could have a lower value in an educational respect if the parent is low-skilled. To investigate whether parental education has an effect in this respect, I included interactions between parental unemployment and educational level in the specification presented in column 2 above. However, I find no evidence of the positive effect of maternal unemployment depending on the educational level of the mother. Neither is the negative effect of paternal unemployment altered by such interactions. To return to the correlation issue between parental unemployment and the income variables discussed above, the results presented in the last two columns of Table 6 are robust to a step-wise expansion of the specification.<sup>19</sup>

## 4 Sensitivity analysis

### 4.1 The unemployment sample

As mentioned above, the observations determining the coefficient on parental unemployment are the children having experienced an unemployment spell in their family. For the results in this paper to be considered as general, I would have to prove that this sub-sample is representative. I already stated that it is an advantage that this group is large, and that the variation in unemployment during this period can be traced to macroeconomic events, but it is also of interest to consider more detailed characteristics of the sub-sample, as compared to the full sample, to determine whether the unemployment spells during the period can be considered as randomly assigned, i.e. unrelated to family characteristics and the pre-incident youth outcome.

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<sup>19</sup> To appreciate the influence of omitted variables bias, I gradually extend the number of control variables while observing the estimate on parental unemployment. It turns out that the coefficients on maternal and paternal unemployment are robust to the inclusion of other control variables, such as social assistance and disposable income and thus, we believe the correlation problem to be a less serious issue.

**Table 7** Characteristics of children with unemployed parents

	Children, full sample	Children, u-sample	Mother, full sample	Mother, u-sample	Father, full sample	Father, u-sample
GPA	3.643	3.560				
Female	0.497	0.476				
Country of birth:						
Sweden	0.963	0.937	0.900	0.870	0.758	0.751
Nordic	0.006	0.010	0.046	0.056	0.028	0.036
Europe	0.008	0.016	0.030	0.034	0.033	0.039
Outside E	0.023	0.037	0.016	0.033	0.014	0.027
Missing obs.	0	0	0.008	0.007	0.167	0.147
Highest level of completed education:						
Lower secondary			0.175	0.227	0.187	0.241
Upper secondary			0.443	0.522	0.351	0.395
University			0.348	0.215	0.273	0.194
Missing obs.			0.034	0.036	0.189	0.170

Note: U-sample is the children having experienced an unemployment spell in their family; the remaining columns are taken from Table 1 and Table 2. GPA from lower secondary school is mean GPA. Outside E is outside Europe. The complete dataset contains information on 35,550 children, 6,862 of whom experienced parental unemployment between 1990 and 1993.

Table 7 presents descriptive statistics on the unemployment sub-sample, along with the statistics from Table 1 and Table 2 on the full sample. As can be seen, the unemployment sample exhibits a lower secondary school GPA, which is on average only marginally lower than that in the full sample. There are also relatively small differences in the number of females and the country of birth for both the children and the parents. It is, however, clear that the parents in the unemployment sub-sample are in general less educated.<sup>20</sup> This comes as no surprise, since unemployment rates are generally higher among low-skilled workers. This pattern would, however, most likely be even more evident with data from another time period when unemployment rates were lower. Finally, it

<sup>20</sup> These differences are statistically significant.

is worth noting that the number of missing observations on the characteristics of the parents is, somewhat surprisingly, marginally smaller for the unemployment sample. These statistics imply that the unemployment sample is not entirely representative. Hence, my results cannot be considered as representative for the whole population.

## **4.2 The excluded children**

As mentioned above I have, due to heterogeneity, excluded all children not choosing to attend a three-year upper secondary school program directly after lower secondary school and actually managing to complete the program in three years. This means that I have excluded children choosing to attend a shorter upper secondary school program and children choosing to postpone their upper secondary school for some reason, or who simply drop out of school. One can imagine that the children I have excluded might have high probabilities of living in a problematic family. For example, it is very likely that the parents of the excluded children are less educated than the parents of the children choosing a three-year program and consequently, have higher probabilities of becoming unemployed.



**Table 8** Comparing children and family characteristics

	Children					Mother					Father				
	Full sample	Before 1993	1994-1999	Drop-outs	Missing obs.	Full sample	Before 1993	1994-1999	Drop-outs	Missing obs.	Full sample	Before 1993	1994-1999	Drop-outs	Missing obs.
Female	0.497	0.441	0.472	0.479	0.564										
Country of birth:															
Sweden	0.963	0.953	0.898	0.890	0.892	0.900	0.847	0.801	0.741	0.683	0.758	0.763	0.708	0.618	0.666
Nordic countries	0.006	0.009	0.011	0.015	0.010	0.046	0.058	0.050	0.069	0.043	0.028	0.036	0.024	0.040	0.027
Europe	0.008	0.006	0.015	0.014	0.011	0.030	0.024	0.034	0.033	0.025	0.033	0.022	0.030	0.024	0.025
Outside Europe	0.023	0.026	0.060	0.060	0.035	0.016	0.015	0.041	0.047	0.020	0.014	0.014	0.036	0.041	0.019
Missing obs.	0	0.005	0.015	0.022	0.052	0.008	0.058	0.074	0.110	0.230	0.167	0.166	0.198	0.277	0.264
Education:															
Lower secondary						0.175	0.303	0.172	0.338	0.157	0.187	0.311	0.176	0.303	0.178
Upper secondary						0.443	0.492	0.397	0.411	0.367	0.351	0.410	0.341	0.323	0.337
University						0.348	0.145	0.351	0.134	0.244	0.273	0.111	0.281	0.091	0.218
Missing obs.						0.034	0.060	0.079	0.118	0.232	0.189	0.168	0.202	0.282	0.267

Note: Full sample refers to the full sample I use in this study, before 1993 refers to the children attending a shorter upper secondary school program which they completed before 1993, 1994-1999 refers to the children completing some kind of upper secondary school program between 1994 and 1999, drop-outs refers to the children who had still not completed an upper secondary school program in 1999 and missing observations refers to the children that completed a three-year upper secondary school program in 1993 displaying missing observations on key-variables.

In total, there were 109,392 children completing lower secondary school in 1990. Out of these, there were 53,000 (48.4 %) children completing upper secondary school in 1993, 31,384 (28.7 %) attending a shorter upper secondary school program which they completed before 1993 and 8,534 (7.8 %) children completing some kind of upper secondary school program during the period 1994 to 1999. 16,474 children (15.1 %) had still not completed an upper secondary school program in 1999, here called dropouts. For 11,700 of the 53,000 children completing upper secondary school in 1993, I have missing observations on key-variables, here called the missing observations group. The missing observations are mainly on the disposable income of the family or the family structure (whether the child lives with both his biological parents). Table 8 contains comparable descriptive statistics for the groups of children discussed above.

Worth noting is that the number of missing observations on the parents' characteristics is larger for all other groups as compared to the one I study (however, only marginally so for the group of children completing upper secondary school before 1993). As commented above, these missing observations to a large extent stem from the fact that information on both parents is only included when children live in the same household as both parents. Hence, more missing observations on the parents' characteristics most likely indicate that a larger proportion of these children have divorced parents when completing lower secondary school as compared to the children I study. The proportion of missing observations on the characteristics of the father is the largest among the dropouts and for mothers, there are most missing observations in the group I have excluded because of many missing observations on key-variables.

Further, there seems to be a smaller proportion of children born abroad among the children choosing to go through with an upper secondary school program directly after lower secondary school (i.e. those completing upper secondary school before 1994). The same pattern seems to hold for parental nationality. Considering parental education, the groups completing a shorter upper secondary school before 1993 and the dropouts have the least educated parents. The remaining groups have similarly educated parents.

It seems that the children in the group I study live in families with relatively highly educated parents, and that the proportion of children living in divorced families is probably smaller than in the other groups. Therefore, it can only be assumed that my estimated effects of parental unemployment on children's school performance hold for children living in relatively stable families. To

make any suggestions regarding these effects for children in more problematic families, this group must be investigated separately. However, one can imagine that children living in more problematic families would, to an even larger extent, be affected by additional strains on the family.

## 5 Conclusions

As far as I am aware, this is the first paper investigating the effect of parental unemployment on children's school performance. The empirical method builds on the idea that lower secondary school GPA can be used to control for family and individual heterogeneity. I use data on children completing lower secondary school in 1990 and thereafter directly continuing with three years of upper secondary school.

My main results can be summarized as follows. If a mother is subjected to an unemployment spell during the period when one of her children attends upper secondary school, the school performance of the child marginally improves. This implies that the positive effect of having extra time on your hands exceeds the negative effects of the disadvantages caused by unemployment. However, having an unemployed father has a negative effect on a child's school performance. When separating paternal unemployment into short- and long-term unemployment it turns out that short-term unemployment exhibits the statistically significant effect. This could be interpreted as the shock of the unemployment wearing out. One explanation for the differing results across genders could be that women in general cope better with being unemployed and hence, are able to use their new extra time doing something productive, such as spending quality time with their children.

Given that this is the first paper analyzing the relationship between parental unemployment and children's school performance, it seems appropriate to mention issues that have not been addressed in this paper as suggestions for future research. To generalize the effect of parental unemployment on children's school performance, one would need to consider the relationship for children choosing to never attend upper secondary school, dropping out of upper secondary school or attending a shorter upper secondary school program. It would also be interesting to consider the relationship between parental unemployment and children's school performance during a period with lower unemployment rates. As discussed earlier, it could be the case that being unemployed when

unemployment rates are low is associated with higher social and psychological costs of being unemployed, making it more difficult to use your new extra time to help your children.

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# Appendix

## A.1 Results for control variables in Table 6

**Table A1** Results for control variables corresponding to the results in Table 6

Specification	Mother/father	Short-term/Long-term
GPA percentile,	0.682***	0.682***
lower secondary school	(0.004)	(0.004)
Separation	-1.721*	-1.718*
	(0.907)	(0.906)
Move	-1.049	-1.045
	(0.863)	(0.862)
Disposable income	0.722	0.721
	(0.553)	(0.553)
Social assistance	-4.021***	-4.032***
	(0.400)	(0.400)
Children	-0.007	-0.007
	(0.235)	(0.235)
Child nationality, not Swedish	-2.963***	-2.973***
	(0.674)	(0.674)
Parental nationality:		
Europe	0.480	0.478
	(0.378)	(0.378)
Outside Europe	0.659	0.622
	(0.916)	(0.917)
Parental education:		
Secondary	1.471***	1.473***
	(0.386)	(0.386)
University	5.386***	5.389***
	(0.393)	(0.394)

Note: Standard errors are in parenthesis. All standard errors are robust to heteroscedasticity. In addition to the variables shown in the table, all regressions include a municipality-specific effect. The complete panel consists of 35,500 observations. \*\*\*, \*\* and \* denote significance at the one, five and ten percent level, respectively.

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