

Turku Center for Welfare Research  
Working Papers on Social and Economic Issues 2/2017

**Less Advantaged More Averse? Heterogeneous  
Effects of Parental Unemployment on Siblings'  
Educational Achievement**

**Hannu Lehti, Aleksi Karhula, Jani Erola**



Turun yliopisto  
University of Turku



# Less Advantaged More Averse? Heterogeneous Effects of Parental Unemployment on Siblings' Educational Achievement

Hannu Lehti, Jani Erola & Aleksi Karhula

## Abstract

Literature on the effects of parental unemployment on children's attainment has shown convincingly that parental unemployment has short-term negative effects on children. However, the long-term effects on children's attainment are more mixed. One potentially important limitation of previous studies has been that they have ignored the heterogeneous effects of parental unemployment. We study parental unemployment and children's enrollment in higher education by comparing the effects according to the children's age of exposure (0–18) and the parental level of education (basic, secondary and tertiary). The topic is analyzed using Finnish register data on 23,328 children in 10,609 families by employing sibling fixed-effect models. Our results suggest that parental unemployment has negative effects on children's educational achievement and that the effect is more detrimental just before educational transitions at ages 14–15 and 18. The effect of unemployment on children's higher educational achievement is negative in families with secondary- and higher-educated parents but not among compulsory-educated parents. Higher-educated parents are not able to compensate for the negative effects of unemployment. Detailed analysis of the mechanisms suggests that the reduced amount of parental economic resources or cumulative disadvantages due to unemployment cannot explain the effects, but a child exposed to parental unemployment becomes more risk averse toward higher education.

## Introduction

Previous literature has shown that parental unemployment has short-term negative effects on children. Parental unemployment has been associated with lower self-esteem and well-being, higher school dropout rates, lower academic expectations, less educational success and poorer health among children (for a review, see Brand 2015). However, the evidence on long-term effects on children's life-course and socioeconomic attainment is somewhat mixed. Some studies find that parental unemployment has a negative effect on children's income, education and social status (e.g., Oreopoulos et al. 2008; Rege et al. 2011; Brand and Thomas 2014; Coelli 2011; Karhula et al. 2015); however, others have failed to show such a relationship (e.g., Bratberg et al. 2008; Ekhaugen 2009).

One possible explanation for the mixed evidence on long-term effects is that previous studies have not considered the potentially heterogeneous effects of parental unemployment on children's outcomes. The heterogeneity may occur in different ways. For example, earlier studies particularly suggest that the early economic resources of a family are decisive for later educational and socioeconomic outcomes (Duncan and Brooks-Gunn 2000). However, educational choices are made during adolescence, and thus parental unemployment in later youth may also have an impact on children's future prospects and educational choices (cf. Erikson and Jonsson 1996). Furthermore, parents differ in their ability to compensate for the disadvantages following their unemployment. Highly educated parents are likely to have multiple types of resources, and even if unemployment is followed by a reduction in economic resources, parental

human and, to some extent, social capital are likely to remain (cf. Ström, 2003; Bernardi, 2012; Prix and Erola 2016).

In this article, we explore the possibility of distinguishing between different types of heterogeneity to study the mechanisms behind the intergenerational effects of parental unemployment. It has typically been argued that the negative effects are not directly related to unemployment as such but rather to the economic consequences for families (Jahoda 1982; Oreopoulos et al. 2008; Rege et al. 2011; Galambos and Silbereisen, 1987; Coelli 2011). In contrast, some studies have suggested that the effects are not related to family income but rather to the other negative effects of unemployment experienced within a family, such as status loss, reduced family cohesion or weakened parenting (e.g., Brand and Thomas 2014; Anderssen 2013; Powdthavee and Vernoit 2013).

We study the heterogeneous effects of parental unemployment on children's educational achievement in Finland. We distinguish the effects according to children's age at first occurrence of parental unemployment and parental level of education. We conduct our analyses using high-quality Finnish register data, including reliable annual indicators of parental unemployment, education and income, and other family-level factors, such as parental dissolution. Using linear probability sibling fixed-effect models, we can disentangle many identification problems following from selection bias, which many previous studies on the topic have ignored.

We begin by discussing in more detail how intergenerational attainment can be influenced by parental unemployment.

## Resources and Well-being

### Family Income

One of the most obvious results of parental unemployment is reduced economic resources available for the family. The negative income effects are not restricted to the period when a person remains unemployed. For instance, Gangl (2006) has shown that in both the US and Western Europe, unemployment reduces not only a worker's immediate earnings but also his or her subsequent earnings. Lower parental earnings limit parents' opportunities for financial support and children's access to material resources.

There is some empirical evidence supporting the assumption that the negative intergenerational effects are at least partially related to the family's reduced economic resources. Coelli (2011), using longitudinal data from Canada, found that parental job loss at high school age (16–17) reduced children's post-secondary education enrollment. He attributed this result to the income loss of the unemployed parents. This finding is consistent with an earlier finding from the US showing an association between parental income during high school and college attendance (Jencks and Tach 2006). Similarly, Kalil and Ziol-Guest (2008), applying US survey data, found an association between a father's job loss and children's grade repetition and school suspension.

In the literature, the effect of economic resources on education is usually explained with parents' potential to invest these resources in their children and the material endowments available for the children to use for their own good (e.g., Becker and Tomes 1976). It has been argued that the rates of return on investments in

disadvantaged children's human capital have a declining curve by the children's age. Investments during early childhood produce greater returns than those taking place later in life (Heckman 2006). Some studies have even suggested that reduced parental income can have a causal negative effect on children's cognitive achievement. These effects are even greater for children growing up in more disadvantaged families and matter more if experienced during early childhood (Brooks-Gunn and Duncan 1997; 2012; Duncan et al. 1998). Therefore, we expect the following:

*If the negative effect of parental unemployment on children's educational achievement is due to parental economic resources, it matters more if experienced during early childhood.*

Given the economic nature of the effect, it naturally also follows that the negative effect disappears when controlling for differences in parental income.

### **Resource Compensation**

The previous studies do not provide conclusive support for an economic explanation of the negative impact of parental unemployment. For instance, Rege et al. (2011) found a negative effect between parental unemployment and children's educational performance; however, it was unrelated to family income. Sometimes the negative effect is missing altogether, such as in the case of identifying a causal effect of parental unemployment on adult children's employment status (Ekhaugen 2015). A potential reason for the deviating results is the institutional context. In the Nordic countries—such as Finland in our study—higher education is free of charge, reducing the

importance of family economic resources in socioeconomic attainment (Erola et al 2016). The previous studies suggest that children from low-income families growing up in the Nordic welfare states have fared relatively well in adulthood (Jäntti et al 2006).

There is another potential reason for the lack of negative effects, namely resource compensation. Not only the existence of a strong welfare state but also parents themselves may be able to compensate for the economic loss with other resources they still have available. These compensatory effects have been reported previously in cases of children's lower academic achievement (Bernardi 2012; Bernardi and Boado 2014), divorce (Bernardi and Grätz 2015; Erola and Jalovaara 2016) and parental death (Prix and Erola 2016). In the case of parental unemployment, we assume that compensation should appear as heterogeneity according to parental education: whereas unemployment may reduce parental income, it does not influence their level of education negatively. This suggests the following hypothesis:

*Higher parental education protects children from the negative effects of parental unemployment (compensation hypothesis).*

Some earlier studies appear to provide empirical support for this type of effect, suggesting that the negative effects are concentrated among disadvantaged families (Levine 2011; Stevens and Schaller 2011). In contrast, the findings of Brand and Thomas (2014) suggest that the negative effects of parental unemployment are greater among children of advantaged families if the level of unemployment in a society is otherwise low.

## Cumulative Disadvantages

According to the so-called Matthew effect, the advantages and disadvantages have a tendency to accumulate: a favorable or unfavorable relative position can be seen as a resource that produces further advantages or disadvantages (DiPrete and Eirich 2006). This means that disadvantageous events, such as unemployment, to which children and families are exposed, may lead to other disadvantages, such as family disruption, reduction of income in the long term and parents' weakened prospects in the labor market. These detrimental events may further constrain the decision making and opportunities of less advantaged individuals.

Indeed, it has been noted that unemployment has a tendency to accumulate and produce other life-course disadvantages. This *scarring effect of unemployment* has been shown to negatively affect long-term labor market attachment (Nilsen and Reiso, 2011), increase family dissolution (Hansen 2005), reduce long-term income (Gangl, 2006) and create health problems (Clark et al. 2001). Although the scarring effect has been earlier associated with individuals experiencing their own unemployment, it may also have an effect at the family level. Thus, we expect that cumulative disadvantages caused by unemployment may strengthen or even explain entirely the negative effect of parental unemployment on children's educational opportunities. Therefore, we suggest the following hypothesis:

*The negative effects of unemployment are either explained or enhanced by other associated disadvantages (cumulative disadvantage hypothesis).*

The disadvantages considered here include lower long-term family income, parental divorce and repeated unemployment spells. Similar to the economic resources



hypothesis, these effects are particularly important if the first unemployment occurs during early childhood simply because that leaves more time to experience other disadvantages during childhood and youth.

## **Expectations and Risk Aversion**

The Breen-Goldthorpe (1997) model on education choices suggests that families from different social backgrounds face different constraints and opportunities in terms of cost and benefits as well as probabilities of successful educational outcomes when choosing among different education options. Educational decisions made in certain transition periods of the life course can be highly consequential in ways that children cannot easily reverse later. The tendency to prioritize avoiding losses rather than acquiring gains when decisions are risky is referred to as risk-averse behavior (Kahneman and Tversky 1979). Additionally, educational decisions are driven by the principle of relative risk aversion (RRA): families tend to prioritize avoiding downward mobility, while upward mobility is only a secondary motive for educational decisions.

Previous studies have shown that parental relative status deprivation caused by unemployment has a negative impact on children's educational ambitions and prospects (Andersen 2013). Thus, signals of increased risk aversion may particularly apply to choices regarding higher education. Psychological studies have pointed out that the higher stress following from unemployment is likely to lead to "habitual" rather than goal-oriented choices (Haushofer and Fehr 2014). Thus, as a consequence of parental unemployment, children may lower their expectations about the value of education, and their educational paths may become shorter (Brand 2015).

By applying risk aversion in the context of parental unemployment, we assume that uncertainty following it within a family modifies children's risk aversion. Parental unemployment increases children's expected cost of education and decreases perceived probabilities of successful outcomes. By choosing a more rapid transition to the labor market, children may feel that they are reducing uncertainty and avoiding further losses.

Educational decision making should yield heterogeneity according to family background. The children of lower-educated parents have higher risk aversion toward higher education independent of parental unemployment (see, e.g., Breen and Yaish 2006). In contrast, the children of higher-educated parents are less risk averse but are exposed to greater status decline when facing parental unemployment. We suggest the following hypothesis:

*The negative effect of parental unemployment on children becomes stronger as the parental level of education increases, and it is more detrimental just before educational transition periods.*

Relative risk aversion can also have a different type of impact. Higher educational background may compensate for the negative effects of parental unemployment for children. If this is the case, children of higher-educated parents experiencing unemployment should be particularly selective about the field of education but in general not more likely to choose lower education level. If this holds, the negative effect of parental unemployment should only be observed among children of middle-educated parents.

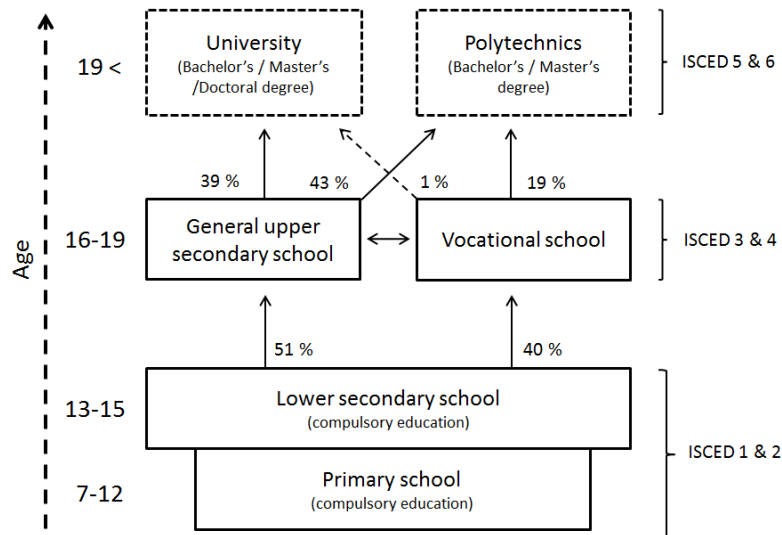
## Finland as an Institutional Context

The analysis in this study is conducted using Finnish register data. The educational system in Finland—as in the Nordic countries in general—is fairly equal. International comparisons of socioeconomic inheritance have found the Nordic countries, including Finland, to be among the most egalitarian (Björklund et al. 2002; Breen, 2004; Erola, 2009). If negative effects of parental unemployment are found in Finland, it can be assumed that in other contexts—for example, where education comes with financial costs—the negative effect is even more pronounced.

Figure 1 summarizes the Finnish educational system. Mandatory comprehensive school begins at age 7 and continues until age 15. The most significant transition occurs after this period, when children choose an academic (general upper secondary) or vocational track, each lasting approximately 3 years. It is also possible to drop out after completing comprehensive school and not continue with secondary education; however, only a small minority chooses to do so. In our dataset, approximately 51 % attended general upper secondary school, approximately 40 % attended vocational secondary school and approximately 9 % did not continue to any secondary-level schooling.

After general upper secondary school, students often continue on to study at universities (mostly master's level courses) or polytechnic schools (mostly bachelor's level courses). Figure 1 shows that 39 % from general upper secondary school attended universities and 43 % polytechnics. Thus, 18 % did not choose to continue to tertiary-level studies from the upper secondary level. From vocational secondary school, approximately 19 % continued to polytechnics and only 1 % to universities. From

vocational school, approximately 79 % did not continue on to study at the tertiary level at all. In our entire sample, 20 % attended universities and 29 % polytechnics.



**Figure 1. Summary of Finnish education system and children’s age at the different educational levels (Source: Ministry of education and culture 2015 and own calculations)**

In Finland, the educational system is free of charge at all levels, including tertiary education, and studies are subsidized by student grants and subsidized student loans. The state, together with unemployment funds, provides social security for unemployed individuals. If the duration of employment before the start of unemployment has been at least ten months, the employee is entitled to an earnings-related unemployment allowance for 500 days of continuous unemployment. Typically, the amount of this benefit is approximately 70 percent of the recipient’s pay prior to the start of

unemployment. After 500 days, the benefits decrease to approximately one-third of the individual's average pay. This amount is assumed to meet the family's minimum economic needs.

## **Data and Methods**

### **Methodological Design**

One of the most obvious problems in studying the association between parental unemployment and children's later attainment is selection bias. Unemployment is not a random event; however, individuals with other disadvantageous characteristics are likely to self-select into unemployment. Thus, confounding factors may be behind the relationship between parental unemployment and children's educational achievement. If these factors are unobservable, the direct causal effect of unemployment cannot be observed even if the association is found. Selection bias can lead to overestimation of the negative effect or, even worse, wrong conclusions about the relationship between parental unemployment and children's educational achievement.

In this study, we employ sibling fixed-effect models to control for the potential bias caused by unobserved confounding factors. This means that any family background-related effects shared by siblings, observed or unobserved, are controlled for in the models. Thus, our models yield less biased estimates than regular (between-individual) regression estimates. By controlling unobserved confounding variables at the family level, the sibling fixed-effect technique reduces the unobservable heterogeneity problem and can be seen to more accurately reflect the direct causal relationship between independent and dependent variables (see, e.g., Sigle-Rushton et al., 2014).

The sibling fixed-effect model has been considered a simple extension of the matched case-control design. It automatically controls many unmeasured factors at the family level. In our case, these unobserved factors are a family's shared cultural capital, parental characteristics, such as education, child-rearing practices (if the same for all siblings), neighborhood effects and even some genetic variance (Frisell et al., 2012).

In sibling fixed-effect models, children are nested into their families. We use linear probability models to estimate average marginal effects of our outcome variable between siblings, controlling for all the factors that are constant between siblings. We compare sibling fixed-effect models with regular linear probability OLS-regression models to show how much unobservable heterogeneity is reduced with the method. The sibling fixed-effect models are estimated with the following equation:

$$Y = \beta X_{if} + \gamma Z_{if} + \alpha_f + u_{if}$$

Here,  $f$  refers to a family and  $i$  a sibling. The vector  $\beta X_{if}$  is a set of dummy variables of parental unemployment at a certain age of the sibling, and  $\gamma Z_{if}$  refers to the vector of sibling-specific control variables.  $\alpha_f$  is the family-specific intercept, which is constant between siblings controlling all factors that are invariant on the family level, and  $u_{if}$  is the within-sibling error term.

Although sibling models are an efficient method to control for omitted variable bias at the family level, they also have certain limitations. First, there may be confounding factors that vary between siblings but are not controlled for unless included as observed controls. Second, sibling fixed-effect models can only be estimated among families with at least two children. Thus, one-child families are omitted from the data. Third, sibling

fixed-effect models cannot control for reverse causality. For example, a child's poor health or the birth of a younger sibling may affect a parent's decision to become unemployed. By including certain sibling-specific control variables, such as a child's year of birth and siblings' birth order, and comparing multiple-child family samples to a one-child family sample (as well as a sample including both multiple- and one-child families), some of these problems can be overcome (see, e.g., Sigle-Rushton et al., 2014; Grätz 2015).

### **Dependent and Independent Variables**

Because sibling fixed-effect models control for everything that is shared by siblings, and parental unemployment is experienced by all siblings at the same time, we identify the effect of parental unemployment according to the children's age at first experience. Our main explanatory variable is therefore the *age exposed to parental unemployment*. We use both paternal and maternal unemployment for this indicator<sup>1</sup>.

We measure the age of exposure with 15 dummy indicators: the first parental unemployment when children were 0-4, 5-6 or any (annual) age from 7 to 18. The reason we omit annual information before age 7 is gaps in the data: the dataset includes a 5-year gap between the years 1980-1985 and a one-year gap between the years 1985-1987. By applying the same dummy variables to all the cases, we are able to estimate the effect of the exposure to parental unemployment at particular ages before educational choices on tertiary education were made.

---

<sup>1</sup> We conduct separate analyses for families where only the father or mother experienced unemployment and find that both have negative effects on children's educational achievement. See Appendix Table 1.

The siblings who were over age 18 and enrolled in tertiary education before parental unemployment or born after parental unemployment are assigned to the reference (or control) group. Those who were over age 18 and enrolled in tertiary education *after* parental unemployment are omitted because they were exposed to parental unemployment before tertiary enrollment but after secondary education (age 18).

The age exposed to parental unemployment can be considered a very suitable variable to measure the effects of parental unemployment because it has been shown that the negative effects of parental unemployment on children's school outcomes depends on the age when children experience it (Brand and Thomas, 2014). Furthermore, other disadvantageous life-course events, such as divorce (Sigle-Rushton, et al. 2014; Grätz 2015) and poverty (Duncan and Brooks-Gunn 2000), have also been shown to be dependent on a child's age. For instance, Sigle-Rushton et al. (2014) applied sibling fixed-effect modeling to explore the effects of parental dissolution on children's school grades.

Our dependent variable, *children's tertiary educational achievement*, is measured by enrollment in tertiary education (ISCED-levels 5 & 6) after upper secondary school (vocational or academic) when children were ages 19–23. Educational achievement is followed until age 23 because in Finland it is typical to take a break of at least one year between secondary school and tertiary education (for men, it is mandatory to enter the army or civil service). Furthermore, in some very desirable higher educational fields (for example, medical science), it is typical for applicants to take the entrance exam at least a couple of times before achieving the required score for entry.



## Control Variables

We control for the set of variables between siblings that are associated with children's educational achievement and parental unemployment. Our baseline sibling fixed-effect models control for the child's sex and year of birth and siblings' birth order (first, second or higher parity). We control these factors because they vary between siblings and have been shown to impact educational achievement (e.g., Andersen 2013; Sigle-Rushton et al. 2014; Ekhaugen 2007; Härkönen 2014; Brand and Thomas 2014). Additionally, in OLS-regression models, we control for parental education and family type (intact or non-intact family) during parental unemployment. These variables are constant between siblings and thus controlled automatically in the sibling fixed-effect models.

The baseline fixed effects models—where we control for the child's sex and birth year and siblings' birth order—are compared to the additional models to test our hypotheses. In the additional models, we control for the average annual household income, using logarithmic scale, when the children were ages 0–18, children's age when facing parental divorce after unemployment and children's age when experiencing a second parental unemployment spell. To construct both of the latter variables, we apply all the available information when the children were ages 0–19. By controlling these variables, we are able to test whether parental long-term income reduction and cumulative disadvantages are the key explanatory mechanisms behind the potential effects of parental unemployment on children's educational achievement.

We are not able to control the parental educational level in our sibling models because it is constant between siblings. Thus, to compare the results by parental education, we

must run separate sets of models. To do so, we distinguish three levels of parental education:

(I) Compulsory level or less (ISCED 1)

(II) Secondary (ISCED 2–4)

(III) Tertiary (ISCED  $\geq 5$ )

The information on parental education is acquired from the same year as when one of the parents experienced unemployment. If the value is missing, we replace it with a previous value before unemployment. For those children who did not experience parental unemployment, we take the highest level of education when the children were ages 0–18. Parental educational level is classified according to the dominance principle.<sup>2</sup> By distinguishing these educational levels, we are able to study compensation mechanisms and risk aversion theories.

### **Register data and descriptive statistics**

We use a register-based *Finnish Growth Environment* dataset. The dataset is based on a 10 % sample of the Finnish population of 1980 that is matched with all the children born in 1980–1987. In the dataset, unemployment is measured in months registered with the employment office within a year and does not suffer from memory bias or other similar human errors that plague survey studies with retrospective design. Due to the existence of unemployment benefits, it is very rare for unemployed Finns not to register as such.

---

<sup>2</sup> Because either the mother or father can be unemployed, we also classify parental education level according to both parents, analysing only families where both parents have the same education level. We do not find significant differences, as reported in the results section.

A parent is defined as unemployed if unemployment continues for more than 6 months during a year. This is done to exclude parents with short transitory periods of unemployment and employed parents with regular seasonal (summer or winter) unemployment. Some previous studies have applied a similar definition of parental unemployment (see Eghaugen, 2009). Because unemployment may have detrimental effects on health, we exclude the parents who were unemployed due to a disability.

The final sample covers 83,731 children in 60,892 families, of which 51 % of the children experienced unemployment<sup>3</sup> when they were ages 0–18. This covers 55 % of the families. This so-called full sample also includes one-child families and is used in the linear probability OLS-regression analyses. After dropping singletons and siblings who lack variation (mostly twins in two-sibling families) from the dataset, our final analytical fixed effect sample covers 23,328 children in families. To reduce genetic variance in our analysis, the samples cover only biological siblings. Siblings included in the analytic sample lived in the same household with a parent (either a biological or a step-parent) who experienced unemployment and were exposed to parental unemployment in the same year.

Furthermore, we compare our full and sibling fixed-effect sample to the restricted sample, which includes only families where at least one of the siblings was in the control group<sup>4</sup> not exposed to parental unemployment. We do this because in this restricted sample, the effect between siblings is not due to siblings' ages when they experienced unemployment but rather whether they were exposed to parental unemployment (or not). This sample simply divides siblings into the treatment (parental

---

<sup>3</sup> This number may seem large; however, Finland experienced a very severe recession at the beginning of 1990, and the unemployment rate rose to 20 %, still exceeding 10 % at the end of 1990 (for more information, see Karhula et al., 2015)

<sup>4</sup> Born after or tertiary enrollment before parental unemployment.

unemployment) and control (no parental unemployment) groups, controlling family background factors. If the effects in the analytic sibling fixed-effect sample and restricted sample yield similar estimates, then the age of exposure to parental unemployment can be considered a well-suited variable to measure the effects of parental unemployment.

Descriptive statistics of our three different samples in Table 1 show that our dependent and independent variables are close to each other in every sample. The samples do not suffer from selection bias by family- or individual-level background variables.

## **Results**

We begin the results section by showing the average effects of parental unemployment on children's tertiary education. We use three different samples to estimate these effects: The full sample is used to estimate regular OLS-regression results, the analytic sibling sample for fixed-effect models and the restricted sample including only families where at least one of the siblings was exposed to parental unemployment after enrolling in tertiary education or born after unemployment.

Table 2 shows that parental unemployment is disadvantageous for children even when unobserved heterogeneity is controlled with sibling effects models. In regular OLS-models with observed family background controls, the difference between siblings is 16 percentage points. The average difference between a sibling who suffered parental unemployment and one who did not is approximately 8 percentage points. The analytic

**Table 1. Descriptive statistics (means) of applied variables in analysis according to three different samples.**

| VARIABLE   | Full Sample | Sibling FE sample | Restricted sample |
|--|-------------|-------------------|-------------------|
| Tertiary education enrollment                          | 0,49        | 0,42              | 0,59              |
| Mean age exposed to parental unemployment <sup>a</sup> | 8,87        | 8,76              | 11,58             |
| Exposed to parental unemployment <sup>b</sup>          | 0,5         | 0,93              | 0,18              |
| Intact family type <sup>c</sup>                        | 0,84        | Na.               | Na.               |
| Mean family income at 0-18 years old                   | 51,575      | 43,572            | 54,408            |
| Mean age exposed to 2. par. unemp. spells <sup>a</sup> | 10,25       | 10,2              | Na.               |
| Mean age exposed to parental dissolution <sup>d</sup>  | 11,38       | 12                | Na.               |
| Sibling order  |             |                   |                   |
| 1  | 0,44        | 0,34              | 0,3               |
| 2  | 0,36        | 0,41              | 0,36              |
| 3 or more  | 0,20        | 0,24              | 0,34              |
| Year of birth  |             |                   |                   |
| 1980   | 0,12        | 0,1               | 0,13              |
| 1981   | 0,12        | 0,11              | 0,11              |
| 1982   | 0,13        | 0,13              | 0,13              |
| 1983   | 0,13        | 0,14              | 0,14              |
| 1984   | 0,13        | 0,15              | 0,13              |
| 1985   | 0,13        | 0,14              | 0,13              |
| 1986   | 0,12        | 0,12              | 0,11              |
| 1987   | 0,12        | 0,12              | 0,13              |
| Father's education                                     |             |                   |                   |
| Compulsory   | 0,24        | 0,25              | 0,2               |
| Upper secondary  | 0,43        | 0,47              | 0,42              |
| Tertiary   | 0,34        | 0,28              | 0,39              |
| Mother's education                                     |             |                   |                   |
| Compulsory   | 0,20        | 0,21              | 0,15              |
| Upper secondary  | 0,44        | 0,49              | 0,44              |
| Tertiary   | 0,36        | 0,3               | 0,41              |
| Female   | 0,49        | 0,49              | 0,51              |
| <i>N</i>   | 83708       | 23328             | 2103              |

<sup>a</sup> 15 dummy variables used in the analysis

<sup>b</sup> In the sibling sample and the restricted sample, all the families experienced parental unemployment

<sup>c</sup> Not applied in the sibling and restricted samples due to lack of variance

<sup>d</sup> Parental dissolution measured after parental unemployment

sibling fixed-effect sample and the restricted sample yield very similar estimates. The comparison between models suggests that approximately half of the average effect of parental unemployment is indirectly due to the unobserved heterogeneity.

Figure 2 shows the results of sibling fixed and regular OLS-regression models by children's age when exposed to parental unemployment, with and without the baseline controls. Regular OLS-regression estimates, which are acquired from the full dataset, show that parental unemployment has a negative effect on children's tertiary educational achievement at every age. Controlling for other background variables reduces the effects only slightly. OLS-estimates show that parental unemployment is most disadvantageous for children's educational achievement if experienced in early childhood.

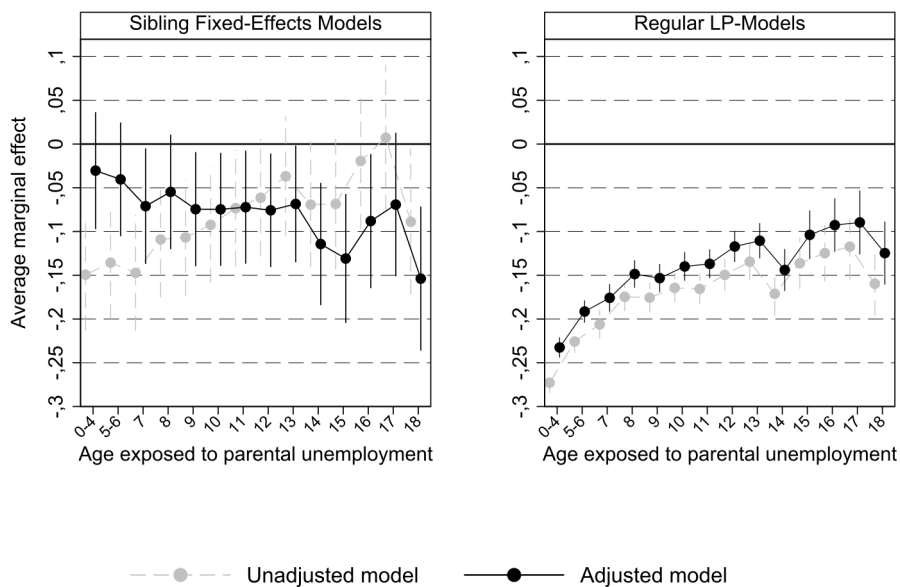
However, sibling fixed-effect models show that a considerable part of the variation by the age of exposure is due to unobserved heterogeneity in the regular OLS-estimates. When we add baseline controls to an "empty" FE model, the age effect decreases even further, especially in early childhood (when children are under 7). After controlling for sibling-level individual factors, the negative effect is no longer statistically significant at these ages<sup>5</sup>. The results suggest that approximately  $\frac{2}{3}$  of the effect comes from measured differences between siblings (for example, parity and gender) and does not result from parental unemployment. We do not see the same type of difference between unadjusted and adjusted models when children are teenagers (ages 14-18). In contrast, the effect becomes somewhat stronger when controls are applied.

In the adjusted sibling models, the effects are rather flat over children's age but not statistically significant if unemployment is experienced during childhood. However, parental unemployment seems to be disadvantageous when children are ages 14-15 (approximately 10 percentage points between siblings). At this age, children (or their

---

<sup>5</sup> We also conducted a  $\chi^2$  - test and found that exposure to parental unemployment is statistically significant at every age but not under 7 years old (Appendix Table 2).

parents) decide whether they continue to a vocational or academic track (upper secondary school). A similar difference can be seen when children are first exposed to parental unemployment at age 18. This indicates that parental unemployment is more consequential for children if first experienced at the educational branching points of the early life course.



**Figure 2. Age exposed to parental unemployment predicting tertiary educational achievement (AMEs). Regular OLS and sibling fixed-effect linear probability regression models with and without controls. Adjusted models control for: child’s sex, sibling birth order and year of birth. In addition regular LP-models control for parental dissolution and parental education.**

### Cumulative Disadvantages or Long-Term Family Income?

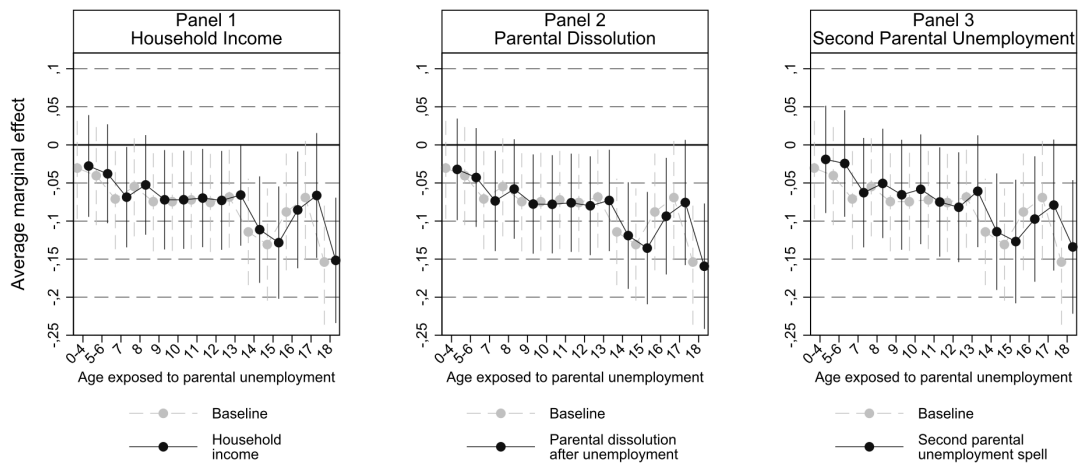
Next, we analyze whether family income and the ages of facing parental divorce after unemployment or a second parental unemployment spell explain the negative effect of

parental unemployment on children's educational achievement. These analyses aim at further understanding the key explanations for the effect of parental unemployment, such as cumulated effect of parental unemployment and family resources.

Figure 3 shows how much these models explain the negative effect after controlling one of these variables. First, we control for average family income when children are ages 0-18. Panel 1 shows that family income does not explain the negative effect (the black and gray lines overlap). Also, the estimate for income is small and statistically insignificant (see online Appendix Table 2). We also control for mean family income both before and after parental unemployment (results not shown); however, again we do not find any mediating effects of these family income variables. Furthermore, we analyze only those siblings whose long-term family incomes differ by income quintile because it may be argued that there is not enough variation among siblings' family incomes in the entire sample. We do not find a mediating effect of family income in this analysis either.

In Figure 3, panels 2 and 3 show similar results. Parental dissolution after unemployment also has a limited ability to mediate the effect of parental unemployment on children's educational achievement. Additionally, in this case, the independent effect is insignificant (see online Appendix Table 2). In panel 3, we control for second parental unemployment spell. It can explain slightly more than family income and parental dissolution, especially if parental unemployment is experienced during early childhood; however, the mediating effect is again small. These results indicate that the reduction of parental long-term income, parental dissolution or a second unemployment spell is unable to mediate the disadvantageous effect of parental unemployment on children's tertiary education. Thus, we cannot find support for an economic explanation or the cumulative effects hypothesis.





**Figure 3. Mediating effects of long-term family income, parental dissolution and second parental unemployment spell on tertiary educational achievement, sibling fixed-effect linear probability models. Models control for: child’s sex, sibling birth order and year of birth**

### Parental education

Finally, Figure 4 shows the effects of parental unemployment according to parental education level. The first panel on the left shows, that there is no effect between parental unemployment and children’s educational achievement among compulsory-educated parents at any age. In contrast, the middle panel shows that there are no effects among the children of secondary-educated parents if the unemployment is first experienced when the children are under age 14 but a substantial negative effect when children are exposed to parental unemployment at ages 14–15 and a similar effect at age 18. Furthermore, panel 3 shows that there is a negative, statistically significant effect among children of higher-educated parents at age 15 and a much larger negative effect at age 18.

Thus, parental unemployment appears to be disadvantageous for children coming from more advantaged educational backgrounds. The children of secondary-educated and higher-educated parents have a lower probability of entering higher education if they have been exposed to parental unemployment. Unemployment is even worse during the time when children are teenagers and making educational choices related to entering tertiary education. These results support the risk aversion hypothesis: children with low-education backgrounds are unaffected by parental unemployment, whereas children from more educationally advantaged family backgrounds are more sensitive to parental status deprivation caused by unemployment, especially in the decisive transition periods. We do not find support for the assumption that higher-educated parents can compensate for the negative effects of parental unemployment.

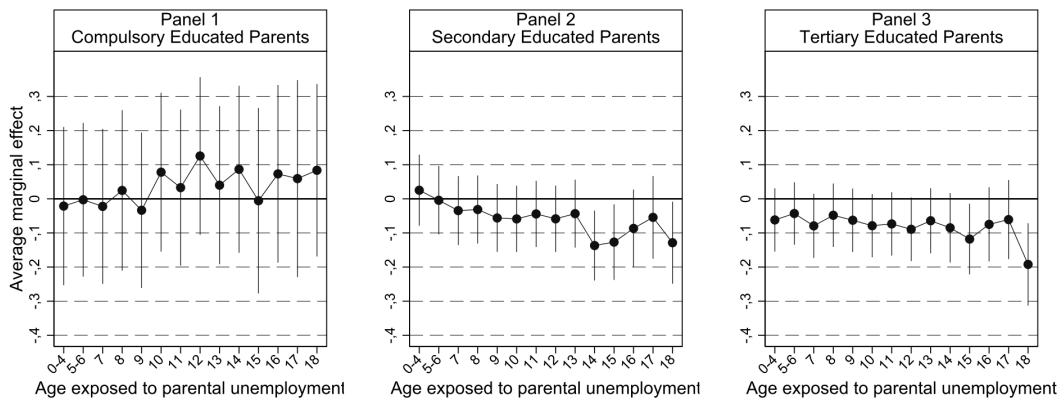


Figure 4. Age exposed to parental unemployment by parental level of education predicting tertiary educational achievement, sibling fixed-effect linear probability models. Models control for: child's sex, sibling birth order, year of birth and household income.

## Analyses of robustness

Because our analysis also covers children who experienced parental divorce before parental unemployment, and the parents who were unemployed were not always biological parents in our analyses, we conduct sensitivity analyses only for the cases that lived in intact two-biological-parent families. In these analyses, we do not find any significant differences from the results reported above.

One of the caveats of sibling fixed-effect models is that we must limit our sample to families with at least two siblings, and the results cannot be generalized to one-child families. Thus, we compare the sibling and full samples to the one-child family sample by conducting regular linear probability OLS-regression for all the samples individually. Table 3 shows that in all the samples, estimates are very close to each other. Thus, the results do not seem to be considerably biased by excluding the singletons.

**Table 3. Results of linear probability models (OLS) using full, sibling and one-child samples**

|                       | Full sample | Sibling sample | One-child sample | Full sample | Sibling sample | One-child sample |
|-----------------------|-------------|----------------|------------------|-------------|----------------|------------------|
| Parental unemployment | -0,193***   | -0,215***      | -0,211***        | -0,160***   | -0,170***      | -0,193***        |
|                       | 0,003       | 0,012          | 0,009            | 0,003       | 0,012          | 0,005            |
| Basic controls        | NO          | NO             | NO               | YES         | YES            | YES              |
| N                     | 83708       | 23312          | 12734            | 83708       | 23312          | 12734            |

We also conduct interaction between the sex of a child and parental unemployment and find that it is statistically non-significant. This indicates that there are no real differences between sons and daughters; parental unemployment is detrimental for both.

## Conclusion and discussion

In this article, we have studied the heterogeneous effects of parental unemployment according to children's age and parental level of education on children's enrollment in tertiary education. The results show that parental unemployment has a negative effect on children's higher tertiary achievement. The most detrimental effects can be observed in adolescence, when children are ages 14–15 and 18 and making decisive educational choices.

We do not find any evidence that parental unemployment is detrimental among the children of compulsory-educated parents. A negative effect can only be found among the children of the secondary- and tertiary-educated parents. Nor we do find that long-term family income, parental divorce after unemployment or a second unemployment spell mediates these negative effects. Our analyses indicate that the most plausible explanatory mechanism behind the negative effect of parental unemployment is (relative) status deprivation and the risk aversion that it induces. Additionally, some of the previous studies have reached similar conclusions (Andersen 2013; Brand and Thomas 2014). We do not find any support for the importance of reduced economic resources, cumulative disadvantages or compensation.

Our method and dataset—sibling fixed-effect models and register data—can be considered to yield very reliable results compared to studies applying survey data and the estimation methods not accounting for unobserved heterogeneity. However, our study also has limitations.

First, in the sibling models, we analyze only families with at least two siblings, and the families with one child are excluded from the analysis. Our robustness analyses comparing a one-child family sample to multiple-child families nonetheless suggest that this does not bias the results. However, one must bear in mind that the robustness analyses are only approximate.

Second, it has been pointed out that sibling fixed-effect models can lead to biased estimates if confounders are not completely shared among siblings (for example, see Frisell et al. 2012). We have taken account of some of these confounders by controlling for sibling order and child sex and birth year, factors that vary between siblings. There are certainly more child-level factors that we cannot fully control for with our dataset, such as siblings' school grades, which further research should take into account.

Third, it can be argued that children's health or other factors may lead to parental unemployment, not the other way around, and this reverse causality impacts children's educational achievement. Although we cannot fully control reverse causality, we argue that in our large register dataset this is hardly the case.

Finally, the effect of parental unemployment experience during early childhood (when children are younger than 7) must be interpreted with caution. We only have yearly data from 1987 onward, and there is a 5-year gap between 1980-1985 and a 1-year gap between 1985-1987.

In this study, our focus was not studying short-term effects or psycho-social phenomena, such as stress or social stigma, following from parental unemployment. Furthermore, we are not able to determine whether parental unemployment affects children's school success or motivation. However, we are confident in stating that, at

least in Finland, although education is free of charge and social security is generous, parental unemployment is detrimental for children's tertiary education enrollment. The fact that these effects do not seem to be related to shared family-level cultural factors or long-term reduction in family income makes it even more difficult to combat this type of intergenerational inequality.

## Acknowledgment

This research was supported by the European Research Council (ERC-2013-CoG-617965, P.I. Jani Erola).

## References

- Andersen, S. H. (2013). Common Genes or Exogenous Shock? Disentangling the Causal Effect of Paternal Unemployment on Children's Schooling Efforts. *European Sociological Review*, **29**, 477–88.
- Becker, G. S. and Tomes, N. (1986). Human Capital and the Rise and Fall of Families. *Journal of Labor Economics*. **4**, S1–39.
- Bernardi, F. (2012). Unequal transitions: selection bias and the compensatory effect of social background in educational careers. *Research in Social Stratification and Mobility*, **30**, 159–174.
- Bernardi, F. and Grätz, M. (2015). Making up for an unlucky month of birth in school: causal evidence on the compensatory advantage of family background in England. *Sociological Science*, **2**, 235–251.

- Bernardi, F. and Boado, H-C. (2014). Previous School Results and Social Background: Compensation and Imperfect Information in Educational Transitions. *European Sociological Review* **30**, 207–17.
- Björklund, A. *et al.* (2002). Brother Correlations in Earnings in Denmark, Finland, Norway and Sweden Compared to the United States. *Journal of Population Economic*, **15**, 757–72.
- Brand, J. E. (2015). The Far-Reaching Impact of Job Loss and Unemployment. *Annual Review of Sociology*, **41**, 359–75.
- Brand, J. E. and Thomas, J. S. (2014). Job Displacement among Single Mothers: Effects on Children’s Outcomes in Young Adulthood. *American Journal of Sociology* **119**, 955–1001.
- Bratberg, E., Nilsen, Ø. A., and Vaage, K. (2008). “Job Losses and Child Outcomes.” *Labour Economics* **15**, 591–603.
- Breen, R. and Goldthorpe, J. (1997). Explaining Educational Differentials Towards a Formal Rational Action Theory. *Rationality and Society* **9**, 275–305.
- Breen, R. and Yaish, M. (2006). Testing the Breen-Goldthorpe model of educational decision making. In Morgan, S. L., Grusky, D. B. and Fields, G. S. (Ed.), *Mobility and inequality*. Stanford California: Stanford University Press, pp. 232–258.
- Brooks-Gunn, J. and Duncan, G. J. (1997). The Effects of Poverty on Children. *The Future of Children*, **7**, 55–71.

- Clark, A., Georgellis, Y. and Sanfey, P. (2001). Scarring: The Psychological Impact of Past Unemployment, *Economica* **68**, 221–41.
- Coelli, M. B. (2011). Parental Job Loss and the Education Enrollment of Youth. *Labour Economics* **18**, 25–35.
- DiPrete, T. A. and Eirich, G. M (2006). Cumulative Advantage as a Mechanism for Inequality: A Review of Theoretical and Empirical Developments. *Annual Review of Sociolog*, **32**, 271–97.
- Duncan, G. J. and Brooks-Gunn, J. (2000). Family Poverty, Welfare Reform, and Child Development. *Child Development* **71**, 188–96.
- Duncan, G. J. *et al.* (1998). How Much Does Childhood Poverty Affect the Life Chances of Children? *American Sociological Review*, **63**, 406–23.
- Ekhaugen, T. (2007). Extracting the Causal Component from the Intergenerational Correlation in Unemployment. *Journal of Population Economics*, **22**, 97–113.
- Erikson, R. and Jonsson, J. O. (Eds.). (1996). *Can education be equalized? The Swedish case in comparative perspective*. Boulder CO: Westview Press.
- Erola, J. (2009). “Social Mobility and Education of Finnish Cohorts Born 1936—75. Succeeding While Failing in Equality of Opportunity?” *Acta Sociologica* **52**(4):307–27.
- Erola, J. and Jalovaara, M. (2016). The Replaceable: The Inheritance of Paternal and Maternal Socioeconomic Statuses in Non-Standard Families, *Social Forces*. Online first.



- Erola, J., Jalonen, S. and Lehti, H. (2016). Parental education, class and income over early life course and children's achievement. *Research in Social Stratification and Mobility*, **44**, 33–43.
- Frisell, T. *et al.* (2012). Sibling Comparison Designs: Bias From Non-Shared Confounders and Measurement Error, *Epidemiology*, **23**, 713–20.
- Galambos, N. L. and Silbereisen, R. K. (1987). Income Change, Parental Life Outlook, and Adolescent Expectations for Job Success, *Journal of Marriage and Family*, **49**, 141–49.
- Gangl, M. (2006). Scar Effects of Unemployment: An Assessment of Institutional Complementarities. *American Sociological Review*, **71**, 986–1013.
- Grätz, M. (2015). When Growing Up Without a Parent Does Not Hurt: Parental Separation and the Compensatory Effect of Social Origin. *European Sociological Review*, **31**, 546–57.
- Hansen, H-T. 2005. Unemployment and Marital Dissolution. *European Sociological Review*, **21**, 135–48.
- Haushofer, J. and Fehr, E. (2014). On the Psychology of Poverty. *Science*, **344**, 862–867.
- Heckman, J. (2006). Skill Formation and the Economics of Investing in Disadvantaged Children. *Science*, **312**, 1900–1902.
- Härkönen, J. (2014). Birth Order Effects on Educational Attainment and Educational Transitions in West Germany. *European Sociological Review*, **30**, 166–79.

- Jahoda, M. (1982). *Employment and unemployment: A social-psychological analysis*. Cambridge: Cambridge University Press.
- Jencks, C. and Tach, L. (2006). Would Equal Opportunity Mean More Mobility? In Morgan, S. L., Grusky, D. B. and Fields, G. S. (Ed.), *Mobility and inequality*. Stanford California: Stanford University Press, pp. 23–58.
- Jääntti, M. *et al* (2006). American Exceptionalism in a New Light: A Comparison of Intergenerational Earnings Mobility in the Nordic Countries, the United Kingdom and the United States. *IZA Discussion Paper* No. 1938.
- Kahneman, D. and Tversky, A. (1979). Prospect theory: An analysis of decision under risk. *Econometrica: Journal of the econometric society*, **47**, 263–291.
- Kalil, A. and Ziol-Guest, K. M. (2008). Parental Employment Circumstances and Children’s Academic Progress. *Social Science Research*, **37**, 500–515.
- Karhula, A., Lehti, H. and Erola, J. (2015). Intergenerational Scars? Long-term Effect of Parental Unemployment during Depression on Socioeconomic Achievement. *Working Papers on Social and Economic Issues* 7/2015.
- Levine, P. B. (2011). How does parental unemployment affect children’s educational performance? In Duncan, G. J. and Murnane, R. J. (Ed.), *Whither opportunity? Rising inequality, schools, and children’s life chances*, New York: Russell Sage Foundation, pp. 315–358.
- Nilsen, Ø. A. and Reiso, K. (2011). Scarring effects of unemployment. *NHH Dept. of Economics Discussion Paper* 26.

- Oreopoulos, P., Page, M. and Stevens, A. H. (2008). The Intergenerational Effects of Worker Displacement. *Labour Economics*, **26**, 455–83.
- Prix, I. and Erola, J. (2016). Does Death Really Make Us Equal? Educational Attainment and Resource Compensation after Paternal Death in Finland. *Social Science Research*. Online First.
- Powdthavee, N., and Vernoit, J. (2013). Parental Unemployment and Children's Happiness: A Longitudinal Study of Young People's Well-Being in Unemployed Households. *Labour Economics*, **24**, 253–63.
- Rege, M., Kjetil T., and Votruba, M. (2011). Parental Job Loss and Children's School Performance. *Review of Economic Studies*, **78**, 1462–89.
- Sigle-Rushton, W. *et al.* (2014). Proceed with caution? Parents' union dissolution and children's educational achievement. *Journal of Marriage and Family*, **76**, 161–174.
- Stevens, A. H. and Schaller, J. (2011). Short-run effects of parental job loss on children's academic achievement. *Economics of Education Review*, **30**, 289–299.
- Ström, S. (2003). Unemployment and families: A review of research. *Social Service Review*, **77**, 399–430.

## Appendix

**Table 1. Sibling fixed-effect models for children exposed only to paternal or maternal unemployment.**

|                              | Father  | Mother   |
|------------------------------|---------|----------|
| Unemployment                 | -0,100* | -0,0725* |
|                              | 0,051   | 0,036    |
| Sibling fixed effect         | YES     | YES      |
| Basic controls + fam. income | YES     | YES      |
| <i>N</i>                     | 5484    | 8875     |

Standard errors in italics \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

**Table 2. Chi<sup>2</sup> test of parental unemployment and children's educational achievement.**

| Age exposed to parental unemployment | <i>Chi<sup>2</sup></i> | <i>p-value</i> |
|--------------------------------------|------------------------|----------------|
| 0-4                                  | 1,313                  | 0,252          |
| 5-6                                  | 2,465                  | 0,116          |
| 7                                    | 7,539                  | 0,00604        |
| 8                                    | 4,602                  | 0,0319         |
| 9                                    | 8,657                  | 0,00326        |
| 10                                   | 8,893                  | 0,00286        |
| 11                                   | 8,447                  | 0,00366        |
| 12                                   | 9,268                  | 0,00233        |
| 13                                   | 7,341                  | 0,00674        |
| 14                                   | 18,62                  | <0.001         |
| 15                                   | 22,6                   | <0.001         |
| 16                                   | 9,419                  | 0,00215        |
| 17                                   | 5,016                  | 0,0251         |
| 18                                   | 24,58                  | <0.001         |