



The heterogeneous effects of parental unemployment on siblings' educational outcomes

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ARTICLE INFO

Keywords:

Parental unemployment
Education
Register data
Sibling fixed effects
Relative risk aversion

ABSTRACT

The literature on the intergenerational effects of unemployment has shown that unemployment has short-term negative effects on children's schooling ambitions, performance and high school dropout rates. The long-term effects on children's educational outcomes, however, are mixed. One potentially important limitation of previous studies has been that they have ignored the heterogeneous effects of parental unemployment on children's education. We study the effects of parental unemployment on children's grade point average, enrollment into general secondary and tertiary education by comparing the effects according to the children's age of exposure and the parental level of education. We use high quality Finnish longitudinal register data and sibling fixed-effect models to obtain causal effects. We find that parental unemployment has negative effects on both children's educational enrollment and performance at the educational transitional periods when children are an adolescent but parental unemployment is not detrimental in early childhood. For general secondary but not for tertiary enrollment, children's poorer school performance due to parental unemployment explains the effect entirely. Parental unemployment is not affecting children general secondary enrollment or school performance among higher educated parents. However, children with a higher educated parent exposed to unemployment are less likely to enroll in tertiary education. The reduced amount of parental economic resources due to unemployment cannot explain any of these effects. This calls for other forms of support for children at crucial periods when educational decisions are made.

1. Introduction

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 the effects on children's life-course and socioeconomic as well as educational attainment are somewhat mixed. Some studies find that parental unemployment has a negative effect on children's income, education and social status (e.g., Brand & Thomas, 2014; Coelli, 2011; Karhula, Lehti, & Erola, 2017; Oreopoulos, Page, & Stevens, 2008; Rege, Kjetil, & Votruba, 2011); others have failed to show any effect at all (e.g., Bratberg, Nilsen, & Vaage, 2008; Ekhaugen, 2009).

One possible explanation for the mixed evidence is that the previous studies have not considered the potentially heterogeneous effects of parental unemployment on children's outcomes. We investigate how the effect of parental unemployment on children's educational

outcomes varies according to age exposed to unemployment and parental levels of education, two factors that are not taken into account by the previous studies. Because non-twin siblings are always exposed to a specific parental unemployment episode at different ages, we are able to exhaust this within-family variation in sibling fixed-effects models to efficiently reduce unobserved family-level heterogeneity. This approach provides estimates for the causal effect of parental unemployment on children's educational outcomes, obtaining a level of accuracy that previous studies on the topic have not been able to achieve. The comparison of fixed-effects results to the random-effects models provides us with important information on the role of family background selection.

Our approach allows us to compare the importance of the different mechanisms behind the intergenerational effects of parental unemployment on education. Because cognitive and emotional skills develop in early childhood, previous studies suggest that a family's economic resources in early childhood determine later educational and socioeconomic outcomes (Duncan & Brooks-Gunn, 2000; Duncan,

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Ziol-Guest, & Kalil, 2010; Hanson et al., 2013). However, educational choices are made during adolescence, and thus, parental unemployment in later youth may have an impact on children's future prospects and educational choices (cf. Erikson & Jonsson, 1996). Moreover, older children are more sensitive to the effects of social psychological factors, such as a family's status decline (Andersen, 2013; Brand & Thomas, 2014), and they may perceive more risks in continuing to pursue higher education when experiencing parental unemployment.

Furthermore, parents differ in their ability to compensate for the disadvantages that may arise due to 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 capital and, to some extent, social capital, are likely to remain (cf. Bernardi, 2012; Prix & Erola, 2017; Ström, 2003). It has also been argued that the negative effects are not directly related to unemployment as such but rather to the economic consequences for families (Galambos & Silbereisen, 1987; Jahoda, 1982; Oreopoulos et al., 2008; Rege et al., 2011; 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 & Thomas, 2014; Andersen, 2013; Powdthavee & Vernoit, 2013).

In this study, we focus on how parental unemployment affects three educational outcomes. Grade point average (GPA) at the end of compulsory schooling (age 15), entry into general secondary education (academic track, after compulsory schooling), and entry into tertiary education (by age 21, after general secondary education). We distinguish the effects according to children's age at the first occurrence of parental unemployment and the 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 individual-level factors.

2. Mechanisms behind the negative effects of unemployment

2.1. Family income

One of the most obvious results of parental unemployment is the reduction of a family's available economic resources. The negative income effects are not restricted to the period when a person remains unemployed. For instance, Gangl (2006) found 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 negative intergenerational effects are at least partially related to a family's reduced economic resources. Using longitudinal data from Canada, Coelli (2011) found that parental job loss at high school age (16–17) reduced children's postsecondary education enrollment. He attributed this result to the income loss of 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 & Tach, 2006). Similarly, Kalil and Ziol-Guest (2008), using US survey data, found an association between a father's job loss and children's grade repetition and school suspension.

In the literature, the effects of economic resources on education are usually explained by parents' potential to invest such resources in their children and the material endowments available for the children to use for their own good (e.g., Becker & Tomes, 1986). It has been argued that the rates of return on investments in disadvantaged children's human capital have a declining curve based on the children's age. Investments during early childhood produce greater returns than those that occur later in life (Heckman, 2006). Some studies have even suggested that reduced parental income can have a negative causal effect

on children's cognitive achievement. These effects are even greater for children growing up in more disadvantaged families and are more relevant if they are experienced during early childhood (Brooks-Gunn & Duncan, 1997; Duncan, Yeung, Brooks-Gunn, & Smith, 1998). Therefore, we hypothesize the following:

Hypothesis 1 (H1). If the negative effect of parental unemployment on children's educational achievement is due to parental economic resources, then the effect is stronger during early childhood than during later childhood and is greatly reduced when adjustments are made for differences in parental income.

2.2. Cumulative disadvantages

According to the so-called Matthew effect, 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 (Merton, 1968). This means that disadvantageous events such as unemployment, to which children and families are exposed, may lead to other disadvantages such as a reduction of income in the long term and parents' weakened prospects in the labor market (DiPrete & Eirich, 2006; Gangl, 2006; Oreopoulos et al., 2008).

Indeed, recent studies have noted that unemployment also produces life-course disadvantages in other domains and in the life courses of other individuals. This *scarring effect of unemployment* has been shown to negatively affect long-term labor market attachment (Gangl, 2004; Nilsen & Reiso, 2011), reduce long-term income (Gangl, 2006), increase family dissolution (Hansen, 2005) and create health problems (Clark, Georgellis, & Sanfey, 2001). Although the scarring effect has been associated with individuals experiencing their own unemployment, it may also have an effect at the family level. For example, parental unemployment has been shown to distract children's schooling performance and motivation (e.g., Andersen, 2013), which has a tendency to accumulate over time and finally affect children's educational attainment and even further socioeconomic outcomes (Blau & Duncan, 1967; Mincer, 1974).

In our case, the accumulation of the disadvantages occurs as a function of the age at which parental unemployment was first experienced such that earlier experiences will lead to more negative outcomes. This comes close to the effect we expect to observe if a lack of economic resources was the cause of the negative effects. However, in this case, controlling for the family income during childhood and youth should not cancel the negative effects. Therefore, we suggest the following hypothesis:

Hypothesis 2 (H2). The earlier parental unemployment is experienced, the stronger its negative effect will be, independent of family income during childhood and youth.

If accumulation is relevant, the length of parental unemployment should have a similar increasingly negative effect.

2.3. Expectations and relative risk aversion

Not only economic resources, as suggested by Hypothesis 1 but also parental social status can moderate the effect of unemployment on children. The Breen and Goldthorpe (1997) model of education choices suggests that families from different social backgrounds face different constraints and opportunities in terms of costs and benefits and in terms of the probability of successful educational outcomes occurring when selecting among different educational options. Educational decisions made in certain transitional periods of the life course can be highly consequential in ways that children cannot easily reverse later on. 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. These assumptions are backed by empirical evidence (see, e.g., Barone, Triventi, & Assirelli, 2018; Barone, Assirelli, Abbiati, Argentin, & De Luca, 2018; Breen & Yaish, 2006; Breen, van de Werfhorst, & Jäger, 2014; Holm & Jäger, 2008). The results testing RRA are also consistent with behavioral economists' prospect models showing that individuals have a tendency to prioritize avoiding losses over acquiring gains when (educational) decisions involve risks (Kahneman & Tversky, 1979).

The previous studies show that parents' relative status deprivation caused by unemployment has a negative impact on children's educational ambitions and prospects (Andersen, 2013). As a consequence of parental unemployment, children may lower their expectations about the value of education, and they may exit education earlier on (Brand, 2015). This means that parental unemployment may lead to stronger time discounting preferences; thus, families and children prefer immediate returns over future returns. Breen et al. (2014) found that higher levels of risk aversion and time discounting preferences are associated with a higher probability of entering vocational rather than academic secondary school. Signals of increased uncertainty at the family level may particularly apply to choices made regarding secondary and tertiary education. Thus, parental unemployment can function as an (negative) information channel to families and children on the benefits of education when determining whether to continue education or enter labor markets.

We assume that the uncertainty that parental unemployment produces modifies children's perceived time discounting preferences in their education decisions, making them more likely to value the short-term benefits of the educational track choice. By opting for a more rapid transition to the labor market, families and children may feel that they are reducing uncertainty and avoiding further losses, strengthening the time discounting preferences of the children of the unemployed (i.e., when making educational decisions, individuals prefer immediate returns over more distant future returns even when future returns are higher).

The theory of RRA assumes that the children of less-educated parents view continuing to a higher educational level as a risky option independent of the presence of parental unemployment (see, e.g., Barone, Triventi et al., 2018; Barone, Assirelli et al., 2018; Breen & Yaish, 2006; Holm & Jäger, 2008). In contrast, the children of better-educated parents perceive continuing higher educational level as less risky and may be more likely to change their views particularly regarding higher education when exposed to parental unemployment. Thus, when one determines whether to enroll in higher education, time discounting preferences can be expected to change only slightly for children with less-educated parents but more so for the children of better-educated parents. If these assumptions hold, parental unemployment provides negative information on the benefits of continuing education for children and becomes visible particularly among better-educated families in the years in which education choices are made.

Because RRA is based on secondary effects and is thus related to family status (and decline of it), school performance (i.e. primary effects) cannot explain the association between parental unemployment and educational choices (Boudon, 1974). Thus in our case, the negative effects should show in educational choices rather than in school performance. Further, because education decisions are made in the final years of compulsory and secondary school, parental unemployment is effective particularly just before the transitional periods. We suggest the following two hypotheses based on RRA and time discounting preferences:

Hypothesis 3a (H3a). The negative effect of parental unemployment on children's higher education becomes stronger as the parental level of education increases.

Hypothesis 3b (H3b). The effect of parental unemployment is more detrimental if it is experienced just before educational transition periods.

2.4. Compensatory advantages

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 the causal effect of parental unemployment on adult children's employment status (Ekhaugen, 2009). A potential reason for the deviating results is the institutional context. In the Nordic countries—such as Finland in this study—higher education is free of charge, reducing the importance of family economic resources in socioeconomic attainment (Erola, Jalonen, & Lehti, 2016) and thus the negative effect of parental unemployment (Lindemann & Gangl, 2018). 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, specifically, the compensation of parental human capital. In addition to the existence of a strong welfare state, parents themselves may be able to compensate for economic loss with other resources they still have available. Compensatory advantages have been previously reported in cases of children's lower academic achievement (Bernardi, 2012; Bernardi & Boado, 2014), divorce (Bernardi & Grätz, 2015; Erola & Jalovaara, 2017) and parental death (Prix & Erola, 2017).

Similar to the RRA hypothesis, the association between parental unemployment and educational decision-making should be heterogeneous based on family background. However, in the case of compensation, the effects that follow from parental unemployment are likely to occur differently, thus forming a competing hypothesis for RRA (see above H3). Higher educated parents may feel less stress due to unemployment because their labor market prospects may be more favorable than those of parents with lower education. Further, the primary effects (Boudon, 1974) that are related to children's educational performance may be compensated by higher parental human capital. While unemployment may reduce parental income and lower social status, it does not negatively influence such individuals' level of education. This suggests the following hypothesis:

Hypothesis 4 (H4). Higher parental education protects children from the negative effects of parental unemployment (compensation hypothesis).

We assume that this protecting effect to be independent of the age at which parental unemployment is experienced.

Some of the earlier studies appear to provide empirical support for this type of mechanism, suggesting that the negative effects of parental unemployment on children's attainment are concentrated among disadvantaged families (Oreopoulos et al., 2008; Levine, 2011; Stevens & Schaller, 2011). In contrast, the findings of Brand and Thomas (2014) studying single-parent families suggest that the negative effects of parental unemployment on children's educational achievement are greater among children of advantaged families if the level of unemployment in a society is otherwise low.

3. 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, Eriksson, Jäntti, Raaum, & Österbacka, 2002; ; Erola, 2009; Grätz et al., 2019). 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 (e.g., see Lindemann & Gangl, 2018).

In Finland, the state together with unemployment funds provides social security for the unemployed. When the duration of employment before the start of unemployment lasted at least ten months, the employee is entitled to an earnings-related unemployment allowance for 500 days of continuous unemployment. The state pays roughly 95 percent of unemployment benefits and the rest is covered by unemployment funds. This benefit is typically valued at approximately 70 % of the recipient's pay prior to the start of unemployment. However, when an individual is not a member of the unemployment fund, he or she cannot receive the earnings-related unemployment benefit, and the state then pays somewhat lower unemployment benefits, which are not dependent on prior earnings. After 500 days, the benefits decrease to approximately one-third of the individual's average pay. This amount is assumed to meet the minimum economic needs of an average family.

Because main unemployment benefits are earnings-related and depend on fund membership, the funds cover as many as 90 percent of all employees. To receive unemployment benefits a person must be officially registered as an unemployed jobseeker. Unemployment offices can offer a job to the registered unemployed; however, until 2018 the rejection of offered jobs was not sanctioned. The labor law implemented in 1987 obligated municipalities and the state to organize full-time work for at least 6 months of the year to those who have been unemployed for one year or more. However, during the recession of the early 1990s, the costs of this law grew too high. Subsequently, the employment obligation was removed and this has remained the case ever since. Thus, the state and municipalities only provide limited support for re-employment in the form of unemployment offices assisting with the job seeking process and organizing courses related to job searches for the unemployed.

In Finland, the educational system is provided free of charge at all levels, including tertiary education, and studies are subsidized by student grants and subsidized student loans. Fig. 1 provides an illustration of 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 apply for an academic (general upper secondary) or vocational track, each lasting approximately 3 years. Entry into the academic track is almost solely based on one's GPA for the final year of comprehensive school. It is also possible to drop out after completing compulsory education and not to continue with secondary education; however, only a small number of individuals choose to do so. In our dataset of cohorts for the period of 1986–1993, approximately 51 % attended general secondary school at age 16, approximately 36 % attended vocational secondary school and approximately 13 % did not continue to secondary-level schooling at 16 years of age.

After general secondary education, students often continue on to study at universities (mostly master's level courses) or polytechnic schools (mostly bachelor's level courses). Fig. 1 shows that 34 % of the general secondary educated continued to universities and 39 % continued to polytechnics. Thus, 27 % did not continue to tertiary-level studies from the general secondary level before they were 21 years old. From vocational secondary education, approximately 13 % continued to polytechnics and less than 1 % continued to universities. From vocational education, approximately 86 % did not continue to study at the tertiary level. For a more detailed account of early socioeconomic trajectories in Finland, see Karhula, Erola, Raab, and Fasang (2019).

In the sample of cohorts born from 1986 to 1993, 17 % attended universities and 24 % attended polytechnics before they were 22 years old. In Finland, entry into universities and polytechnics is mostly based on entrance exams and in part on the matriculation exam of the general secondary education.

4. Data and methods

4.1. Register data

In the analyses, we use a register-based *Finnish Growth Environment* dataset. The dataset is based on a 10 % sample of the Finnish

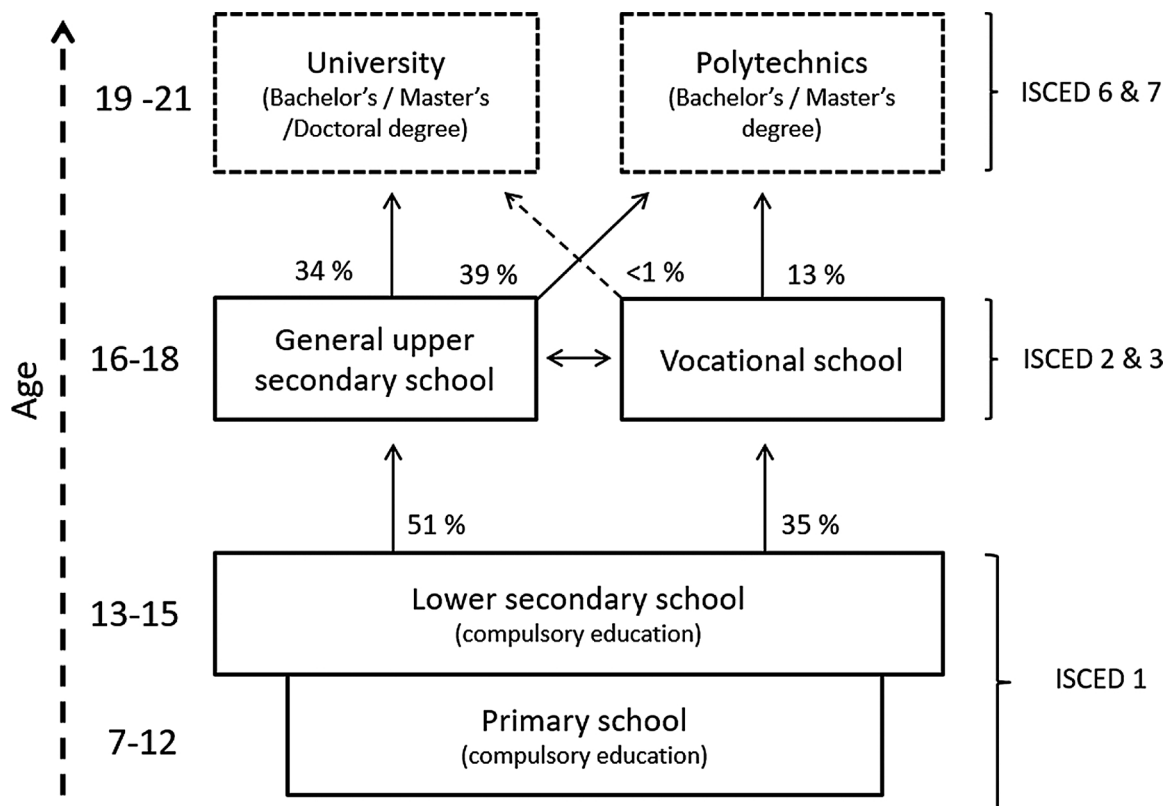


Fig. 1. Summary of the Finnish education system. Source: Ministry of Education and Culture 2015 and own calculations based on a sample of cohorts born 1986-1993. Note: ISCED 2011 classification.

population of 1980 that is matched with all the children born between 1986 and 1997. The dataset contains annual information on all applied variables from 1987 onwards so that we can observe parental unemployment yearly for every child. All persons are followed until 2014 or when they dropped out of the data because of either death or moving abroad. The analyses are restricted to biological siblings who lived in the same household with at least one biological parent (18.8 % of the children did not meet this condition). The children who started compulsory school one year before official age 7 (0.7 % of all children) and thus finished school one year before at the age of 14 are omitted from the analyses. The final *full sample* that is applied in the random-effect models and therefore includes one-child families covers 113,100 in 79,151 families.

Our *fixed-effects sample*, which is used in the sibling fixed-effects models, is constructed in the following manner. First, we excluded singletons ($N = 52,525$) and twins in two-sibling families who lacked within family variation ($N = 2108$). Then, we omitted families in which children were not exposed to parental unemployment ($N = 39,687$), and we ultimately selected families in which the oldest sibling did not experience unemployment before his or her schooling was completed (a requirement for the control group), therefore excluding 16,272 cases. Thus, our final analytical sample for the fixed-effects models includes 2508 individuals in 951 families.

However, to study enrollment in tertiary education, we must be able to observe children who are older (at age 21) than for the two other outcomes (at age 15). Because of this, the data for these analyses are further restricted to the cohorts born between 1986 and 1993. In these analyses, the full sample includes 73,715 children in 53,821 families, and the fixed-effect sample includes 1855 children in 645 families.

4.2. Dependent and independent variables

We measure children's educational achievement with the three different dependent variables:

- 1 Academic grade point average (GPA), based on the grades at the end of compulsory school, the year when children turn 15 ($M = 7.68$, $SD = 1.05$, $Min = 4$, $Max = 10$); the GPA is z-standardized for the analyses ($M = 0$, $SD = 1$).
- 2 Enrollment in general secondary school (ISCED 3) dummy variable at age 16 ($M = 0.51$).
- 3 Tertiary (ISCED-levels 6 and 7) educational enrollment dummy variable at ages 19–21 ($M = 0.29$).

These three different measurements give us the possibility of evaluating how parental unemployment affects children's schooling and thus distinguishes between the different mechanisms mentioned in the theory section. For example, grade point averages include grades for academic subjects that are evaluated when applied to the general secondary school. Thus, the negative effect of parental unemployment on GPA indicates decreasing learning ambition, distraction, and cumulative effects, as predicted by our H2, which should be more evident in GPA than in more short-term choice-related outcomes, as indicated in the previous literature (Andersen, 2013). However, RRA should be limited to the entry into general secondary and higher education as predicted by H3a and H3b. RRA should be effective, especially before the transitional periods while controlling the grade point average (educational performance) and, in the case of tertiary education, secondary school track choice (vocational or general secondary). This is because school performance can be a mediating factor behind the association between education decisions and parental unemployment.

Because the Finnish educational system is free of charge, we do not make assumptions about whether the impact of H1 on the economic effects of parental unemployment applies differently across the outcomes.

Our main explanatory variable is *age exposed to parental unemployment for the first time*. The previous research has shown that the negative

effects of parental unemployment on children's school outcomes depend on the age when children experience it (Brand & Thomas, 2014). Furthermore, other disadvantageous life-course events, such as divorce (Grätz, 2015; Sigle-Rushton, Lyngstad, Andersen, & Kravdal, 2014) and poverty (Duncan & Brooks-Gunn, 2000), have also been shown to be dependent on a child's age. Because all the siblings with a different year of birth experience parental unemployment at different ages (but in the same historical year), we can use this information in a sibling fixed-effect setup to identify the effect of parental unemployment on educational outcomes. With our explanatory variable, we can study whether parental unemployment is disadvantageous for children's education, and further, whether the negative effect is dependent on the child's age when parental unemployment is experienced.

Parental unemployment is defined as either mothers' or fathers' unemployment. The auxiliary analyses (see Appendix Tables A.1a and A.1b in Supplementary material) show that there are no statistically significant differences in these effects in the Finnish context, although paternal unemployment seems to have stronger age-specific effects than maternal unemployment.¹ We also provide histograms for the months of unemployment, as reported by mothers and fathers, in Appendix Fig. A.1 in Supplementary material. The histograms show very similar distributions.

The information on unemployment is based on the number of months a parent has been registered as unemployed in employment offices within a single year. A parent is defined as unemployed if unemployment continues for more than one month during a year. Some of the previous studies have applied a less strict limit of 4–5 months (see Eghaugen, 2009) to exclude parents with short transitory periods of unemployment. In our case, the results do not change substantively if similar limit is applied in our analyses, although many fewer parents fall into the group of unemployed, which also subsequently broadens the confidence intervals (see results Appendix Table A.2a compared to Table A.5 in Supplementary material).

Due to the unemployment benefits received if registered, the underreporting of unemployment is rare. However, we are not able to observe whether unemployment is voluntary or involuntary, and this should be noted when interpreting the results. If our sample contained parents, who are voluntarily unemployed, this would lead to an underestimation of the results; however, this is hardly the case. A study that examined voluntarily based unemployment in Finland concluded that only 1 % can be considered to be voluntarily unemployed of all the unemployed (Martikainen, 2003). This share is likely to be even lower among the unemployed parents studied here. Because unemployment may have detrimental effects on health, we exclude the parents who were unemployed due to a disability.

In random intercept models, we can differentiate the effects based on each age of experiencing parental unemployment for the first time, starting from age 1. However, in the sibling fixed-effect models, singletons and children who are not exposed to unemployment must be excluded from the analyses, which limits the number of cases considerably. Consequently, there are only a few cases left in which parental unemployment was experienced during early childhood. Therefore, in the models for *GPA* and *general secondary enrollment*, we combine all those experiencing parental unemployment before age eight into one group.² In addition, because the number of cases was also too low when we modeled ages 8–10 individually, we combine ages 8–10 into same group. The separate effects for each age are differentiated from those experiencing unemployment at ages 11–15 while

¹ The differences of the effects and the point estimates of maternal and paternal unemployment on children's education outcomes are discussed further in the additional analyses.

² Note that the gains in statistical power following from this are not as great as they would be in random intercept models. To observe any effects, siblings must fall under different age categories; however, sample consists only few families in which siblings' ages differ by 9 years or more.

keeping as a reference group siblings who did not experience parental unemployment by age 15 and those who finished their compulsory schooling.

In the models for *tertiary education enrollment*, we limit our analyses to those who continue their education to at least secondary education. Children finish compulsory school at age 15, and those not continuing to secondary education cannot continue to tertiary education. Further, in these models, we differentiate age-specific effects with four dummy indicators, one each for age 15 and younger to age 18. Further, children typically finish their secondary education by age 19, and it is relatively usual to have left the parental home for good by that age (35 % according to official statistics). Eghaugen (2009) used a similar upper-age cut-off point previously.

In the sibling fixed-effect models, we are unable to control the parental educational level because it is a constant among siblings. To compare the results by the level of parental education, we must run separate sets of models according to them. To do so, we distinguish two levels of parental education: (I) Compulsory or vocational degree, (II) Academic track degree (general secondary degree or higher).

The information on parental education is acquired from the same or the closest earlier year when one of the parents experienced unemployment. For those children who did not experience parental unemployment, included in our random-effect models only, we take the highest level of education of either parent by age 19.³ We distinguished only two levels of parental education to gain maximum statistical power for the sibling fixed-effect models.⁴ Table 1 (see 4.5 Descriptive statistics) shows the descriptive statistics of parental education separated into six categories, which are used as the control variables in the random-effect models.

4.3. 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, year of birth, siblings' birth order and duration of parental unemployment* in months. All of these factors vary between siblings and have been shown to affect educational achievement (e.g., Andersen, 2013; Brand & Thomas, 2014; Ekhaugen, 2009; Härkönen, 2014; Sigle-Rushton et al., 2014). The auxiliary analyses (see Appendix Table A.2b in Supplementary material) show that the duration of parental unemployment is not statistically significant for the outcomes. However, the duration of unemployment can play a role, albeit relatively modest, in the sibling fixed-effect models where we investigate age exposed to parental unemployment; consequently, we decided to control for it. Additionally, in random intercept models, we control for maternal and paternal education including six categories (see descriptive statistics) and family type (intact or non-intact family) during parental unemployment that is constant between siblings.

The baseline fixed-effect models—where we control for the child's sex, birth year, siblings' birth order and duration of parental unemployment—are compared to the additional models used to test our hypotheses. In the models for entry into general secondary- and tertiary education, we control for the grade point averages of the academic subjects and provide a dummy indicator if those data are missing (3 %).

³ Because either mothers or fathers can be unemployed, we also tested models with combinations of parental education. We do not find statistically significant differences, as reported in the results section.

⁴ While we also created models adopting different categorizations of parental education, the categorizations used here provide the highest levels of statistical fit and power. For example, when we categorized highly (tertiary) and less educated parents (those with a general secondary education were included in this group) into separate groups, the estimates remained the same, as the statistical power decreased for the highly educated parents while the sibling FE-models assigned less statistical significance to the estimates.

Thus, we can analyze whether school performance mediates the effects of parental unemployment and education enrollment. If a person has not applied to any secondary education program after finalizing compulsory education, the GPA is never centrally registered. Additionally, the GPA is missing for a very small number of children because they never finalized their compulsory schooling (approximately one in 250 by official statistics).

Further, we control for average annual family income. The annual family income is calculated by taking the total gross income of the parents living in the same household with a child, which is then deflated to the price level of the year 2014 and log-transformed. When estimating the models for GPA and secondary education enrollment, the average annual family income is based on the total family income of a child by the age of 15; for tertiary enrollment, it is based on the total family income of a child by the age of 18. We are not able to calculate net family income (income after taxes) for every follow-up year because the tax registers that we use do not contain tax records before the year 1991; thus, in the analyses, we use gross family income (income before taxes).

In the models, where we analyze tertiary enrollment by parental education, we also control for children's secondary school selection (whether they enroll in general or vocational secondary schools) and GPA to study the relative risk-aversion mechanism.

4.4. Methods

One of the 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 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 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, erroneous conclusions about the relationship between parental unemployment and children's educational achievement.

In this study, we use a register-based dataset that contains information about parents and their children within families, thus, we are able to 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 fewer biased estimates than regular (between-individual) regression estimates. By controlling for 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 causal relationship between independent and dependent variables (see, e.g., Sigle-Rushton et al., 2014). A similar approach has previously been used to study the intergenerational effects of unemployment (Ekhaugen, 2009) and divorce (Sigle-Rushton et al., 2014).

The sibling fixed-effect model has been considered a simple extension of the matched case-control design. All the effects that are being estimated are those that differentiate siblings from one another. In our setup, the most important of such factors is the age when each sibling experiences parental unemployment.

Siblings with different year of birth experience parental unemployment periods at different ages but within the same year. We can use this information in a sibling fixed-effect design to identify the effect of parental unemployment on educational outcomes. In the models, the oldest siblings are assigned to our reference (or control) group. They experience parental unemployment only after compulsory or secondary school is finished. Thus, only the later born siblings (treatment group) are exposed to parental unemployment before they finish their schooling.

Sibling fixed-effect models automatically control for any measured or unmeasured factors shared by siblings 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 genetic variance that siblings share (Frisell, Öberg, Kuja-Halkola, & Sjölander, 2012).

In sibling fixed-effect models, children are nested into their families. We use linear probability models to estimate the average marginal effects of general secondary and tertiary enrollment and linear models for the estimates of the grade point averages. We compare the estimates from the sibling fixed-effect models with the results from random intercept models to show how much unobservable heterogeneity contributes to the estimates, because the random intercept model does not control for all family-level factors and thus does not take into account all unobserved heterogeneity. In the sibling fixed-effect models, we use a robust standard errors estimator. Eq. (1) shows how the sibling fixed-effect model is estimated, and Eq. (2) shows how the random intercept model is estimated.

$$Y_{fi} = \beta X_{fi} + \beta Z_{fi} + \alpha_f + e_{fi} \tag{1}$$

$$Y_{fi} = \beta_0 + \beta X_{fi} + \beta Z_{fi} + \beta \theta_f + u_f + e_{fi} \tag{2}$$

Here, *f* refers to a family, and *i* refers to a sibling. The vector βX_{fi} is a set of dummy variables of parental unemployment at a certain age of the sibling, βZ_{fi} refers to the vector of sibling-specific control variables, and $\beta \theta_f$ refers to family-level control variables (only in random-effect models). In the fixed-effect model, α_f is the family-specific intercept, which is constant between siblings controlling all factors that are invariant on the family level. e_{fi} is the within-sibling error term (variation between siblings).

Although sibling fixed-effect models are an efficient method to control for omitted variable bias at the family level, they also have certain limitations. First, the models do not automatically control any confounding factors that vary between siblings but are not included in the model. Second, sibling fixed-effect models can only be estimated among families with at least two children. Thus, one-child families have omitted from the sibling fixed-effect models. 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, siblings’ birth order, family income and grade point averages, some of these problems can be at least partially overcome (see, e.g., Sigle-Rushton et al., 2014).

4.5. Descriptive statistics

The descriptive statistics of the full and fixed-effect samples in Table 1 show that our dependent and independent variables are close to each other in both samples. The only variables that differ significantly are those for the age of exposure to parental unemployment. In the analytical fixed-effect sample, the average age of exposure is higher because the oldest sibling must be either over 15 or 18 (depending on the outcome), and thus the younger siblings are exposed to parental unemployment on average somewhat older.

We test the potential selection bias of the fixed-effect sample by comparing the estimates from a set of OLS regression models run for both samples and for all outcomes. The estimates for independent variables are reported in the Appendix Tables A.3a and A.3b in Supplementary material. The tables also show Wald tests for the differences between fixed-effect and total sample estimates. We find that the results for the two samples differ significantly statistically for only a single estimate of GPA. The estimate for vocationally educated mothers is effectively zero in the fixed-effect sample but positive and statistically significant in the total sample. The comparison indicates that the fixed-effect sample does not suffer from selection bias.

Table 1
Descriptive statistics of applied variables.

VARIABLES	Full sample		FE sample		Within Sd.
	Mean	Sd.	Mean	Sd.	
Tertiary enrollment	0.29	0.46	0.3	0.46	0.33
General secondary enrollment	0.51	0.5	0.51	0.5	0.32
Academic GPA	7.68	1.08	7.72	1.05	0.64
Standardized academic GPA	0	1	0.03	0.97	0.6
GPA missing	0.03	0.17	0.03	0.17	0.10
Female	0.49	0.5	0.48	0.5	0.40
Year born	1991	3.46	1991	3.25	2.41
Birth order	1.97	1.28	2.64	2.08	0.92
Age at parental unemployment (until 15) ^a	2.61	3.49	6.53	6.74	6.52
Age at parental unemployment (until 18) ^a	3.13	4.25	12.45	5.72	4.48
Duration of parental unemployment (1–15)	21.01	32.66	3.92	7.89	6.11
Duration of parental unemployment (1–18)	23.6	36.32	8.75	11.91	7.12
Log of family income	10.85	0.53	10.98	0.48	0.14
Vocational secondary enrollment	0.39	0.49	0.42	0.49	0.33
Parental separation	0.18	0.38	0.19	0.39	NA.
F. Basic education	0.2	0.4	0.16	0.37	NA.
F. Vocational secondary	0.42	0.49	0.4	0.49	NA.
F. General secondary	0.07	0.25	0.04	0.19	NA.
F. Postsecondary	0.13	0.34	0.16	0.37	NA.
F. Tertiary: bachelor’s degree	0.08	0.28	0.12	0.32	NA.
F. Tertiary: master’s degree or higher	0.1	0.31	0.12	0.33	NA.
M. Basic education	0.15	0.36	0.09	0.29	NA.
M. Vocational secondary	0.38	0.48	0.4	0.49	NA.
M. General secondary	0.08	0.27	0.05	0.21	NA.
M. Postsecondary	0.22	0.41	0.26	0.44	NA.
M. Tertiary: bachelor’s degree	0.08	0.27	0.08	0.28	NA.
M. Tertiary: master’s degree or higher	0.1	0.3	0.11	0.31	NA.
N	113100		2508		

NA. = not applicable.

^a Inserted into the models as dummy variables.

5. Results

We begin the results section by showing the average effects of parental unemployment by children’s age on each outcome. We use the full sample to estimate the random-effect results and the fixed-effect sample in the sibling fixed-effect models. Fig. 2 shows the results of the random-effect models and Fig. 3 of the sibling fixed-effect models by children’s age when exposed to parental unemployment, with baseline controls. When the dependent variable is general secondary or tertiary education enrollment, we also control for GPA to check whether the children’s school performance explains educational choices. All the estimates are reported in the Appendix Tables A.4a and A.4b in Supplementary material for RE models and Table A.5 for FE models. In both Figures, 95 % confidence intervals are displayed around the estimates.

For GPA, the random-effects results in Fig. 2 show that parental unemployment is the most disadvantageous to children’s education if it is experienced in early childhood, reducing children’s GPA on average 0.15–0.055 standard deviations at age 1–5, and again just before the end of compulsory schooling at age 14–15 (the average point estimate is between –0.06 and –0.08). In the case of general secondary and tertiary enrollment, the experience of parental unemployment shows a very similar pattern. From ages 1–5, children who experience parental unemployment have, on average, a 2–5 percentage points lower probability of enrolling in general secondary or tertiary education than children who do not experience parental unemployment. Again, at age 14, parental unemployment reduces general secondary enrollment by an average of 4 percentage points and tertiary enrollment by an average of 5 percentage points. Furthermore, exposure to parental

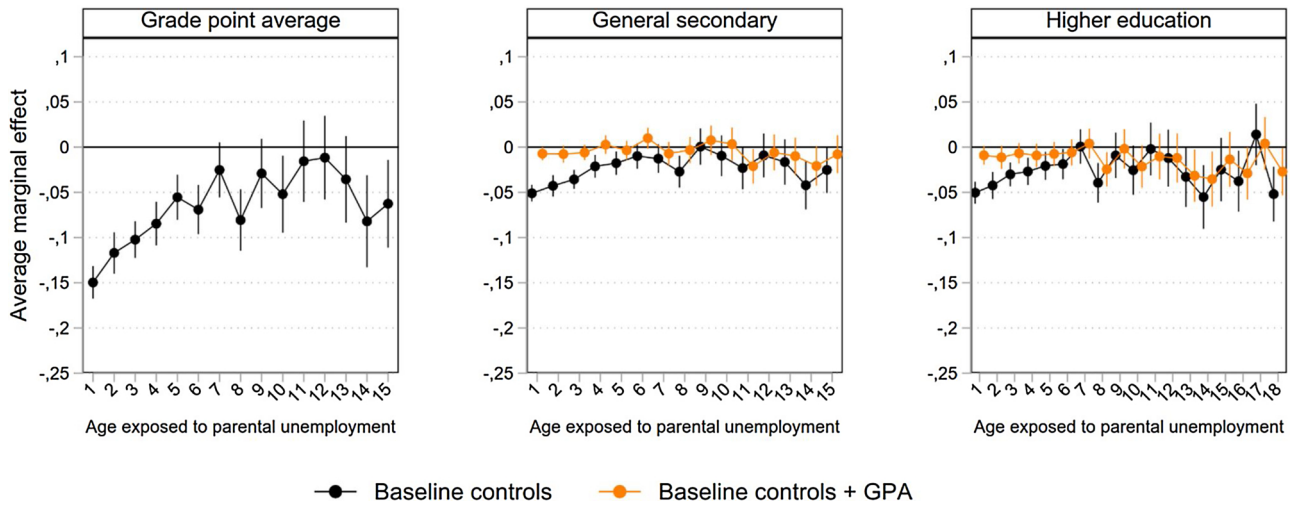


Fig. 2. The estimated effect of parental unemployment on children’s GPA (left panel), general secondary enrollment (middle panel), tertiary enrollment (right panel) using random intercept models and average marginal effects. Note: Baseline models (black symbols) control for year of birth, birth order, child’s sex, duration of parental unemployment, maternal and paternal education and family type. Orange symbols control for baseline model’s variables and GPA. 95 % confidence intervals around the estimates.

unemployment at age 18 decreases the probability of enrollment in tertiary education by 5 percentage points. In general, children who experience parental unemployment have a 2–5 percentage points lower probability of enrolling in general secondary or tertiary education.

The associations should be considered to be relatively weak for all three outcomes. The results are also in line with the previous research, also showing that parental unemployment reduces by approximately 5 percentage points postsecondary enrollment in Finland, and among European countries, the effect is one of the smallest (see Lindemann & Gangl, 2018). Finally, when we control for GPA in the models the negative association of parental unemployment with general secondary education, entry becomes negligible, and the effects on tertiary enrollment become very small (3.5 percentage points or less).

Overall, the random-effect models indicate that parental unemployment experienced in early childhood is disadvantageous, particularly for children’s GPA, indicating the importance of Hypothesis 2 with regard to cumulative effects. Further, parental unemployment is disadvantageous at an age when educational choices are still made after controlling the GPA for tertiary enrollment, indicating a higher risk of

continuing in tertiary education among children who are exposed to unemployment, thus supporting Hypotheses 3a and 3b. However, because the random-effect models do not entirely control for the unobserved heterogeneity at the family level, we must compare the results to the sibling fixed-effect models.

The results of sibling fixed-effect models in Fig. 3 show a different pattern for GPA, as Fig. 2 for the random-effect models. Parental unemployment is not detrimental in early childhood when children are 7 years old or younger; however, it is at the ages of 14 and 15. Parental unemployment reduces treated siblings’ GPA on average with a standard deviation of 0.13–0.17. Because error terms (and confidence intervals) are much larger in sibling fixed-effect models, age differences are not statistically significant.

For general secondary enrollment, the negative effect of parental unemployment is found at the end of compulsory education when the treated siblings are 13–14 years old. Thus, parental unemployment again has a negative effect at the end of compulsory school. Parental unemployment decreases the probability of enrolling in general secondary school by on average 10 percentage points. This is also true for

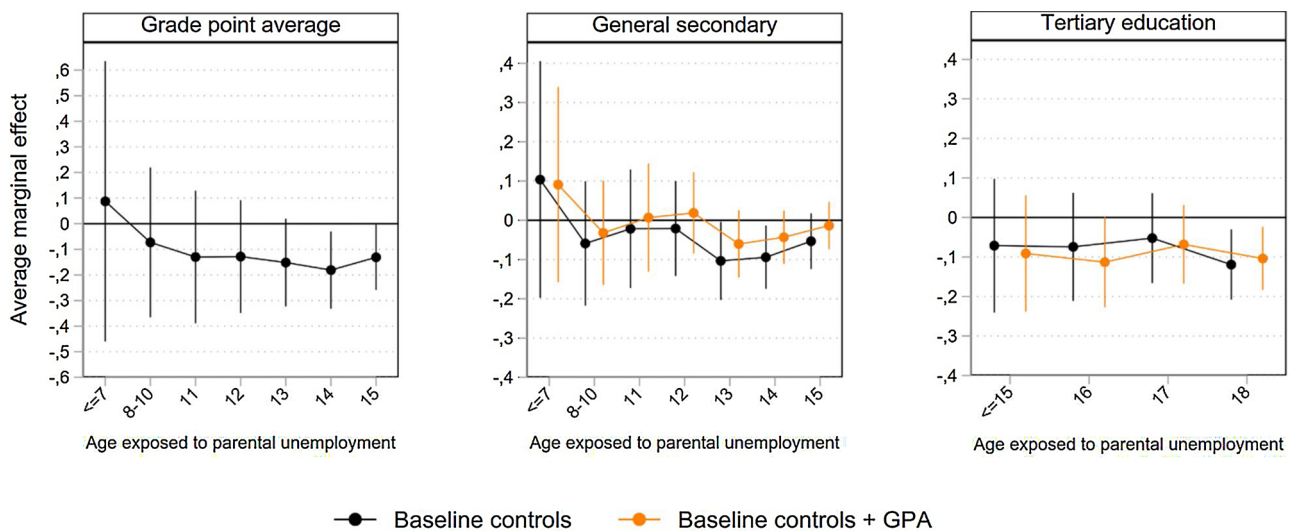


Fig. 3. The estimated effect of parental unemployment on children’s GPA (left panel), general secondary enrollment (center panel), tertiary enrollment (right panel) using sibling fixed-effects models, and average marginal effects. Note: Black symbols (baseline models) control for year of birth, birth order, child’s sex, duration of parental unemployment. Orange symbols control for baseline model’s variables and GPA. 95 % confidence intervals around the estimates.

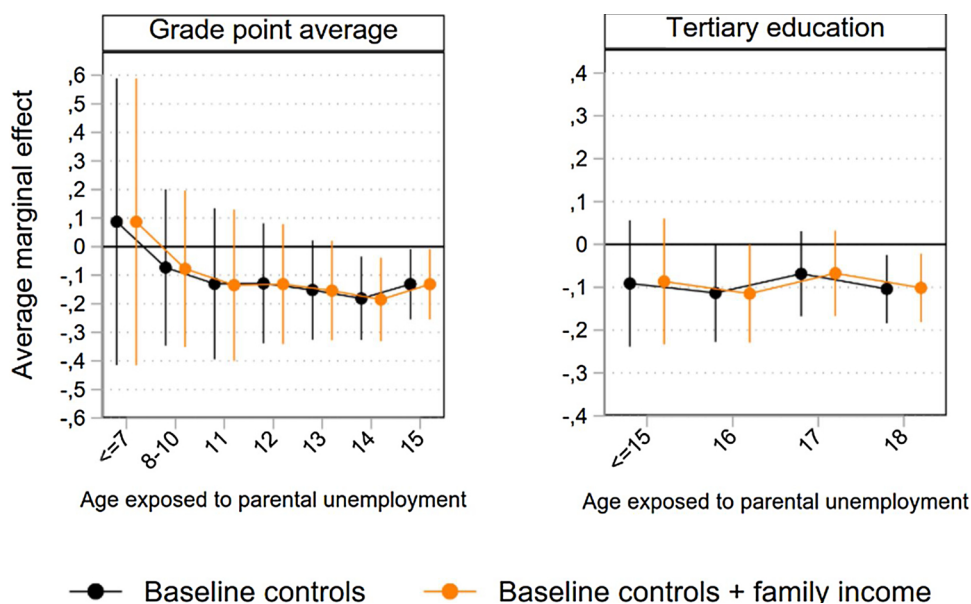


Fig. 4. The estimated effects of parental unemployment on children's GPA (left panel) and tertiary enrollment (right panel) without and with controlling for family income using sibling fixed-effects models and average marginal effects. Note: Black symbols (baseline models) control for year of birth, birth order, child's sex, duration of parental unemployment and for tertiary enrollment GPA. Orange symbols control for baseline model's variables and family income. 95 % confidence intervals around the estimates.

tertiary enrollment. The negative effect of the treatment group can be observed at the very end of secondary school when children are age 18. Parental unemployment reduces the probability of enrolling in tertiary education by on average 12 percentage points. As with secondary enrollment and GPA, this can again be observed at the age when further education choices are made.

When we control for GPA, the negative effect disappears entirely in the case of entry into general secondary education. In the case of tertiary education enrollment, the negative effect also decreases; however, the difference remains statistically and substantively significant, on average at 10.6 percentage points between the treatment and control groups. The previous studies have also reported the negative causal effect of parental unemployment on children's tertiary enrollment to be on average 10 percentage points in the US and Canada (Brand & Thomas, 2014; Coelli, 2011); however, in Germany, it is on average somewhat higher at 13 percentage points (Lindemann & Gangl, 2019).

We can conclude that for all three outcomes, parental unemployment is disadvantageous at the age when children are adolescents and understand the meaning of parental unemployment. This is also a time when children are at the end of compulsory education and when further education decisions are made. In our analysis, parental unemployment is not significantly detrimental in early childhood, the life-course stage when children's emotional and cognitive skills are still developing. However, our estimates at those ages have relatively large confidence intervals, and the lack of statistical power makes these conclusions less certain. Furthermore, the negative effect of parental unemployment for secondary enrollment is explained by lower school performance. However, school performance in compulsory education does not explain the negative effect of parental unemployment on tertiary enrollment at age 18. The results for GPA (and enrollment outcomes) also indicate that the negative effects of experiencing parental unemployment in early childhood in random-effects models are explained by the selection into unemployment and not by the causal effect of unemployment on children. Thus, fixed-effects models do not support Hypothesis 2 regarding the cumulative effects of parental unemployment with respect to age.

5.1. The mediating effects of family income

Next, we analyze whether family income explains the negative effect of parental unemployment on children's educational achievement as predicted by our Hypothesis 1. Because we found above that parental unemployment does not affect general secondary enrollment, these

analyses are conducted only for GPA and tertiary enrollment.

Fig. 4 shows how much controlling for differences in family income between treatment and control groups influences the negative effect of parental unemployment. The left-hand panel shows that family income is not related to the negative effect in the case of GPA - the black and orange lines overlap. The same can be observed for tertiary enrollment in the right-hand panel: family income does not explain the differences between siblings. In addition, the estimates for family income are small and not statistically significant (see Table A.6 in the Appendix in Supplementary material).

As a robustness check, we conducted the same analyses by splitting the incomes into deciles and including each decile into the models as dummy variables to test whether there are nonlinearities in the effects of family income. We found no mediating effect of family income in this analysis either (results available from the authors upon request). Finally, we conducted additional analyses by controlling for family income specifically at age 14–15 for GPA and at age 18 for tertiary education, which are the ages for which we found a negative effect of parental unemployment (see Appendix Table A.6b in Supplementary material). The results remained the same; we did not find any mediating effects of family income.⁵ Thus, we concluded that family income did not mediate the negative effect between parental unemployment and children's education. It should be noted that we used family income as measured before taxes. With other measures, the results may change; unfortunately, we did not have access to data for values measured after applying taxes and subsidies. With income being measured before tax, we underestimate the incomes of poor families receiving subsidies and overestimate the incomes of single-earner families, as the income tax system is progressive, and based on individual earnings. Overall, this may create slight biases in the analysis, but we expect these to be relatively minor.

5.2. Parental education

Finally, Table 2 shows the effects of parental unemployment according to parental education level. In the table, we distinguish two education levels for parents: parental education low is for siblings whose parents have vocational or lower education, and parental

⁵ We also conducted sensitivity analyses controlling family incomes before the age at which a child is exposed to parental unemployment and during the exposure age. However, the results remained the same.

Table 2

The estimated effects of parental unemployment on children's educational outcomes according to parental education level. Sibling fixed-effects models, average marginal effects.

	GPA		General secondary		Tertiary	
	1 Par edu low	2 Par edu high	1 Par edu low	2 Par edu high	1 Par edu low	2 Par edu high
Age exposed to parental unemployment (ref. No unemployment)						
≤7	-0,364 0,5	0,484 0,304	-0,167 0,246	0,328 0,191		
8–10	-0,462 0,245	0,165 0,177	-0,212 0,126	0,046 0,108		
11	-0,29 0,212	0,006 0,167	-0,009 0,128	-0,004 0,098		
12	-0,404* 0,204	0,032 0,13	-0,138 0,09	0,045 0,084		
13	-0,161 0,139	-0,143 0,113	-0,133 0,073	-0,078 0,071		
14	-0,304* 0,125	-0,094 0,096	-0,136* 0,065	-0,061 0,055		
15	-0,182 0,114	-0,085 0,078	-0,062 0,055	-0,037 0,049		
< 15					-0,107 0,125	-0,02 0,118
16					0,098 0,105	-0,142 0,094
17					-0,024 0,08	-0,059 0,082
18					-0,066 0,061	-0,152* 0,066
Female	0,577*** 0,062	0,565*** 0,047	0,181*** 0,034	0,202*** 0,025	0,023 0,042	0,172*** 0,039
family income (log)	0,04 0,058	0,231 0,199	-0,108* 0,047	0,208 0,138	0,04 0,202	0,085 0,246
Duration of unemployment ^a	0,004 0,004	-0,004 0,003	0,004 0,002	0,001 0,002	0,003 0,005	0 0,006
Year born	0,016 0,031	0,023 0,023	-0,023 0,015	-0,021 0,013	-0,032 0,021	-0,027 0,021
Birth order	-0,024 0,061	-0,095* 0,041	0,048 0,025	0,002 0,024	0,051 0,041	0,013 0,046
GPA missing	0,286 0,162	-0,350* 0,163				
BIC	1641,419	2583,136	490,53	823,675	142,588	450,559
N	927	1581	927	1581	730	1127

Standard errors in second row * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

^a Duration of parental unemployment is calculated for GPA and general secondary until children were 15 and for tertiary until children were 18.

education high is for the siblings whose parents have general secondary or higher education. In these models, we also control for family income. The purpose of these analyses is to further study whether higher educated parent's unemployment increases time discounting preferences in tertiary education enrollment as predicted by Hypotheses 3a and 3b, and/or whether higher parental education compensates the negative effects of unemployment as predicted by Hypothesis 4.

In the first two models, our outcome variable is children's GPA. These models show that only the children of lower educated parents are statistically significantly affected by parental unemployment at ages 12 and 14. The next two models are for general secondary education; again, parental unemployment has a statistically significant negative effect on siblings' general secondary enrollment among lower educated parents but not higher educated parents at ages 13–14. These findings support Hypothesis 4 that higher parental education protects children from the negative effects of parental unemployment. However, one should note that differences between the point estimates are not statistically significant, and thus we cannot definitively conclude the presence of differences between lower and higher levels of parental education.

However, in the next two models, which are for tertiary enrollment, we do find that parental unemployment has a detrimental effect among higher educated parents at age 18. This may indicate higher perceived risks in continuing tertiary education.

To test this further, we conducted analyses for tertiary enrollment where we controlled both GPA and education choice after compulsory school (whether the children were enrolled in the general secondary- or vocational education). The previous research indicates that, in Finland, children with advantageous educational family backgrounds have a higher probability of enrolling in the general secondary track than children do from disadvantageous educational backgrounds (Kilpi-Jakonen, Erola, & Karhula, 2016).

Table 3 shows the results when we control for GPA (model 1) and school selection (model 2) between siblings. As in the previous models in Table 2, we do not find any statistically significant estimates among siblings with lower educated parents in these models. However, we find a significant and substantial negative effect (on average 15 percentage points) among the siblings with higher educated parents when a child is 18 years old, during the last year of general secondary education, even when we control for both GPA and school selection (whether children choose vocational- or general secondary school) in model 2. However, the above mentioned differences between estimates for lower and higher levels of parental education are not statistically significant.

GPA differences and school selection between siblings among children from higher educated families do not explain away the negative effect of parental unemployment. This finding indicates that the children of better-educated parents are less likely to apply to tertiary education when they experienced parental unemployment at the very

Table 3

The estimated effects of parental unemployment on children's tertiary education enrollment according to parental education level when adjustments are made for GPA and education selection. Sibling fixed-effects models, average marginal effects.

	Par edu low	Par edu high	Par edu low	Par edu high
Age exposed to par unemployment (ref. No unemployment)				
< 15	-0.107 0.101	-0.057 0.1	-0.123 0.095	-0.059 0.099
16	0.016 0.079	-0.179* 0.082	0.033 0.08	-0.151 0.083
17	-0.076 0.077	-0.051 0.066	-0.067 0.071	-0.037 0.066
18	-0.034 0.056	-0.146** 0.057	-0.032 0.054	-0.147** 0.057
Female	-0.097** 0.04	-0.022 0.039	-0.085** 0.038	-0.042 0.038
Year of birth	-0.018 0.019	-0.018 0.02	-0.014 0.019	-0.002 0.02
Birth order	0.033 0.034	0.036 0.043	0.031 0.033	0.051 0.041
Duration of parental unemployment ^a	0.004 0.003	0.002 0.005	0.005 0.003	0.001 0.005
log family income	0.237 0.17	0.094 0.226	0.166 0.156	0.017 0.22
GPA	0.233*** 0.025	0.263*** 0.027	0.163*** 0.024	0.215*** 0.03
GPA missing	-0.149 0.101	-0.400* 0.11	0.038 0.125	-0.35*** 0.062
Vocational enrollment (ref. General sec)			-0.231*** 0.049	-0.204*** 0.046
BIC	13.951	235.874	-36.047	204.245
N	730	1127	730	1127

Standard errors in second row * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

^a Duration of parental unemployment is calculated until children were 18.

end of their secondary education careers or at the point of determining whether to prepare for entry exams for tertiary education programs. This supports Hypothesis 3a that the negative effect of parental unemployment on children becomes stronger as the parental level of education increases and Hypothesis 3b that the effect of parental unemployment is more detrimental just before educational transition periods.

Children with different levels of parental education might experience different selection processes upon entry to secondary education. The children with low parental education entering the general secondary track may have higher abilities on average than the children of highly educated parents, and this pattern, in turn, could bias the estimates of low and high parental education. We control for GPA at the end of primary school to account for this kind of selection, but unrelated selection might still exist. However, we believe that such a complex selection is unlikely to cause significant bias.

5.3. Additional analyses

Because our analysis also covers children who experienced parental separation before parental unemployment (approximately 19 % of the cases in the fixed-effect models), and the parents who were unemployed in the household were not always biological parents in our analyses, we conduct sensitivity analyses only for the cases where there were intact two-biological-parent families. In these analyses, we do not find any significant differences from the results reported above (see Appendix Table A.7a in Supplementary material). Further, Appendix Table A.7b in Supplementary material shows the estimates for the interaction between family type and exposure to parental unemployment without differentiating the age of exposure. The results from the Wald test show significant interaction when the outcome is GPA; however, the main

effect is significant for both intact and nonintact families but the coefficient is stronger for siblings who live in nonintact families when they experience parental unemployment. For enrollment outcomes, we do not find significant interaction terms between intact and nonintact families.

We also tested interactions between the sex of a child and age at parental unemployment. The analyses reported in Appendix Tables A.8a–A.8c in Supplementary material indicate that the effects of parental unemployment do not substantially differ between sons and daughters. The only interaction effect that we found to be significant was for GPA at age 15, when parental unemployment was only detrimental for sons but not for daughters. This indicates that there are only minor differences between sons and daughters.

Although we do not find any major differences between the effects of parental unemployment for sons and daughters, the analyses show significant negative effects for daughters but not for sons at age 18 when the outcome variable is tertiary enrollment. When the outcome variable is general secondary enrollment, we find a significant negative effect for sons but not for daughters at age 15. For general secondary enrollment, the effects are also marginally significant ($p < 0.10$) for both sons and daughters at the age of 14, and for sons at age 13. For GPA, we find that the effects are significant for sons at age 14 and marginally significant at ages 12 and 13.

However, the results of these analyses must be interpreted with caution because the error term grows rather large due to a lack of statistical power. To obtain more power, we conducted similar gender-interaction analyses without differentiating the age of exposure to specific effects, thus comparing those experiencing parental unemployment to those who do not (see Appendix Table A.9 in Supplementary material). For GPA, the effect of sons is somewhat stronger, and we also find marginally significant interaction; however, the main effect of daughters is also marginally significant but smaller. For secondary enrollment, we find significant effects for sons and marginally significant effects for daughters, but no significant interaction effect. For tertiary education enrollment, we find significant main effects for daughters, but no significant interaction effects. Thus, we cannot argue that parental unemployment is detrimental only for daughters or sons, but most likely it is detrimental for both.

Because there can be differences between the effects of paternal or maternal unemployment, we conducted separate analyses for the families in which siblings experience only maternal or paternal unemployment. The results reported in Appendix Tables A.1a and A.1b in Supplementary material show no statistically significant differences between the effects of maternal and paternal unemployment (confidence intervals overlap).

Although confidence intervals overlap, paternal unemployment seems somewhat more disadvantageous for children's GPA at ages 11 and 14. Additionally, only paternal unemployment is significant for tertiary enrollment at ages 16–18. Paternal unemployment is also significant for general secondary enrollment at ages 13–14, although it is not statistically significantly different from maternal unemployment. Thus, it seems that paternal unemployment is somewhat more disadvantageous for children's school performance and education selection than maternal unemployment at certain ages.

We also conducted these analyses without differentiating age-specific effects (see Appendix Table A.1b in Supplementary material), and the findings provide more support for our conclusion that there are some differences between the effects of mothers' and fathers' unemployment for tertiary enrollment. In Appendix Table A.1b in Supplementary material, the point estimate of paternal unemployment for tertiary enrollment is lower (and thus on average has a greater effect) than maternal unemployment, and the difference between effects is statistically significant. This finding supports status deprivation, which increases children's perceived risks in enrolling in tertiary education because fathers have higher occupational status and they are usually affected more by unemployment than mothers (see, e.g., Andersen, 2013).

Finally, Appendix Tables 2b–2d in Supplementary material show the random and fixed-effect analyses of the duration of parental unemployment. Table 2b shows a statistically significant linear effect in random-effect models for the duration of parental unemployment; however, when unobserved heterogeneity is taken into account in the fixed-effect models, we no longer find statistically significant effects. This might be partly due to methodological restrictions of the fixed-effect sample, as we exclude families in which the older sibling experienced parental unemployment before finishing her or his schooling. Due to this, we exclude permanently unemployed parents and many parents engaged in long-term or multiple short-term unemployment. While the duration of parental unemployment may still matter, we do not observe this in our models due to the restrictions cited above.

Because the duration of parental unemployment may have a nonlinear association with children's education outcomes, we categorized this variable into seven and three groups to test the nonlinear association. Appendix Tables 2c and 2d in Supplementary material show the results of the categorized variables. The random-effects models show for each outcome variable that longer parental unemployment would be more disadvantageous for children's education outcomes. However, the sibling fixed-effects models show that significant effects for general secondary and tertiary education enrollment occurred only when parental unemployment lasted for a shorter period, i.e., 1–5 months. However, for children's GPA, we found that parental unemployment lasting 19–25 months still had a significant negative effect. Thus, the duration of parental unemployment had more cumulative effects on children's school performance than for their educational choices.

These results may be attributed to families' abilities to adapt to parental unemployment. However, one should note that as explained above, we exclude many families experiencing long-term unemployment. While we do this for solid methodological reasons, the exclusion increases the standard errors of long-term unemployment coefficients. Thus, although long-term parental unemployment is not statistically significantly associated with children's educational choices in the fixed effects models, we cannot rule out the possibility that this is due to low statistical power regarding long-term unemployment. However, school performance may be a more path-dependent process that tends to accumulate over time. If this is the case, continual disadvantages in school performance followed by parental unemployment may accumulate in the same way.

6. Conclusion and discussion

In this article, we have studied the effects of parental unemployment with respect to children's ages and parental level of education on children's GPA and entry into general secondary and tertiary education in Finland, which can be considered a relative meritocratic Nordic welfare state. We used sibling fixed-effects models, which reduce selection bias on the parental level. The results show that parental unemployment has a negative effect on all three outcomes.

For children's GPA, parental unemployment can be considered to be more disadvantageous if it is experienced at the end of compulsory schooling. This suggests that unemployment does not have cumulative effects regarding a child's age but children's education performance is more vulnerable to parental unemployment in adolescence. The effect of parental unemployment in early childhood can be explained by selection into unemployment, and it is not a direct effect of unemployment.

For general secondary education enrollment, parental unemployment is disadvantageous at the end of compulsory schooling at age 13–14. The negative effect of unemployment on children's GPA explains this finding entirely. Thus, parental unemployment affects children's educational performance, not by making children perceive general secondary more risky choice. These results are in line with the previous studies (Andersen, 2013; Brand & Thomas, 2014; Bratberg et al., 2008; Kalil & Ziol-Guest, 2008). However, we do find a compensation

mechanism for the negative effects of children's GPA and general secondary education: children with higher parental education do not experience the negative effects of parental unemployment.

For tertiary education enrollment, parental unemployment has a negative influence when children are 18 years old and are thus at the very end of secondary school, even after controlling for GPA and school track; however, this relationship is statistically significant only among the children of more educated parents but not among the children of less educated parents. Furthermore, we found evidence that at age 18, only paternal unemployment is detrimental to children's tertiary enrollment. These analyses indicate that the most plausible explanatory mechanism behind the negative effects of unemployment is the relative risk aversion that it induces. The children of highly educated parents exposed to parental unemployment and thus a decline in the family's status decline perceive uncertainties in higher education and are less likely to enroll in higher education as a result. Parental unemployment may strengthen children's time discounting preferences in educational decisions. The children of the unemployed are likely to value short-term benefits of educational track choices. This is the age at which children are deciding whether they intend to pursue higher education or whether they will enter the labor market. As a result, the perceived cost of higher education for children who have experienced parental unemployment may be higher. At the age of deciding between secondary tracks, these costs are likely to be perceived as much lower. Both secondary education tracks in Finland allow for the continuation to tertiary education, and securing employment without a secondary education degree is highly unlikely. Our findings are also similar to the results of previous studies (Andersen, 2013; Brand & Thomas, 2014).

Although previous studies on liberal regimes, such as the US and Canada, have found that income mediates the negative effect of parental unemployment on children's education attainment (Coelli, 2011; Jencks & Tach, 2006), we do not find any support for the importance of reduced family economic resources due to unemployment in children's education. This result indicates that a strong social security system and tuition-free education eliminate the effects of family income in Finland (see also Ekhaugen, 2009 for Norway). In Finland, earnings related unemployment allowance that lasts 500 unemployed days compensate large part of the income loss followed from unemployment, and parents do not have to save money for children's education due to Finnish free educational system. Furthermore, children from low-income families can have student allowance already at secondary school. However, one should note that fixed effects models do exclude many families experiencing extremely long periods of unemployment or multiple short-term periods of unemployment over long periods, as we exclude families in which the older sibling experienced parental unemployment before educational choices were made. Thus, our results do not exclude the potentially harmful effects of very long-term periods of unemployment and economic stress.

In our additional analyses, we did not find support for the claim that long-term parental unemployment would be more disadvantageous for children's educational enrollment; however, longer unemployment spells are disadvantageous for school performance. Thus, the duration of parental unemployment seems to have cumulative effects at least by having a negative effect on school performance. Thus, in light of these results, it seems that the Finnish welfare state compensates in particular for the cumulative effects of parental unemployment on children's education enrollment but not entirely on their education performance. However, as noted above, this conclusion may be unwarranted when our models exclude too many families that have experienced long-term unemployment.

Of the mechanism introduced in the theoretical section, we found support for the compensation for secondary education. However, in tertiary education, the negative effect of parental education flips over and only the children of the higher educated parents are influenced by unemployment when they choose whether to continue to tertiary education. This indicates that relative risk aversion and altered time

discount preferences related to educational decisions begin matter more when children are experiencing parental unemployment.

Our method and the source of information—sibling fixed-effect models and register data—can be considered to yield reliable results compared to the previous studies that apply survey data with estimation methods that do not account for unobserved heterogeneity; however, our study also has limitations in addition to the ones mentioned above. First, in the sibling fixed-effect models, we include only families with at least two siblings, and the families with one child are excluded from the analysis. Second, it has been noted that sibling fixed-effect models can lead to biased estimates if the confounders are not completely shared among siblings (for example, see Frisell et al., 2012). We have taken into account some of these confounders by controlling for children's gender, birth year, siblings' birth order, the duration of parental unemployment, grade point averages and family income, all factors that vary among siblings. Additionally, with our dataset, we cannot fully control for other factors that vary among siblings; thus, future research should take these factors into account. For instance, children's poor health may lead to parental unemployment instead of the opposite causal relationship, and both the poor health and the ensuing parental unemployment may have an impact on children's educational achievement. In addition, parenting styles that differ among siblings could bias the results. This assumption of an equal investment in children is an important one in the sibling literature and is discussed in more detail by Conley (2008). In the egalitarian context of Finland, previous studies have been shown that the biases related to different treatments and attitudes are negligible (Björklund, Eriksson, Jäntti, Rauum, & Österbacka, 2004; Tulviste & Ahtonen, 2007). There are no major economic or cultural reasons to favor one child over the others: education is free and norms relating to birth order and gender are equal compared to other European countries (Hank & Kohler, 2000; Stickney & Konrad, 2007). We further controlled for siblings' birth orders and years of birth to capture some of these effects.

We are confident in stating that, at least in Finland, although education is free of charge and social security is generous, parental unemployment still has some detrimental effects for children's educational outcomes at adolescence just before educational transitions. The fact that we do not find a mediating effect of family income between parental unemployment and children's educational outcomes makes it difficult to combat against the negative effects of parental unemployment only by increasing governmental social benefits for the parents. The results indicate that if we want to reduce the negative effects of parental unemployment, we should rather try to ensure that the experiences of parental unemployment do not interfere with the educational decisions and children's school performance. Because it is practically impossible to target support only for the children of the unemployed, schools should ensure equal access to information and support for the disadvantaged students at the time the educational track choices are made. One way of doing this is to increase the amount of student counselling during the final years of the compulsory and secondary education. This would be crucial especially during periods of high unemployment rates.

Funding

This work was supported by European Research Council Consolidator grant [ERC-2013-CoG-617965] and the Academy of Finland Flagship Programme [grant number: 320162]. Erola and Karhula further acknowledge funding from the NORFACE DIAL project EQUALLIVES and Strategic Research Council at the Academy of Finland project TITA [grant number: 293103].

Acknowledgements

The draft version of this article has been presented in the 2016 Spring Meeting of ISA Research Committee on Social Stratification and

Mobility (RC28) in Singapore, European Consortium for Sociological Research (ECSR) conference 2016 in Oxford and Turku Center for Welfare Research seminar. The authors thank all participants for their valuable comments in these events and especially Irene Prix for her helpful suggestions on the modeling procedures. We also thank the two anonymous referees for their valuable comments and suggestions.

Appendix A. Supplementary data

Supplementary material related to this article can be found, in the online version, at doi:<https://doi.org/10.1016/j.rssm.2019.100439>.

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, 477–488.
- Barone, C., Triventi, M., & Assirelli, G. (2018). Explaining social inequalities in access to university: A test of rational choice mechanisms in Italy. *European Sociological Review*, 34, 554–569.
- Barone, C., Assirelli, G., Abbiati, G., Argentin, G., & De Luca, D. (2018). Social origins, relative risk aversion and track choice: A field experiment on the role of information biases. *Acta Sociologica*, 61(4), 441–459.
- Becker, G. S., & 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., & 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., & Boado, H.-C. (2014). Previous school results and social background: Compensation and imperfect information in educational transitions. *European Sociological Review*, 30, 207–217.
- Blau, P. M., & Duncan, O. D. (1967). *The American occupational structure*. New York: Wiley.
- Boudon, R. (1974). *Education, opportunity, and social inequality: Changing prospects in western society*. New York: Wiley.
- Brand, J. E. (2015). The far-reaching impact of job loss and unemployment. *Annual Review of Sociology*, 41, 359–375.
- Brand, J. E., & Thomas, J. S. (2014). Job displacement among single mothers: Effects on children's outcomes in Young Adulthood. *The American Journal of Sociology*, 119, 955–1001.
- Bratberg, E., Nilsen, Ø., & Vaage, K. (2008). Job losses and child outcomes. *Labour Economics*, 15, 591–603.
- Breen, R., & Goldthorpe, J. (1997). Explaining educational differentials towards a formal rational action theory. *Rationality and Society*, 9, 275–305.
- Breen, R., & Yaish, M. (2006). Testing the Breen-Goldthorpe model of educational decision making. In S. L. Morgan, D. B. Grusky, & G. S. Fields (Eds.). *Mobility and inequality* (pp. 232–258). Stanford California: Stanford University Press.
- Breen, R., van de Werfhorst, H. G., & Jäger, M. M. (2014). Deciding under doubt: A theory of risk aversion, time discounting preferences, and educational decision-making. *European Sociological Review*, 30, 258–270.
- Brooks-Gunn, J., & Duncan, G. J. (1997). The effects of poverty on children. *The Future of Children*, 7, 55–71.
- Björklund, A., Eriksson, T., Jäntti, M., Rauum, O., & Österbacka, E. (2004). Family structure and labour market success: The influence of siblings and birth order on the earnings of young adults in Norway, Finland and Sweden. In M. Corak (Ed.). *Generational income mobility in North America and Europe* (pp. 207–225). Cambridge: Cambridge University Press.
- Björklund, A., Eriksson, T., Jäntti, M., Raaum, O., & Österbacka, E. (2002). Brother correlations in earnings in Denmark, Finland, Norway and Sweden compared to the United States. *Journal of Population Economics*, 15, 757–772.
- Clark, A., Georgellis, Y., & Sanfey, P. (2001). Scarring: The psychological impact of past unemployment. *Economica*, 68, 221–241.
- Coelli, M. B. (2011). Parental job loss and the education enrollment of youth. *Labour Economics*, 18, 25–35.
- Conley, D. (2008). What do low (or high) sibling correlations tell us about social ascription? In D. B. Grusky (Ed.). *Social stratification. Class, race, and gender in sociological perspective* (pp. 596–609). (3rd ed.). Boulder CO: Westview Press.
- DiPrete, T. A., & Eirich, G. M. (2006). Cumulative advantage as a mechanism for inequality: A review of theoretical and empirical developments. *Annual Review of Sociology*, 32, 271–297.
- Duncan, G. J., & Brooks-Gunn, J. (2000). Family poverty, welfare reform, and child development. *Child Development*, 71, 188–196.
- Duncan, G. J., Yeung, W. J., Brooks-Gunn, J., & Smith, J. R. (1998). How much does childhood poverty affect the life chances of children? *American Sociological Review*, 63, 406–423.
- Duncan, G. J., Ziol-Guest, K. M., & Kalil, A. (2010). Early-childhood poverty and adult attainment, behavior, and health. *Child Development*, 81, 306–325.
- Ekhaugen, T. (2009). Extracting the causal component from the intergenerational

- correlation in unemployment. *Journal of Population Economics*, 22(1), 97–113.
- Erikson, R., & 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, 307–327.
- Erola, J., Jalonen, S., & 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.
- Erola, J., & Jalovaara, M. (2017). The replaceable: The inheritance of paternal and maternal socioeconomic statuses in non-standard families. *Social Forces*, 95, 971–995.
- Frisell, T., Öberg, S., Kuja-Halkola, R., & Sjölander, A. (2012). Sibling comparison designs: Bios from non-shored confounders and measurement error. *Epidemiology*, 23, 713–720.
- Galambos, N. L., & Silbereisen, R. K. (1987). Income change, parental life outlook, and adolescent expectations for job success. *Journal of Marriage and the Family*, 49, 141–149.
- 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, 546–557.
- Grätz, M., Barclay, K. J., Wiborg, Ø., Lyngstad, T. H., Karhula, A., Erola, J., et al. (2019). *Universal family background effects on education across and within societies*. MPIDR Working Paper WP 2019-007.
- Hank, K., & Kohler, H. P. (2000). Gender preferences for children in Europe: Empirical results from 17 FFS countries. *Demographic Research*, 2.
- Hansen, H.-T. (2005). Unemployment and marital dissolution. *European Sociological Review*, 21, 135–148.
- Hanson, J. L., Hair, N., Shen, D. G., Shi, F., Gilmore, J. H., Wolfe, B. L., et al. (2013). Family poverty affects the rate of human infant brain growth. *PLoS One*, 8, e80954.
- 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, 166–179.
- Holm, A., & Jæger, M. M. (2008). Does relative risk aversion explain educational inequality? A dynamic choice approach. *Research in Social Stratification and Mobility*, 26, 199–219.
- Jahoda, M. (1982). *Employment and unemployment: A social-psychological analysis*. Cambridge: Cambridge University Press.
- Jencks, C., & Tach, L. (2006). Would equal opportunity mean more mobility? In S. L. Morgan, D. B. Grusky, & G. S. Fields (Eds.). *Mobility and inequality* (pp. 23–58). Stanford California: Stanford University Press.
- Jäntti, M., Bratsberg, B., Roed, K., Raauum, O., Naylor, R., Osterbacka, E., & Eriksson, T. (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., & Tversky, A. (1979). Prospect theory: An analysis of decision under risk. *Econometrica: Journal of the econometric society*, 47, 263–291.
- Kalil, A., & Ziolo-Guest, K. M. (2008). Parental employment circumstances and children's academic progress. *Social Science Research*, 37, 500–515.
- Karhula, A., Lehti, H., & Erola, J. (2017). Intergenerational scars? Long-term effect of parental unemployment during depression on socioeconomic achievement. *Research on Finnish Society*, 10, 87–99.
- Karhula, A., Erola, J., Raab, M., & Fasang, A. (2019). Destination as a process: Sibling similarity in early socioeconomic trajectories. *Advances in Life Course Research*, 40, 85–98.
- Kilpi-Jakonen, E., Erola, J., & Karhula, A. (2016). Inequalities in the haven of equality? Upper secondary education and entry into tertiary education in Finland. In H.-P. Blossfeld, S. Buchholz, J. Skopek, & M. Triventi (Eds.). *Models of secondary education and social inequality: An international comparison* (pp. 181–196). Cheltenham: Edward Elgar.
- Levine, P. B. (2011). How does parental unemployment affect children's educational performance? In G. J. Duncan, & R. J. Murnane (Eds.). *Whither opportunity? Rising inequality, schools, and children's life chances* (pp. 315–358). New York: Russell Sage Foundation.
- Lindemann, K., & Gangl, M. (2018). *Parental unemployment and the transition into tertiary education: Can institutions moderate the adverse effects?* Frankfurt: Goethe University CORRODE Working Paper #4. Retrieved from www.corrode-project.org, version dated 28 February 2018.
- Lindemann, K., & Gangl, M. (2019). The intergenerational effects of unemployment: How parental unemployment affects educational transitions in Germany. *Research in Social Stratification and Mobility*, 62, 1–12.
- Martikainen, J. (2003). The shares of involuntary and voluntary unemployment in Finland. (Tahattoman ja vapaa-ehtoisen työttömyyden osuudet Suomessa.). *Finnish Economic Journal/Kansantaloudellinen aikakauskirja*, 99, 59–71.
- Merton, R. K. (1968). The Matthew effect in science: The reward and communication systems of science are considered. *Science*, 159, 56–63.
- Mincer, J. (1974). *Schooling, experience, and earnings*. New York: Columbia University Press.
- Nilsen, Ø. A., & Reiso, K. (2011). *Scarring effects of unemployment*. NHH Dept. of Economics Discussion Paper 26.
- Oreopoulos, P., Page, M., & Stevens, A. H. (2008). The intergenerational effects of worker displacement. *Labour Economics*, 26, 455–483.
- Prix, I., & Erola, J. (2017). Does death really make us equal? Educational attainment and resource compensation after paternal death in Finland. *Social Science Research*, 64, 171–183.
- Powdthavee, N., & Vernoit, J. (2013). Parental unemployment and children's happiness: A longitudinal study of young people's well-being in unemployed households. *Labour Economics*, 24, 253–263.
- Rege, M., Kjetil, T., & Votruba, M. (2011). Parental job loss and children's school performance. *The Review of Economic Studies*, 78, 1462–1489.
- Sigle-Rushton, W., Lyngstad, T. H., Andersen, P. L., & Kravdal, Ø. (2014). Proceed with caution? Parents' union dissolution and children's educational achievement. *Journal of Marriage and the Family*, 76, 161–174.
- Stevens, A. H., & Schaller, J. (2011). Short-run effects of parental job loss on children's academic achievement. *Economics of Education Review*, 30, 289–299.
- Stickney, L. T., & Konrad, A. M. (2007). Gender-role attitudes and earnings: A multinational study of married women and men. *Sex Roles*, 57, 801–811.
- Ström, S. (2003). Unemployment and families: A review of research. *The Social Service Review*, 77, 399–430.
- Tulviste, T., & Ahtonen, M. (2007). Child-rearing values of Estonian and Finnish mothers and fathers. *Journal of Cross-cultural Psychology*, 38, 137–155.