



Mapineq

Economic circumstances of children living in higher and lower educated families and the contribution of household structure: Comparison of 11 European countries

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Executive summary

Childhood family composition and household structure have important implications for children's diverging economic circumstances. Children's living environments and household structures vary substantially across parental education groups. We explore how much these differences in household structures explain the diverging economic circumstances between children living in higher and lower-educated households. With highly educated households, we refer to families in which at least one adult has completed a tertiary-level degree. Secondly, we study how this varies across and within European countries. We apply the cross-nationally comparable Generations and Gender Survey (GGS-I) comparing 11 European countries to study these questions. Our unit of analysis is a child, as the main focus is on the economic circumstances of children living in higher and lower-educated households, and our results are based on around 60,000 children.

1. Across European countries, children living in highly-educated households live more often in two-adult families, have fewer siblings living with them, and their parents have been older when entering parenthood than others.

Around a third of children had at least one highly educated adult living in the same household with them, but the proportion varies substantially across countries. There is a rather strong educational gradient in the household structure, as has been found in previous studies. Our results show that children with highly educated parents more often live in two-parent households, have fewer siblings living in the household, and their parents have entered parenthood at an older age.

2. In each country studied, children living in highly educated households have better economic circumstances. The importance of education for the income gap varies more across countries than across regions.

In each country studied, children living with highly educated parents also end up having better economic circumstances on average compared to others. This educational gap in equivalence-scaled household income varies quite substantially between countries, being smallest in Poland, Netherlands and Norway and largest in Romania. The importance of parental education on children's economic circumstances was found to be more similar within countries than across countries.

3. Differences in economic circumstances between higher and lower-educated families are partly explained by differences in household structure.

Overall, our results indicate that around Europe, the economic circumstances of children are strongly tied to their parents' education level. In addition, differences between education groups in terms of single parenthood and number of children also contribute to differences in children's economic circumstances. This is confirmed by decomposition analysis. Thus, the better economic circumstances of children in highly educated households are not only due to differences in parents' educational returns. Even though we found some variation across countries and regions in how much the household structure explains differences between education groups, the general pattern was found to be rather similar, especially within countries.



Abbreviations

UTU University of Turku

UNED National Distance Education University

GGS Generations and Gender Survey

NUTS Nomenclature of Territorial Units for Statistics

RIRS Random-intercept-random-slope



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Economic circumstances of children living in higher and lower educated families and the contribution of household structure: Comparison of 11 European countries

We study the contribution of household structure to the educational group income gap with cross-nationally comparable GGS data, including also regional information. We extend our perspective and unit of analysis from adults to children living in the households and study differences in children's economic circumstances between higher and lower-educated families in multiple national and regional contexts. We aim to distinguish the contribution of household structure to the education group income gap and study whether there is geographical variation in how much this explains the education group differences in children's economic circumstances. More specifically, we ask: 1) how much are the differences in economic circumstances of children living in higher and lower-educated households due to differences in household structure? And 2) does this vary between European countries and regions?

Across European countries, children living in highly-educated households live more often in two-adult families, have fewer siblings living with them, and their parents have been older when entering parenthood compared to others.

In each country studied, children living in highly educated households have better economic circumstances. The importance of education for the income gap varies more across countries than across regions.

Differences in economic circumstances between higher and lower educated families are partly explained by differences in the household structure.



1. Introduction

This study revisits the discussion surrounding income disparities between education groups, but from a novel angle using a child perspective and assessing the extent to which household structure can explain the education group income gap. The research is situated in the intersection of three decisive societal transformations: the large-scale educational expansion during the 20th century, which has been expected to bring about greater equality (Breen, 2010); a resurgence in income inequality observed in both Europe and the US (Alvaredo et al., 2013; Hoffmann et al., 2020; Keeley, 2015); and the second demographic transition, which has shaken up conventional family structures through declining marriage and fertility rates and increasing rates of cohabitation and divorce (Lesthaeghe, 2010) mostly in a socially stratified way leading to ‘diverging destinies’ of children (McLanahan, 2004). The study explores the relationships between parental education, household structure and children’s economic circumstances across and within 11 European countries.

This introduction reviews the previous literature on the relationships between education, household structure and household income. These sections are followed by a presentation of the research design used in this paper and the results.

1.1. Returns to education

In post-industrial societies, a higher education level is generally expected to lead to higher earnings (Carrieri et al., 2023; Rodríguez-Pose & Tselios, 2012). According to human capital theory, higher levels of education increase one’s human capital, leading to higher productivity in the labour market, which can then be observed as higher earnings (Becker, 1964). The term ‘returns to education’ denotes the economic benefits an individual or society derives from increasing the amount of education (Patrinos, 2016). For instance, Montenegro and Patrinos (2023) estimated the global average education returns at nearly 10%, meaning that the average income increases this much for each additional school year, but there is a large variation across contexts.

According to Becker and Chiswick (1966), the greater the inequality of opportunity in education, the greater the average returns of education, and consequently, the greater the inequality in earnings. In general, the appeal of higher levels of schooling is stronger in contexts where the returns to education are higher (Becker, 1964; 1967). Moreover, while focusing mainly on North America, Becker and Chiswick (1966) observed that although education explained a notable part of earning inequalities within regions, it explained an even larger part of inequalities between regions (e.g. the Southern US vs. non-Southern US) with substantial differences in education opportunities.

The returns to education are highest for university graduates (Montenegro & Patrinos, 2023), and the expansion of access to tertiary education is regarded as pivotal in mitigating disparities in future life outcomes, including inequalities in earnings between socioeconomic groups (Carrieri et al., 2023). In the OECD countries, the median wealth in households headed by tertiary-educated adults is around twice that of households without tertiary-educated adults (OECD, 2020).

Education does not necessarily have a direct causal effect on income (Patrinos, 2016). For instance, the pathway between the two is often altered by family formation and household structure (e.g. Bernardi et al., 2019; Härkönen, 2017), as discussed below.

1.2. Household structure and educational background

Despite the sweeping changes in household structures brought about by the second demographic transition (Lesthaeghe, 2010), significant heterogeneity persists in family formation patterns across countries and regions. In Southern Europe, marked by a Catholic culture and traditional family norms, family formation typically occurs later, and partnerships tend to be more stable compared to many other European countries (Andersson et al., 2017). Similarly, in post-communist countries, the timing of family formation has been delayed compared to earlier cohorts, but partnerships are more susceptible to divorce and separation (Andersson et al., 2017). In Nordic countries, which are characterised by a liberal Protestant culture, cohabitation and union dissolution are more prevalent (Perelli-Harris & Lyons-Amos, 2016). Notably, cohabitation tends to be less stable than marriage (Jalovaara & Andersson, 2023).

Changes in family formation are partly attributed to the rise in women's education level, which has increased their labour market participation and financial independence (Lesthaeghe, 2010). Indeed, the proportion of highly educated women has grown in most countries, while the share of women with low education has declined (Perelli-Harris & Lyons-Amos, 2016). Additionally, traditional gender roles within marital relationships, where the man is the primary breadwinner and the woman is the caretaker, have become less pronounced, with responsibilities and income generation becoming more egalitarian (Perelli-Harris & Lyons-Amos, 2016).

Researchers have shown increasing interest in the diverse family formation patterns among education groups, often concentrating on Nordic countries, where the availability of full population registers has provided a fertile ground for investigation. For instance, Jalovaara and Andersson (2023) recently observed that a decline in marriage rates and an increase in cohabitation and union instability have become particularly pronounced among the least educated groups in Finland. The authors suggest this trend may be linked to more generalised labour market marginalisation of individuals with basic education, an aspect which also affects their partnership opportunities.

The education gradient of family-related behaviours such as divorce also evolves over time. Härkönen and Dronkers (2006) illustrate how divorce, initially mainly practised by higher-educated individuals due to its high social and economic costs, became more common among less-educated individuals when its incidence increased.

However, Perelli-Harris and Lyons-Amos (2016), who studied women's partnership patterns across 15 countries, argue that country context matters more than education level in partnership patterns. They suggest that education level primarily affects the timing of marriage or union formation, with higher education groups tending to marry later and lower education groups marrying earlier on average. Additionally, while cohabitation is increasingly common across cohorts and countries, among higher education groups, it often serves as a transition stage before marriage, which tends to happen after the completion of studies (Perelli-Harris & Lyons-Amos, 2016).

Also, household size appears to be related with education level and socioeconomic status. Interestingly, although most children are born within coresidential unions (Nitsche et al., 2018), the research literature tends to focus on women (instead of couples) when discussing the number of children. Brzozowska et al. (2022) found that the decline in the number of children associated with the second demographic transition initially began among highly educated women, as motherhood represented greater opportunity costs for them. However, over time, the relationship between education and household size became more complex.

Evidence from several countries suggests a fertility polarisation between and within education groups. This is particularly notable among the less educated, where childlessness and large household sizes (3+) have become increasingly common (Brzozowska et al., 2022; Jalovaara et al., 2019), though with variation across countries. Notably, women with lower levels of education tend to be younger at first birth compared to women with a university degree (Brzozowska et al., 2022). Low education level has also become an increasingly common characteristic of single parents (Härkönen et al., 2023). The high number of children among the less educated has been associated with a greater incidence of unintended fertility, partnership instability, and having multiple partners (Härkönen & Dronkers, 2006; Jalovaara et al., 2022; Wood et al., 2014). Some authors have explained the higher incidence of partnership dissolution with lower conflict-solving skills among less educated individuals (Kreidl et al., 2017). Furthermore, a weaker labour market position of people with lower education levels is associated with multiple partnerships, while it also increases their risk of financial difficulties and stress and possibly less dedicated parenting (Jalovaara et al., 2022).

Within the higher education group, childlessness was prevalent across Europe before the 1960s (Wood et al., 2014). However, Brzozowska et al. (2022) note that in the subsequent period, characterised by a decline in the two-child model and an increased variation in household size, childlessness became more common among women with lower education levels compared to those with higher education. Conversely, the one-child family model became more prevalent in the latter group. The authors attribute this trend to the necessity for higher-educated women to balance work and family life (Brzozowska et al., 2022). In Nordic countries, higher-educated women tend to have slightly larger families. Still, as forerunners in the second demographic transition (Jalovaara & Andersson, 2023), with "above-average family-friendly and gender-equal" policies (Brzozowska et al., 2022), these nations may display unique family formation patterns compared to others.

As women's average education level has risen, the traditional hypergamous partnership, where a woman marries upward, has become less prevalent (Nitsche et al., 2018). This observation prompted Nitsche et al. (2018) to investigate how the combined education of both partners relates to family size using data from 25 European countries. Their findings indicate that highly educated homogamous couples are most likely to have two or more children, although these couples tend to enter parenthood later than couples with different education combinations. The authors interpret this as support for Oppenheimer's perspective (1994, 1997), which suggests that women's higher education and the eventual dual-earner household model with shared income provide greater economic stability and encourage childbearing. The results of Nitsche et al. (2018) challenge the

ideas of Becker (1993) and the traditional familial perspective, which argues that a clear division of labour between male breadwinners and female caretakers is the most conducive to childbearing, reducing the opportunity costs of parenthood for women.

Based on these theoretical and empirical premises, we expect to find children with higher educated parents more likely to grow up in dual-earner households, which positively impacts their economic circumstances. In contrast, we anticipate that children of lower-educated parents are comparatively more likely to grow up in households led by a single parent with significantly inferior economic circumstances.

1.3. Equivalised income and household structure

Research on income differences is typically based on data calculated from the total household income divided by the number of household members, taking into account economies of scale. Hence, the resulting individual income hinges on the household composition (e.g., Förster & d'Ercole, n.d.). However, more factors related to the household composition, other than just the number of members, affect the household income.

A stable dual-earner marriage or partnership with shared income is generally advantageous. It supports a higher standard of living for all household members, particularly when both parties are high earners (Perelli-Harris & Lyons-Amos, 2016).

Assortative mating, i.e. the greater propensity for partnerships between individuals with similar levels of education, has been identified as a potential driver for increased socioeconomic inequalities (Erola & Kilpi-Jakonen, 2022). However, women's educational expansion has resulted in a greater occurrence of hypogamous couples, where women mate with men with a lower education level than themselves. Subsequently, an increasing number of women have come to earn more than their male partners (Nitsche et al., 2018). In essence, the household's main breadwinner tends to be the spouse with a higher level of education, irrespective of gender (Esteve et al., 2016). Nevertheless, more than assortative mating, the number of adults within a household may be more crucial for differences between families (Erola & Kilpi-Jakonen, 2022). Therefore, in the present study, we focus on whether at least one adult has completed a tertiary-level degree and control for the number of adults living in the household.

Generally, empirical research appears to support the idea that a higher shared income contributes to relationship stability (Perelli-Harris & Lyons-Amos, 2016), whereas financial difficulties and employment instability or unemployment relate to increased conflicts in the relationship and a heightened risk of couples ending in separation (Kessler et al., 2023; Lyngstad & Jalovaara, 2010; Maitoza, 2019).

Moreover, the income levels of households headed by very young parents tend to be compromised by their early parenthood and an incomplete education path. Women's earnings levels usually decline rapidly when becoming mothers (McLanahan & Percheski, 2008; Miller, 2011), with the first birth exerting the strongest negative effect (De Hoon et al., 2017). Therefore, the timing of motherhood matters for earnings, and delaying the first birth tends to be financially beneficial (McLanahan & Percheski, 2008). For instance, Miller (2011) shows that in the US, for each year of delay in motherhood, the cumulative early



career earnings of a woman increase on average by 9%, and for university graduates, the increase is even higher.

Similarly, Johansen et al. (2020) show that young adults in Denmark who became parents before the age of 21 had not fully caught up with their non-young parent coevals by the age of 35 in terms of education, employment or earnings. However, the authors point out that early parenthood is relatively more common among individuals whose own parents were low-educated, young parents and/or foreign-born, factors which moderate the relationship between early parenthood and education.

It should be noted that the studies on dual-earner households rely strongly on the assumption of pooling of income within the household where each member gets an equalised share (Erola & Kilpi-Jakonen, 2022). Often, however, this is not a realistic assumption. As shown by Bennett (2013), there is a large variation of intrahousehold systems to deal with the sharing of earnings, including the independent management system, where both partners manage and decide upon their own monies, as well as the house-keeping allowance system, where only a set value is contributed for shared household expenses while the rest is kept by the earner. In addition, even in the pooled model, subtle power dynamics, gender norms, hierarchies between male and female earnings, etc., often establish several limitations to women's equal access to household income (Bennett, 2013; Kulic, 2021). Nonetheless, for the time being, there are no good solutions for a more accurate way of measuring the individual level income of those who live in households headed by two adults.

In the context of the present study, we use the equalised income as the outcome variable. However, we interpret the results considering these caveats related to the assumption of equal income distribution.

During the second demographic transition, education, employment, and income have gained importance for the selection into partnership for both men and women, which explains why a low level of education, unemployment and low income increasingly often lead to singlehood (Erola & Kilpi-Jakonen, 2022). According to Eurostat Household composition statistics, approximately 13% of families with children in the EU region were headed by a single parent in 2022. However, families with a single adult with or without children represent the fastest-growing household type in the EU for the past 15 years (Eurostat, 2023). As the relative share of less educated individuals among single parents has grown, the employment gap between single and partnered parents has widened, and the risk of poverty in single-headed households has increased even in Nordic countries (Härkönen et al., 2023; Alm et al., 2020).

To calculate equalized household income, the number of children in the household has to be taken into account. Theoretically, the resource dilution model establishes that parental resources, including time, emotional, physical, and financial resources, are limited and gradually diminished by each additional child in the household (Downey, 1995; Steelman et al., 2002). According to Downey (1995), however, the rate of dilution depends on children's age and varies by the type of resource; savings and monetary resources usually are divided equally between the children, while material resources (such as access to a computer) are only diluted after a certain threshold (e.g. 3–4 children). In practice,

there are several possible formulas for considering the resource dilution within a household when calculating the equivalised income (Förster & d'Ercole, n.d.). Our approach in this paper is square root equivalence scaling. This often-used approach does not make a difference between adults and children.

Building on earlier literature, we expect to find the household structure mediating the relationship between parental education and children's economic circumstances, explaining a substantial part of the variation in economic outcomes between children from higher and lower-educated households. In addition, we anticipate that the extent to which household structure explains diverging economic circumstances between children from higher and lower-educated households varies within and between European countries but mostly between countries.

2. Research design

2.1. Aims of the study

Against this background, we ask, how much are the differences in economic circumstances of children living in higher and lower-educated households due to differences in household structure? And does this vary between European countries and regions? In other words, we study whether the better economic circumstances of children living in higher-educated households are due to the differences in household structures among education groups and how this varies across and within countries.

Based on previous research, it is known that higher-educated families differ from lower-educated families in many ways, such as in family formation or household income: families with lower parental education, for example, usually have more children and lower household income. However, previous research has mainly focused on households or parents as the unit of interest, even when studying children and their living environment. In this study, we construct a child population of the households and focus on children's economic circumstances. We argue that this approach will produce more accurate estimates if one is interested in children's economic circumstances since the traditional approach most likely underestimates the share of children living in, for example, low-income and single-headed households.

We consider the differences in economic circumstances based on parental education and household structure. With parental higher education, we refer to families where at least one adult has completed a tertiary-level degree. Regarding household structure, we consider factors contributing to economic circumstances presented in previous studies, namely whether the child is living with one or two adults, the number of children in the household, and the timing of parenthood. All of these factors are expected to vary across educational groups and countries and have important implications for parents' income, as described in the previous chapter.

As countries differ substantially in demographic processes and returns to education, we compare 11 European countries in this study. Due to the increasing interest in differences across regional variation, we extend our analysis to smaller territorial units whenever possible.



2.2. Data and sample

To study these questions, we used the first wave of the first round of cross-nationally comparable Generations and Gender Survey (GGS-I), which was collected in 19 countries between the years 2002 and 2013. The survey has responses from around 200,000 adults from ages 18 to 79, including questions on, for example, family and family formation, households, relationships, and work life. It is designed as panel data, and in this study, we use wave 1 of the first round of the survey (GGS-I). A detailed description of the data can be found in Gauthier et al. (2018).

Out of the 19 countries of the survey, our sample includes 11 of them representing both Eastern and Western Europe (though with a notable lack of representation from Southern Europe): Bulgaria, Russia, Georgia, France, the Netherlands, Romania, Norway, Belgium, Lithuania, Poland and the Czech Republic. Eight countries (Australia, Austria, Estonia, Germany, Hungary, Italy, Japan and Sweden) were dropped due to inadequate income information, such as income reported only in bands. In sum, 126,417 respondents from the countries are included (Table 1). In this study, we apply the child perspective; thus, our analysis unit is the child (for a similar approach, see e.g. Kennedy and Thomson, 2010; Kalmijn and Leopold, 2021). Even though only adults have responded to the survey, GGS has a household roster covering basic information of all household members. We built the child perspective by multiplying each respondent by the number of children under the age of 18 living in the household. This approach includes all children living in the household but does not separate the relationship between the respondent and the child, thus focusing more on the economic circumstances in the household rather than on the biological link between children and adults. There are altogether 65,395 children living in these households across 11 countries, 59,953 of which are represented in the final sample. We dropped 8% of children (N=5442) due to missing information, almost all due to missing information in (parental) income. There was substantial variation between the countries in missing income, ranging from 1% in Norway and 2% in France to 27% in the Netherlands. Table 1 presents the number of respondents, the number of children (under the age of 18) of these respondents living with them and, lastly, the number of children left in our final sample after dropping the observations with missing data. Additionally, Table 1 displays the number of regions in these 11 European countries. The definition of region varies across countries and is not based on the same NUTS level in each country. In our sample, the number of children at the regional level varies from 6 at the minimum to 2027 at the maximum, with a mean of 382.



Table 1. Sample statistics across 11 countries

	N (Regions)	N (Respondents)	N (Child perspective)	N (Our sample)
Belgium	3	7163	3903	3655
Bulgaria	28	12 858	6985	6568
Czech Republic	8	10 006	3889	3414
France	22	10 079	5787	5662
Georgia	11	10 000	5864	4760
Lithuania	10	10 036	4364	3673
Netherlands	12	8161	4963	3623
Norway	7	14 880	9809	9672
Poland	16	19 987	9082	8570
Romania	8	11 986	5560	5328
Russia	32	11 261	5189	5010
Total	157	126 417	65 395	59 935

2.1. Variables

As we are interested in educational group differences in economic circumstances, our dependent variable is the country-specific income rank based on equivalence-scaled household income. This income variable is constructed by summing all income types from the respondent and the respondent's possible co-residential partner together. Respondents were asked about different income types and how often they received these during the last 12 months as well as their net amount.¹ We multiplied the net amount received by the frequency of these payments during the last 12 months to get the annual net income, including all income types ranging from earnings to unemployment benefits, among others.² If respondents did not provide an exact number for payment, they were asked which income range or band it would fall. In these cases, we replaced missing income information with the information received from these income bands. We calculated the median income for each band in each country (using information from those who did provide the exact number) and used that for the replacement. These steps were also applied to the respondent's possible partner to calculate their annual net income. We then summed the respondents' and partners' incomes to get the annual net household income. This household income was further equivalence scaled by dividing the household income by the square root of the number of people living in the household, which thus represents the individual share of family income. Further, this equivalence-scaled household income was converted into country-specific percentiles ranging from 0 to 100 in each country in order to take into account the variation between countries in average income levels and better capture inequalities within countries.

Our main independent variable is a binary variable for whether either of the adults in the household (respondent or the partner) have obtained a higher education degree (ISCED 5 or more) or not. In the text, we occasionally refer to this as parental education for the sake of text fluency, but it should be noted that the respondent or the partner are not necessarily the child's (biological) parents. Our other key independent variables include whether the

1. For Norway, all the income information comes from administrative registers linked to the survey data. As an additional exception, Norway has information on gross income.

2. Poland and Norway reported summed annual income for respondents and partners.

respondent is living with a partner, the number of children in the household and the age of the respondent when their first child was born. The first one of these is a binary variable measuring whether the child is living with one or two adults in the household. The number of children in the household is a continuous variable ranging from 1 to 11 (overall unweighted mean 2.2 and standard deviation 1.1). The age when the first child was born is also a continuous variable ranging from 13 to 58 (overall unweighted mean 25.6 and standard deviation 5.1), and it is centred on its overall mean for the analyses. For 2 % of the respondents, the age of the respondent when their first child was born is missing as this variable refers only to biological or adopted children. In the models we replaced missing values with country-specific means and added a dummy variable indicating missingness. In addition to these variables, we control for the sex of the respondent and the age of the respondent in the models (centred on its overall mean for the analyses).

2.2. Analytical steps and methods

We start by displaying the share of highly educated households across countries, after which we continue with descriptive analyses. We present the raw education group income gap and study the relationships between (parental) education and household structure factors. We analyse weighted data throughout the study to correct for a biased non-response.

We study mean outcome differences between the groups using the Blinder-Oaxaca decomposition technique (Blinder, 1973; Oaxaca, 1973). With this technique, we can show how much household structure factors explain the gap in economic circumstances between children living in higher and lower-educated households, displaying a counterfactual situation of what the income gap would be if all education groups had the same household structure. Doing this, we apply two-fold decompositions and thus divide the outcome difference into two parts: an unexplained and an explained part. We present our results from pooled regressions using the coefficients from both groups as the reference coefficients (Jann, 2008 p. 465) and include a group indicator, parental education in our case, as an additional control variable as suggested by Jann (2008, p. 458). In this study, we are interested in the explained part of the decomposition and its size across countries and regions. In other words, we study how much the education group income gap is explained by household structure.

In addition to figures displaying the income gap based on the income percentile, we calculate mean differences and decompositions in each country using absolute income measures. This approach is adopted to help understand how differences in income rank between education groups correspond to differences in absolute income. For example, in countries where education group differences in income rank percentile are large, absolute differences in income may still be relatively small, especially if the country's income level is low. However, as the income level varies substantially between the countries, we present these results in relation to the country-specific median income based on our sample.

To study regional variation, we ran three-level random-intercept-random-slope (RIRS) models clustering children into regions and countries.³ We added a random slope for education, and thus, we can present the variance of the importance of education for the income rank position across countries and regions. We ran two nested models to be able to compare whether adding household structure variables to the model explains more of the variance at the country or at the regional level. We also apply Blinder-Oaxaca decomposition across different regions in four countries in which information on regions corresponds to the most detailed level of NUTS classification (NUTS3). This allows for the comparison of territorial units that are similar in size.

3. Results

3.1. Descriptive results

Table 2 presents the proportion of highly educated households by country. It should be kept in mind that all of the results are presented from the child's perspective, which is why, for example, these proportions refer to children who are living in higher or lower-educated households instead of the overall country mean of highly-educated households. As can be seen from the table, countries differ substantially in the share of highly educated parents. In Romania, only 11% of children are living in highly educated households, whereas in Belgium, more than half of the children are living with a highly educated parent. On average, across these 11 European countries, 36 % of children (weights applied) are living with at least one highly educated parent, Eastern European countries having lower educated parents (Bulgaria, Romania, Lithuania, Poland, Czech Republic) compared to Western European countries (France, Netherlands, Norway, Belgium). Exceptions of this are Russia, with 53 %, and Georgia, with 43 % of highly educated parents in the data. Thus, it is worth noting that highly educated households are not the socioeconomic elite as in some countries, more than half of the children belong to this part of the population.

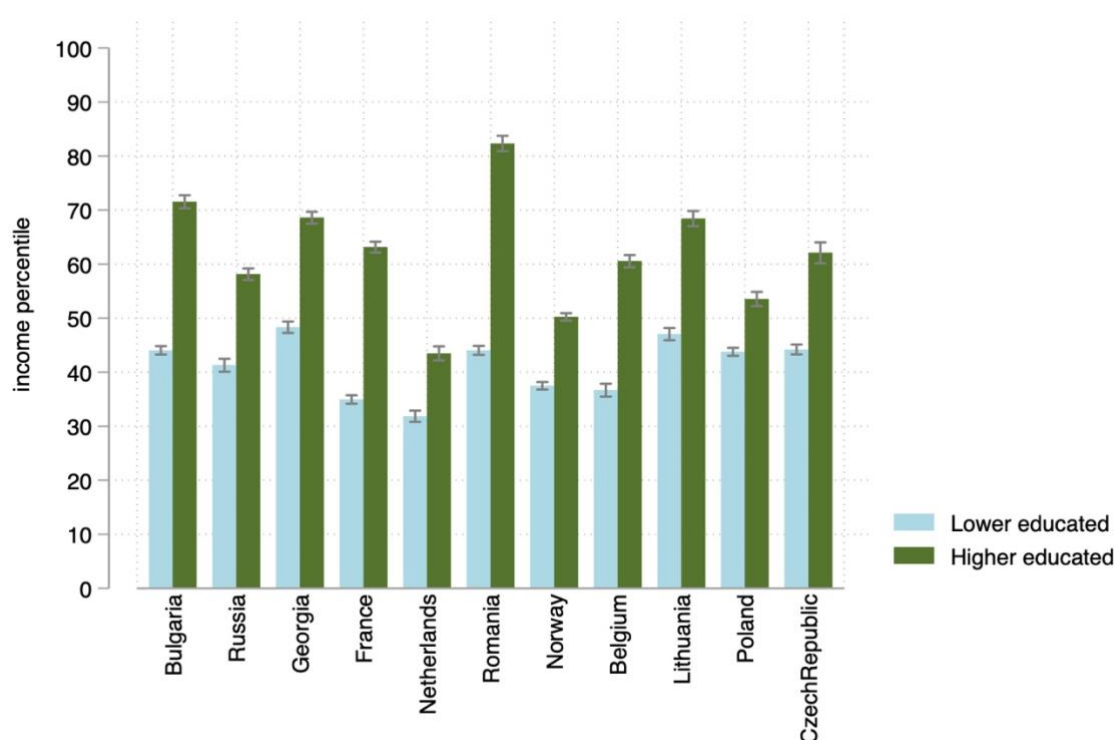
Table 2. The weighted share of highly educated households (child perspective) by country (N=59 953)

	Highly educated parents
Bulgaria	24.8
Russia	52.8
Georgia	43.3
France	40.9
Netherlands	46.7
Romania	10.9
Norway	48.0
Belgium	56.2
Lithuania	32.4
Poland	31.3
Czech Republic	19.0
Total	36.4

³ It should be noted that in these multilevel models, region is based on the variable provided by GGS and not based on (similar) NUTS classification in each country. Further, linear multi-level models assume normally distributed errors, which implies that the dependent variable is conditionally normal, whereas our dependent variable, income rank, follows a uniform distribution, which may bias results. However, the literature suggests this bias to be substantive only with small cluster sizes (e.g., Rabe-Hesketh and Skrondahl, 2006).

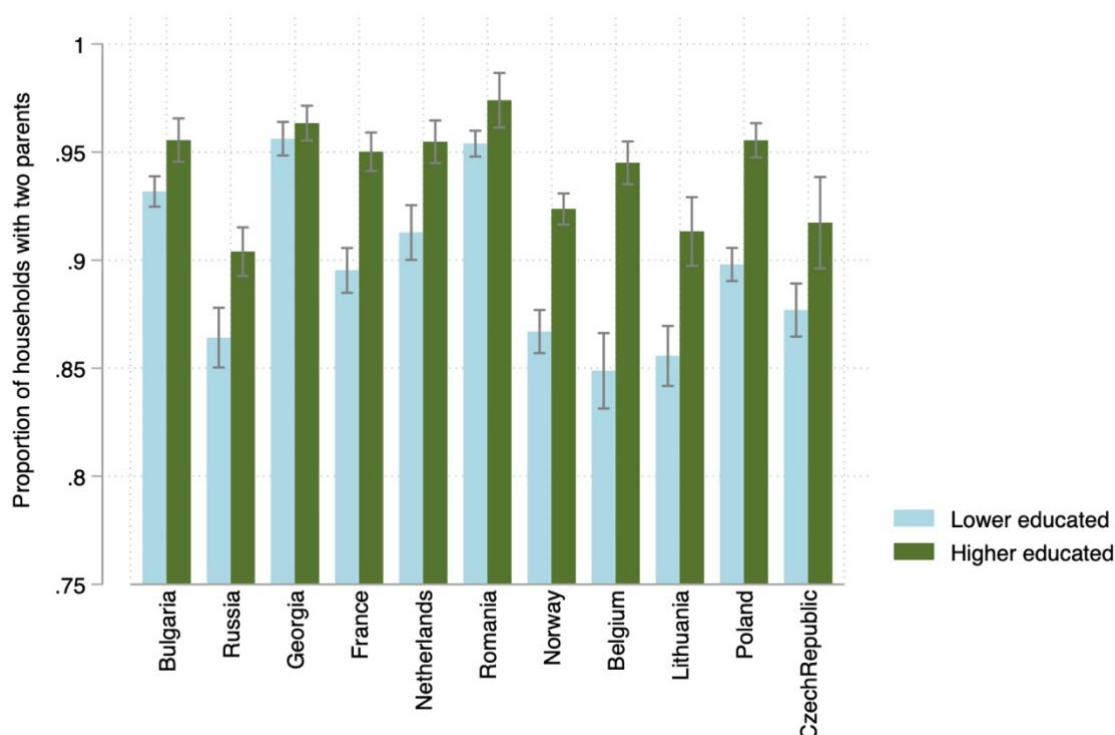
Figure 1 shows the raw parental education gap in children's economic circumstances as measured in within-country income percentiles. As can be expected, children of higher-educated parents live in families with higher equivalized household incomes compared to children of lower-educated parents. This gap varies from around 10 to 38 percentage points and is substantially larger in Romania compared to other countries, in which the proportion of highly educated was significantly lower than in other countries (see Table 2). In the following steps, we aim to study whether this gap in economic circumstances between children living in higher- and lower-educated families is only due to differences in returns to education or can be explained by differences in household structure among educational groups.

Figure 1. Weighted mean of country-specific income percentile (based on equivalence scaled household income) in lower and higher educated families by country (N=59 935) with 95% confidence intervals. Child perspective.



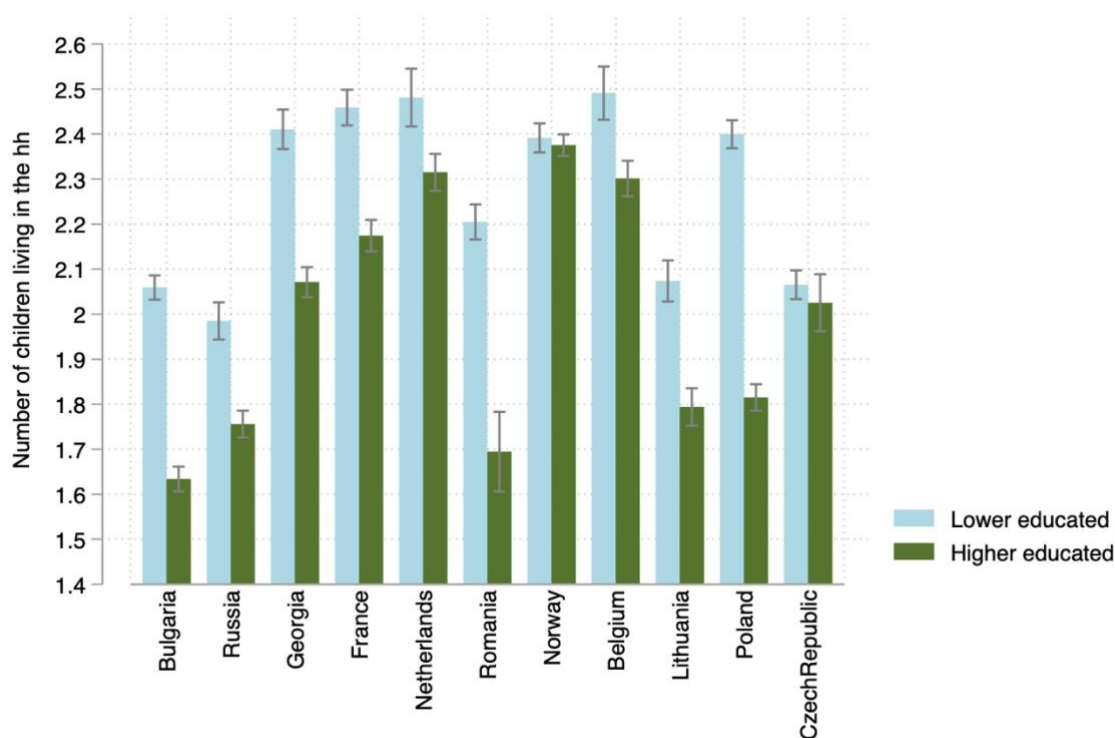
Next, we present descriptive results showing how household structures differ for children living in higher and lower-educated families across countries. As shown in Figure 2, the majority of children live with two parents or adults in the household, but children living in higher-educated households have two adults in the household more often than children living in lower-educated households. This educational group difference is the largest in Belgium (10 percentage points) and the smallest in Georgia (1 percentage point).

Figure 2. The weighted share of children living in households with two adults in lower and higher educated families by country (N=59 953) with 95% confidence intervals. Child perspective.



In addition to the educational group differences in the share of two-adult households, children living in higher and lower educated households differ also in the number of siblings they have living with them (results based on all children of the respondent/parent shown in the Appendix, Figure A1). Figure 3 presents the mean number of children living in the household across parental education groups and countries. The figure shows that children living with lower educated parents have more siblings in each country (as an exception, there is no educational group difference in Norway). This difference in the number of children living in the household (in households with children as we apply the child perspective) varies from zero in Norway to 0.6 in Poland.

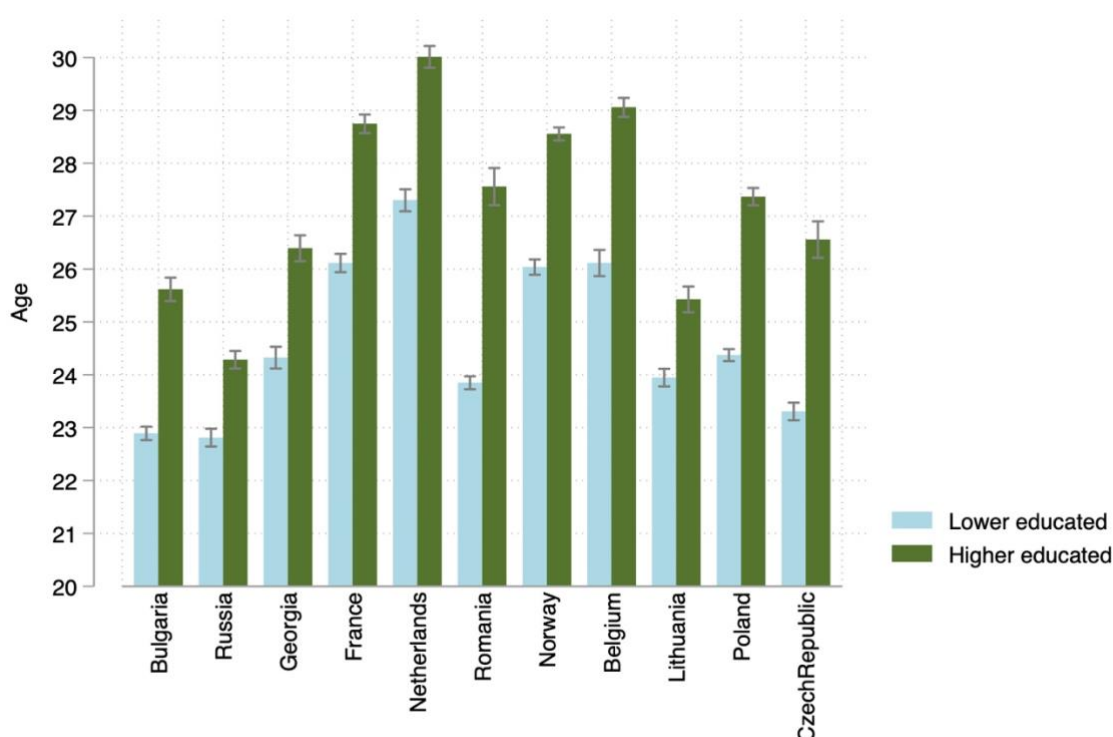
Figure 3. Average number of children living in the household in lower and higher educated families by country, weighted mean (N=59 953) with 95% confidence intervals. Child perspective.



Note: Norway's data points for lower and higher education overlap.

In addition to children with higher educated parents having fewer siblings on average, their parents have also entered parenthood older. Figure 4 displays the educational group difference in the parents' age when they entered parenthood. This average age varies from 22.8 years among lower-educated parents from Russia to 30.0 years among higher-educated parents in the Netherlands. In each country, higher-educated parents entered parenthood at an older age compared to lower-educated parents. This difference is smallest in Russia and Lithuania (1.5 years) and largest in Romania (3.8).

Figure 4. Average age of the parent when the first child was born in lower- and higher-educated families by country, weighted mean (N=58 707) with 95% confidence intervals. Child perspective.



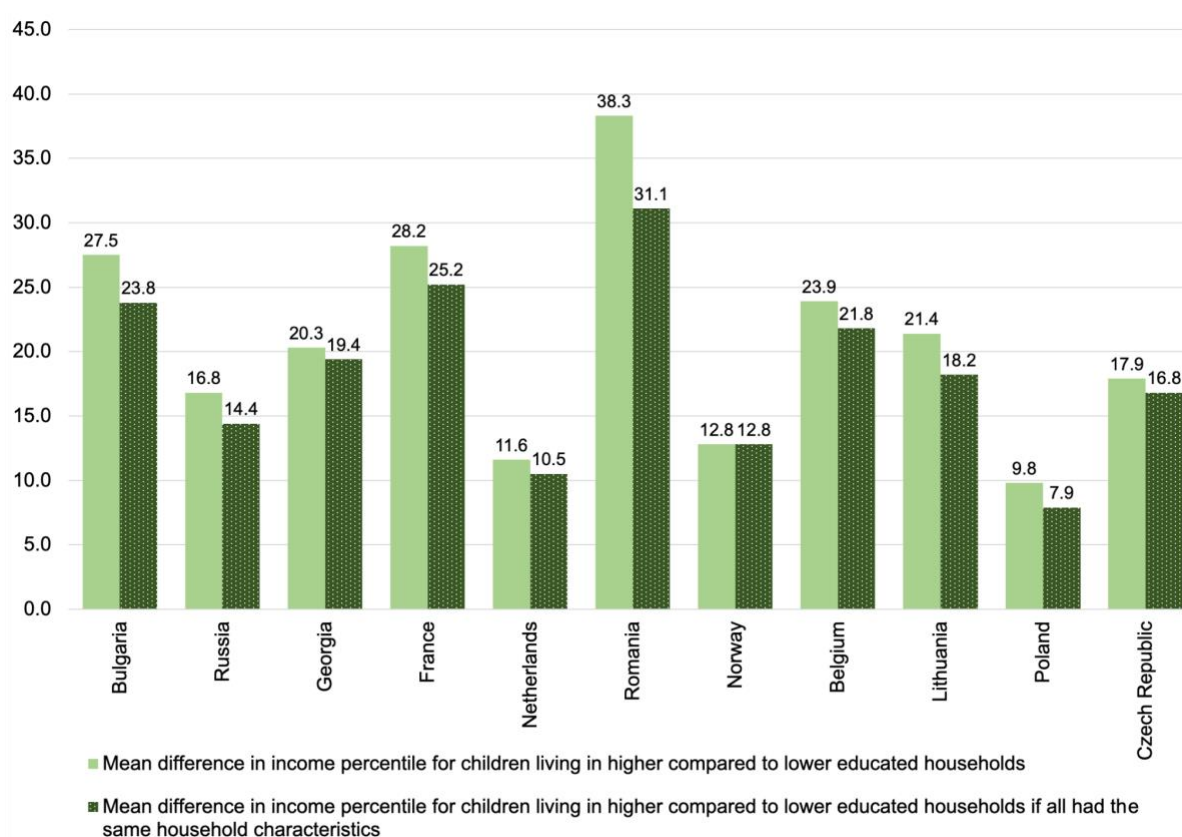
3.2. Multi-level and decomposition results

As previously stated, we ran multi-level models clustering children into regions and countries to study the variance of the importance of education for the income rank position across countries and regions. The variance for the education slopes at the country level was in the first model 59.4, including only education and control variables, and was decreased to 54.4 when adding household structure factors to the model (results shown in the Appendix, Table A1). Across regions, the variance for the slope of education was 14.3 in the first model and reduced to 13.3 when including the household structure variables. Altogether, the variance for the slope of education seems to be larger at the country-level than at the regional level. In other words, countries differ more from each other when we estimate how much educational level contributes to the income rank position than do regions within countries from each other. In relative terms, adding household structure variables to the model decreases the variance of the education slope at the country and regional levels in very similar terms: 8% in the former and 7% in the latter.

Next, we turn to decomposition results. In Figure 5, the left-side bars in light green represent the income percentile gap by education groups (mean difference), whereas the right-side bars in dark green represent the income percentile gap by education groups if all had the same household structure. The latter is calculated by subtracting the explained part of the decomposition from the mean difference. As seen in Figure 5, countries differ quite substantially in how much household factors explain the mean difference. In

absolute terms, household structure explains the mean difference the most in Romania (7 percentage points). Children with higher-educated parents end up, on average, 38.3 percentage points higher in the income percentile rank compared to those with lower-educated parents. This is not only due to differences in returns to education, as this advantage for living in a higher educated household is 31.1 percentage points using the hypothetical situation in which all households would have the same household characteristics. In relative terms, the largest part of the difference is explained by household factors in Romania and Poland (19 %). In Norway, household structure factors do not explain the education group income gap at all.

Figure 5. *Blinder-Oaxaca pooled two-fold decomposition of outcome differentials (N=59 935). All models control for respondent's sex and age. Child perspective.*



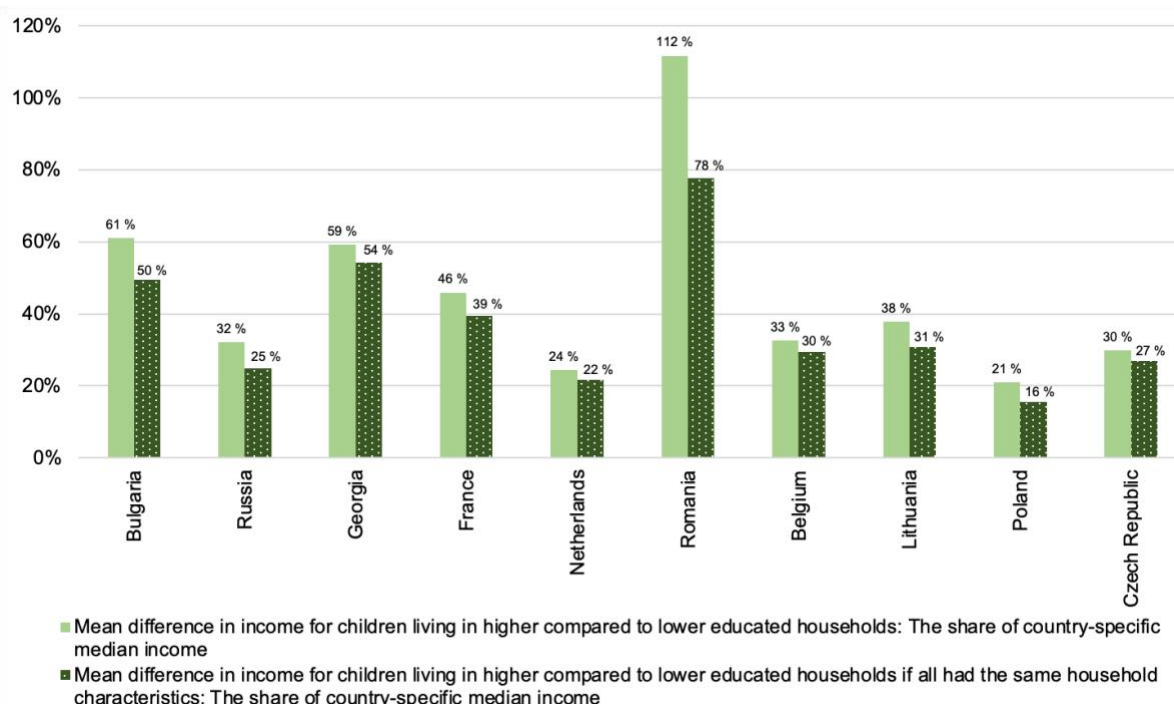
Note: Weights applied. No confidence intervals around the estimates.

In Figure 6, the left-side bars in light green represent how much the income gap by education groups measured by equivalence-scaled annual net income is compared to the country-specific equivalence-scaled annual net median income.⁴ The right-side bars in dark green represent how much the income gap by education groups measured by equivalence-scaled annual net income would be compared to the country-specific equivalence-scaled annual net median income if all had the same household structure. For example, in Romania, the mean difference in equivalence-scaled annual net income

4. The baseline for calculating mean differences in absolute terms (euros): the weighted country-specific average income percentile of lower educated.

for children living in higher compared to lower educated households was, on average, 1237 euros (these numbers are not shown in the figure), which corresponds to 112 % of the equivalence scaled household annual net median income of this population and is reduced to 78 % after assuming all had the same household structure. Altogether these results tell a rather similar story as above. The largest differences are shown in Romania and smallest in Poland and the Netherlands.

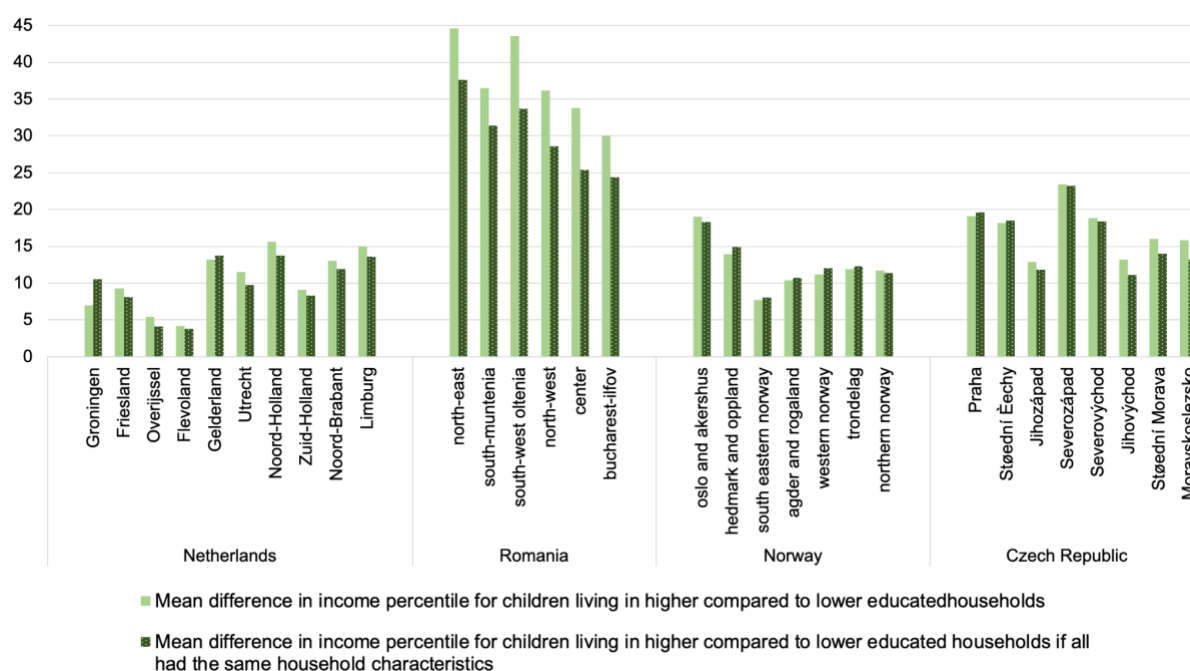
Figure 6. *Blinder-Oaxaca pooled two-fold decomposition of outcome differentials (N=59 935). All models control for respondent's sex and age. Child perspective.*



Note: Norway was dropped from the analysis due to information only on gross income. Weights applied. No confidence intervals around the estimates.

Lastly, to observe differences within countries, we apply the decomposition analysis in the four countries that reported NUTS 3 -level regional information in the data: Netherlands, Romania, Norway and Czech Republic, and present the same decomposition results for these regions. In Figure 7, the left-side bars in light green represent income rank gaps by education groups and the right-side bars in dark green represent the income percentile gap by education groups if all had the same household structure. As shown in Figure 7, there is some regional variation in both the mean difference and the explained part. In some regions in Norway, the Netherlands and the Czech Republic, the mean difference across educational groups would be even larger if these educational groups had the same household structure. These are countries that had rather small explained parts on average to begin with. A note of caution is due here since, in some regions, the results are based on only a few dozen respondents. Overall, though, despite the regional differences in the income gap, the way in which household structure explains the gap seems to differ relatively little within countries.

Figure 7. Blinder-Oaxaca pooled two-fold decomposition of outcome differentials (N=59 935). All models control for respondent's sex and age. Child perspective.



Note: Two regions in the Netherlands (Drenthe and Zeeland) and in Romania (south-east and west) were dropped from the analysis due to too low number of observations to be able to run the models. Weights applied. No confidence intervals around the estimates.

4. Conclusions

Prior studies have noted the importance of family structure on children's diverging economic circumstances. Studies have also shown that family or household structures vary across educational groups. We explored how much these differences in household structures can explain the diverging economic circumstances between children living in higher and lower-educated households. Secondly, we studied how this varies across and within European countries. We applied the cross-nationally comparable Generations and Gender Survey (GGS-I) comparing 11 European countries to study these questions. Our unit of analysis is a child, as the main focus is on the economic circumstances of children living in higher and lower-educated households.

The results of this study show that there are substantial differences in the proportions of children living in highly educated households across countries. On average, around a third of children had at least one highly educated adult living in the same household with them. There is a rather strong educational gradient in the household structure, as has been found in previous studies. Children with highly educated parents are more often living in two-parent households, have fewer siblings living in the household, and have their parents enter parenthood at an older age.

In each country studied, children living with highly educated parents also live in better economic circumstances compared to others. This educational gap in equivalence-scaled household income varies quite substantially between countries, being the smallest in

Poland, Netherlands and Norway and the largest in Romania. Our decomposition results based on Blinder-Oaxaca decomposition show that part of the better economic circumstances of children living in highly educated households is due to differences in their household structure. Thus, the better economic circumstances of children in highly educated households are not only due to differences in parents' returns to education. Even though we found some variation across countries and regions in how much the household structure explains differences between education groups, the general pattern was found to be rather similar.

Overall, these results indicate that the economic circumstances of children around Europe largely depend on parents' educational degrees but also on the heterogeneous prevalence of single-headed households and the number of children across these education groups. The importance of education on children's economic circumstances was found to be more similar within countries than across countries. An important limitation of our selection of European countries is the absence of Southern Europe, which is why our results are not representative of the whole of Europe. Moreover, our main independent variable – whether households had at least one university-educated parent – encompasses various different household structures the prevalence of which are likely to differ across countries. While our models accounted for the number of adults and children in the household, future studies could include measures of the educational pairing of parents in the analysis to produce a more nuanced picture. Another important limitation in our case was the small number of observations and the comparability at the regional level. Increasing the availability of regional data will, however, open more possibilities for studying the importance of the local environment in detail.



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Appendix

Figure A1. Number of all children for lower and higher educated respondents by country, weighted mean (N=126 417) with 95% confidence intervals.

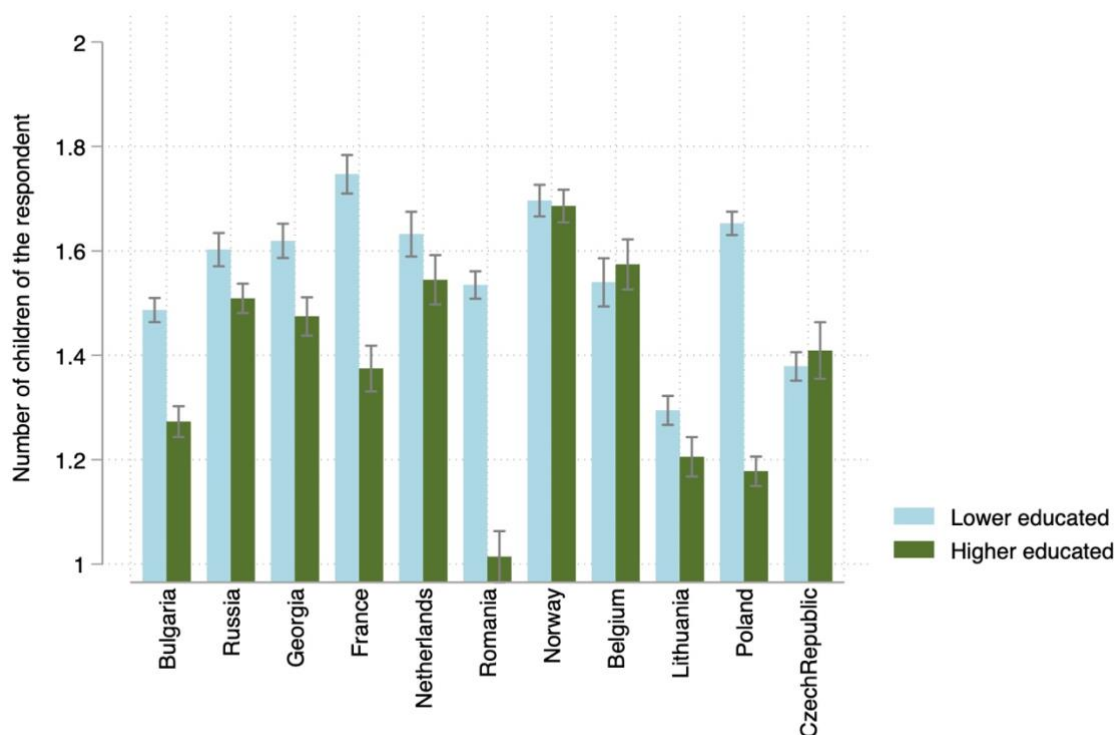


Table A1. Three-level random-intercept-random-slope model. Children nested in countries ($N= 11$) and regions ($N= 157$). Child perspective ($N= 59\,935$).

	Model 1			Model 2		
	Estimate	[95 % confidence interval]		Estimate	[95 % confidence interval]	
Education of the respondent (ref. No higher education degree)	18.9	14.0	23.8	16.9	13.0	20.8
Sex of the respondent (ref. Male)	-7.4	-12.9	-1.8	-6.1	-12.7	0.5
Age of the respondent (centered to its mean)	0.1	0.0	0.2	0.3	0.2	0.4
Number of children in the hh				-5.6	-6.9	-4.2
Two adults in the hh (ref. No)				8.7	-0.2	17.6
Age when the first child born (centered to its mean)				-0.2	-0.2	0.1
Age when the first child born missing (ref. No)				-1.3	-3.6	1.1
Intercept	45.4	42.4	48.3	49.4	40.0	58.9
Country-level variance						
Slope (education)	59.4	27.5	128.6	54.4	24.8	119
Intercept	25.0	10.1	61.5	20.4	7.2	57.1
Region-level variance						
Slope (education)	14.3	8.1	25.2	13.3	7.5	23.6
Intercept	69.1	25.4	188.1	63.5	22.8	176.5
Residual variance	675.7	573.8	795.8	640.3	533.6	768.4