

**„Dunărea de Jos” University of Galați**  
**Doctoral School of Social Sciences and Humanities**  
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# **DOCTORAL THESIS ABSTRACT**

## **Three Dimensions of Inequality of Opportunity**

**PhD Student: Arabela Ichim**

**President Professor Adrian MICU, PhD**  
„Dunărea de Jos” University of Galați, Romania

**PhD Professor Daniela Ancuța ȘARPE, PhD**  
**Coordinator** „Dunărea de Jos” University of Galați, Romania

**Official referents Professor Ion POPA, PhD**  
The Bucharest University of Economic Studies, Bucharest, Romania  
**Professor Joost Juriaan DE LAAT, PhD**  
Utrecht University, Utrecht, Netherlands  
**Professor Mihaela Neculiță, PhD**  
„Dunărea de Jos” University of Galați, Romania

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## Abstract

**Keywords:** Inequality of Opportunity; Roma in Europe; Entrepreneurial Outcomes; Achievement; Attribution of Effort; Socio-Economic Background; Tertiary Education Outcomes.

*This dissertation expands the equality of opportunity literature in three ways. First, it investigates whether the same patterns of disadvantage and advantage that explain the inequality in common life outcomes, such as education, employment, and income, also hold for entrepreneurial outcomes for a sample of Roma from North Macedonia, and Serbia. The results indicate that there is a positive effect of parental education on education attainment, employment, income but also on becoming an entrepreneur and succeeding at it. There is no support for the hypothesis of a negative effect of parental education on becoming an entrepreneur. The hypothesis of a positive effect of parental education on entrepreneurial success holds. Second, on the same sample, the influence of socio-economic background on how individuals attribute their achievement to own efforts was investigated. The findings indicate that, consistent with the evidence for self-serving bias, achievement has a positive effect on attribution to effort. Moreover, parental education has a positive moderating effect. It is notable that, compared with low achievement and low parental education, individuals with the same low level of achievement but higher parental education, attribute their achievement to effort to a larger extent. Lastly, this dissertation contributes to the evidence about the persistence of inequality of opportunity in tertiary education by analyzing the effect of socio-economic background on intermediary educational outcomes in a sample of university students in the Netherlands. Contrary to the hypotheses, the findings indicate a negative effect of parental education and a positive effect of low parental income on intermediary GPA.*

## Introduction

This dissertation presents the results of three studies, each exploring a distinct dimension of inequality of opportunity, and it aims to deliver the following contributions: First, it explores whether adverse life circumstances can have a silver lining. Another dimension is explored by investigating the eventual inequality of perception of one's outcomes. Lastly, a further negative aspect is considered by exploring the persistence of inequality.

Over the last two decades, there have been significant contributions in terms of inequality of opportunity measurements for a variety of outcomes, such as income, education, and even health and life expectancy (Björklund et al.,2012; Chevalier et al., 2010; Bricard et al., 2020). Additionally, there are also studies that have applied the ex-post non-parametric approach, which entails estimating the level of inequality of opportunity by looking at the difference in outcome between individuals with similar levels of effort across types (Betts & Roemer,1999; Page & Roemer, 2001; Björklund et al., 2012).

Within the Equality of Opportunity Literature (EoP) literature, there is a focus on the disadvantage stemming from circumstances beyond one's control (Hufe et al.,2017). There are arguments from other fields highlighting how adversity, including poverty, can have positive effects on later life outcomes, such as increased resilience (Masten, 2001). In the first study, this dissertation expands the field of EoP by investigating whether the same patterns of disadvantage and advantage that explain the inequality in common life outcomes, such as education, employment, and income, hold for entrepreneurial outcomes as well for a sample of Roma communities from North Macedonia and Serbia. Based on the findings, conclusions are drawn regarding an unseen benefit to having unfavorable life circumstances.

Moreover, as highlighted above, the EoP literature offers a valuable contribution to the measurement of inequality of opportunity, by making salient the share of inequality that is explained by circumstances beyond one's control (Roemer,1998). In addition, the role of luck in individual achievement is also highlighted (Arneson,1989; Cohen,1989; Rawls,1971). However, the literature linking measurements of inequality of opportunity with how individuals reflect on their outcomes is under-researched. There are studies from sociology and psychology that indicate how high achievers attribute their success to internal factors, and low achievers attribute their outcomes to external factors (Mezulis et al., 2004; Synder et al, 1976; Wen, 2018). This dissertation builds on this evidence and links it with the equality of opportunity literature. The second study investigates the influence of socio-economic background on how individuals attribute their achievements to their own efforts on the same Roma sample.

Furthermore, public mandatory schooling is supposed to be the great equalizer (Downey et al.,2004). So, evidence of inequality of opportunity in academic performance at the university level can be interpreted as persistence. There are some relevant studies about inequality of opportunity in terms of access, and there is also evidence of inequality of opportunity in terms of graduation grades and earnings (Palmisano et al., 2020; Peragine & Serlenga,2008). This dissertation aims to contribute to the evidence about the persistence of inequality of opportunity in tertiary education. The third study investigates the effect of socio-economic background on intermediary educational outcomes in a sample of university students in the Netherlands, a country with relatively high investments in both pre mandatory and tertiary education (OECD, 2021).

To sum up, this dissertation is structured as follows: The first chapter contains a literature review of inequality of opportunity and concludes with the main gaps and how these will be addressed. Then, the second chapter explores the first dimension, which entails an analysis of parental education's effect on education, employment, and income but also on entrepreneurial outcomes, distinguishing between becoming an entrepreneur and succeeding in entrepreneurship. In the third chapter, the dimension of inequality of opportunity is explored by analyzing the effect of socio-economic background on the relationship between achievement and attribution to effort. Further, Chapter 4 considers a dimension linked to persistence. It entails a study on the effect of socio-economic background on short-term educational outcomes on a sample of students at a university in the Netherlands. Finally, the overall conclusions of the dissertation are presented in Chapter 5.

## Chapter 1. Equality of Opportunity, Theoretical Underpinning, Evidence and Main Gaps

### 1.1. Principle

The Equality of Opportunity (EoP) literature relies on the work of John Rawls (1971) regarding social contract theory. He argues that equal distribution of resources is a preferable alternative to utilitarian philosophy. Moreover, every individual has an equal right to basic freedoms and should have the right to opportunities and the same chance as other individuals with similar levels of ability.

In his book, "Theory of Justice" (1971), he addresses social justice and enunciates the concept of "Justice as Fairness". This consists of two principles. The first one states that *"Each person has the same and inalienable claim to a fully adequate scheme of equal basic liberties, which scheme is compatible with the same scheme of liberties for all"*. The second principle states that *"Social and economic inequalities are to satisfy two conditions: first, they are to be attached to offices and positions open to all under conditions of fair equality of opportunity; and second, they are to be to the greatest benefit of the least advantaged members of society (The Difference Principle)"*.

The second principle addresses equality in particular. Inequalities in any society are unavoidable, as they arise from inherited traits, social class, motivation, drive, and luck. Rawls makes the argument that a just society would reduce inequalities in areas where there is scope for action. Jobs should be accessible to everyone by eliminating discrimination and providing everyone access to education. He argues that each individual should have a fair chance to attain

such a position when her/his odds of success are given by ability and exerted effort and not by social class or background.

Besides the significant contribution of Rawls' "Theory of Justice" to the equality of opportunity field, there are other political philosophers, social theorists, and economists who extend Rawls' work. For example, Sen (1980) brings forward an enhancing capability approach by highlighting the fact that focusing only on material resources is not enough and it is important to improve people's capabilities. He explains that the goal of equality of opportunity is fulfilled only when individuals have the ability to pursue their life goals and lead a dignified life. Nussbaum (1987) further adds to Sen's capability approach and specifies the capabilities that are necessary for individuals to lead a dignified/fulfilled life. She highlights education, healthcare, and political participation as being key to ensuring equality of opportunity. Dworkin (1981) brought forward the idea of "equality of resources" and individuals. This states that individuals should be given access to resources to create a life in line with their own preferences and values. Thus, his proposed form of equality included individual autonomy.

"The Theory of Justice" was also criticized, most notably regarding the "difference principle." In contrast to Rawls (1971), who to some extent defended the idea of redistributing wealth and resources from the more advantaged members of society to the less advantaged, Nozick (1974) opposes forced redistribution of wealth, which he views as a form of coercion and a violation of individual rights.

Overall, the authors mentioned above addressed the issue of justice in society but reached different conclusions, specifically when it comes to redistribution. Examples from both sides of the spectrum have been presented, Rawls, Sen, and Nussbaum on the one hand, and Nozick (1974) on the other. Their ideas continue to be discussed and debated in both political philosophy and public discourse. However, it is notable that Rawls has been shown to be very influential, as most countries in the developed world do address the issue of justice and equal opportunity in society by applying at least some form of redistributive policies (Kuypers et al., 2021).

## 1.2. Notable Contributions

Ever since Roemer made an important contribution with the methodology enabling quantifying the level of inequality explained by circumstances, which is considered "unfair", there have been major contributions to the evidence about inequality of opportunity. The additions and advancements mentioned below have strengthened the analytical tools and policy relevance of EoP research, making it essential in the discourse on inequality and social justice.

Björklund et al. (2012) also use the parametric approach, which implies dividing the sample into multiple types based on shared circumstances. The study, which made use of a large sample in Sweden, investigated the impact of inequality of opportunity on income. They added IQ



and Body Mass Index (BMI) to the list of circumstances and divided the sample into 1152 types. The findings show that the strongest predictor of income is IQ, but parental background remains important. However, the results indicate that 90% of income inequality in Sweden is determined by effort. These results build on previous research (Björklund and Jäntti (1997) which concludes that parental background has a weaker effect on children's income in North European countries in comparison with the UK and the USA.

On the other hand, Checchi and Peragine (2010) applied a non-parametric approach for estimating the inequality of opportunity in terms of income. This method entails eliminating first the inequalities within types by estimating mean values (ex-ante) and then measuring inequality across types at the same percentile in the income distribution. The circumstances included in the study are parental education, region of birth, and gender and the findings indicate that the highest level of inequality is in women in Southern Italy.

Alternatively, Bourguignon et al. (2007) and Ferreira & Gignoux (2011) make a distinction between effort and circumstances by estimating a linear model of income as a function of circumstances and efforts. This estimation method implies splitting total income inequality into circumstances and a residual term. The results explain the total inequality explained by circumstances but also the contribution of each circumstance specifically. The study by Bourguignon et al. (2007) applies this method to a sample from Brazil and finds that the five circumstances included in their model (father and mother's education level, father's occupation, race, and region of birth) explain 25 percent of total income inequality. Interestingly, this finding suggests that parental background is the strongest predictor of income.

### 1.3. Main Gaps

A significant addition to the literature is estimating the degree of effort of a specific subgroup within a type or even a specific individual in a sample by applying a non-parametric ex-post approach. This brings up the issue of responsibility for outcomes. So, it might be that the evidence produced by the EoP scholars can be used as an explanation for poor outcomes for those who exert little effort.

There is an extensive list of circumstances, including socio-economic background, child-parent relationship, health-related behavior, and ability that impact outcomes (Hufe et al., 2017). However, data availability remains a challenge. In addition, applying the non-parametric ex-post measure, which estimates effort, requires an exceedingly high number of observations, so it remains inapplicable, especially if the list of circumstances in the model is long (Brunori, 2016). Thus, the main limitation of the field is that, measuring the real level of inequality is not really feasible. The best conclusion scenario is that there is an estimation based on the observed circumstances for which data is available. Even if the results cannot be interpreted as the actual

level of unfair inequality, these are a lower bound of unfair inequality in a given sample, so the interpretation of results is still valuable for policy implications. Although it cannot give an exact measurement of inequality, it can robustly conclude that inequality measured by the given list of circumstances is at least what the analysis indicates. Hence, despite the limitations mentioned above, the value of evidence stemming from the EoP literature is straightforward.

#### 1.4. Gaps Addressed in this Dissertation

A remaining challenge consists of disregarding groups of people who are at a disadvantage in countries with relatively low levels of inequality, estimated on available data. For example, in Europe, the Roma people are at a disadvantage compared to the general population, but there are major data availability limitations (FRA,2022). This study aims to contribute to addressing this gap by investigating the patterns of transmission of advantage and disadvantage in a sample of Roma communities in North Macedonia and Serbia. These patterns might differ for members of this community as they face discrimination in different areas of life, education, employment, and housing (FRA,2022). The analysis entails estimating the causal effect of parental education on common life outcomes, education, employment, and income.

Moreover, there is an extensive list of outcomes covered in the literature about equality of opportunity. However, the focus remains on how circumstances beyond one's control that put you at a disadvantage, such as low parental education negatively impact later life outcomes. This dissertation contributes to filling this gap by analyzing whether the same patterns of transmission of advantage and disadvantage through parental education hold for entrepreneurial outcomes in a sample that is disadvantaged, such as the Roma communities in North Macedonia and Serbia. The analysis entails estimating the effect of parental education on entrepreneurial outcomes, distinguishing between becoming an entrepreneur and succeeding at entrepreneurship.

Another gap in terms of outcomes consists of inequality of opportunity estimates for tertiary education (Palmisano et al., 2020). There are studies that measure the inequality of opportunity in terms of access ((Brunori et al., 2012). There is also evidence regarding the inequality of opportunity in tertiary education in terms of long-term outcomes, such as graduation grades and earnings (Peragine & Serlenga, 2008). However, evidence of inequality of opportunity in terms of intermediate educational outcomes in tertiary education is under-researched. This dissertation addresses this gap by analyzing the effect of socio-economic background on intermediate educational outcomes for a sample of students at a university in the Netherlands.

Lastly, the theoretical contributions of EoP highlight how, besides abilities and effort, luck also plays a role in individuals' achievement. In line with arguments by Roemer, possessing certain abilities is also a form of luck. The EoP literature brings important contributions to the measurement of unfair outcomes but the evidence on whether circumstances impact the

perception of individuals regarding their outcomes is under-researched. There are studies that indicate how high achievers attribute their success to internal factors, and low achievers attribute their outcomes to external factors (Mezulis et al., 2004; Synder et al., 1976; Wen, 2018). However, the evidence on how socio-economic background impacts the way individuals attribute their achievement to their own effort specifically is under-researched. This dissertation contributes to the equality of opportunity literature by providing evidence on the perception of individuals about their outcomes and efforts, building on attribution theory from the field of psychology. The analysis entails estimating the moderating effect of socio-economic background on the relationship between achievement and attribution to effort.

## Chapter 2. Is there a Bright Side to Inequality of Opportunity? Evidence from the Roma Communities in North Macedonia and Serbia

*“That which does not destroy me makes me stronger.”*  
Out of life’s school of war – Friedrich Nietzsche (1888)

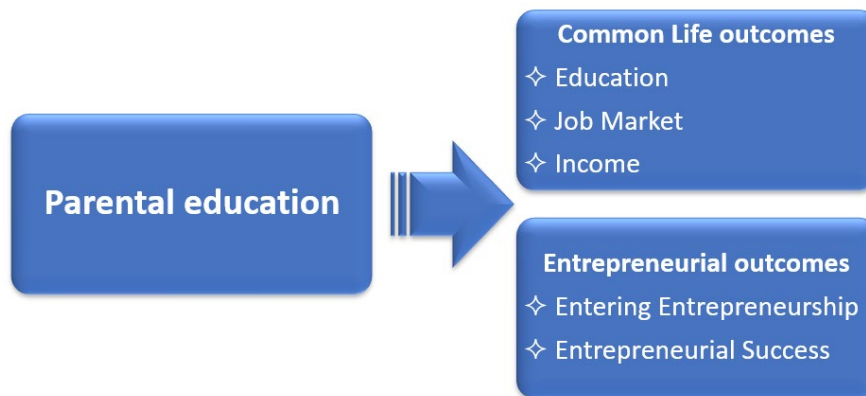
### 2.1. Introduction

Socio-economic disadvantage in early childhood leads to worse educational outcomes, as experiencing poverty as a child is linked to unequal educational opportunities. This results in missed learning in school, less long-term educational attainment and has consequences for labor market outcomes and income (Durlauf, 1996). In literature, this is referred to as the attainment gap and it can be observed as early as primary school. The attainment gap maintains or exacerbates inequalities in society. In addition, there is evidence indicating a negative effect of disadvantaged socio-economic background on health and even life expectancy (Bricard et al., 2020).

As highlighted above, the negative impact of a disadvantaged socio-economic background for an individual and society is well established. However, the literature that highlights any upside of having a disadvantaged economic background is sparse. There are claims that coming from a disadvantaged background can help develop certain traits, such as resilience (Masten, 2001). This can be an advantage when pursuing goals such as entrepreneurship. Moreover, there is evidence indicating how experiencing difficulties during childhood encourages people to start a business (Drennan et al., 2005). Furthermore, a study comparing entrepreneurs with managers

found significant differences in family background. Entrepreneurs with a poorer relationship with their fathers, are more likely to take risks, exhibit more independency, take more initiative, and identify to a larger extent with their work (Malach-Pines et al., 2002).

This study expands the existing literature on equality of opportunity in two ways. First, the impact of socio-economic background on common life outcomes, such as education, employment, and income on a Roma sample is investigated. Secondly, the impact of adverse circumstances is explored by analyzing the effect of socio-economic background on entrepreneurial outcomes, both in terms of starting a business and entrepreneurial success. It is notable that in literature, the indicator of socio-economic background with the most significant impact on life outcomes is parental education (Erola et al, 2016). Hence, this study focuses on this indicator. The sample analyzed is of Roma communities from North Macedonia and Serbia.



**Figure 2.1. Conceptual Model**  
*Source: author's contribution*

## 2.2. Hypothesis Development

### The Effect of Parental Education on Educational Attainment

Educational attainment is largely determined by parental education (Erola et al,2016). A meta review study concludes that educational attainment is the strongest predictor of labor market success. It is more significant than cognitive skills, personality traits, and interpersonal competencies (Pellegrino &Hilton, 2013).

There is evidence explaining the mechanism behind the effect of parental education on educational attainment. One factor that drives the impact of parental education is that in unequal contexts, parents with higher education will get better paid jobs and live in neighborhoods with higher-quality schools, whereas parents with lower levels of education will live in poorer neighborhoods with worse quality schools (Durlauf,1996). In addition, there are findings indicating

how highly educated parents spend more time with their children and this might also contribute to the further difference in educational achievement of children with poorly educated parents compared to their peers with highly educated parents. A study across 14 countries shows that parents with a university education spend more hours per week with their children, compared to parents having only a high school or lower diploma. Remarkably, this effect holds for both working and non-working fathers and mothers. It is notable that highly educated parents spend less hours on household chores and leisure activities. It is not clear why more educated parents spend more time with their children, but it has significant implications for the intergenerational transmission of human capital (Guryan et al., 2008).

Furthermore, another factor that impacts educational outcomes that is particularly relevant for the sample analyzed, is segregation in schools. A longitudinal study from the USA showed that the average socio-economic level of the students in the school had an impact on their progress similar with their own socio-economic background. According to the most recent FRA report (2022), the Roma face discrimination and are more likely to attend segregated schools.

Given the reviewed evidence, it is expected that parental education will positively impact educational attainment in the Roma sample. In addition, there are high estimates of inequality of opportunity in the region where the sample is from. Furthermore, recent FRA data sheds light on the poor educational outcomes of Roma population in North Macedonia and Serbia. Hence, the following hypothesis:

*H1: Parental education has a positive effect on the level of education attained.*

### The Effect of Parental Education on Employment

A main determinant of income inequality is differences in wages. Overall, in the context of liberalized labor markets, the pay for a certain skill is dependent on supply and demand (Topel, 1997). Educational attainment is the main determinant of disparity of wages, as it makes it possible to acquire the skills needed to perform a job and it also signals the level of productivity for an individual (Spence, 1997). Moreover, educational attainment is the strongest predictor of labor market success. It is more significant than cognitive skills, personality traits and interpersonal competencies. Individuals with more education are more able to complete an assigned task, gain more knowledge from training and are more efficient in allocating work resources (Pellegrino & Hilton, 2013).

The findings of a comprehensive study in the USA on the effect of socio-economic background on employment outcomes indicate that when considering different elements of socio-economic background, parental education predicts occupation to the highest extent and income the least. Moreover, parental income has no independent effect besides parental education (Erola et al., 2016). Notably, the context of these findings is given by a sample from Finland, a country

with a low level of inequality of opportunity for OECD standards. The impact of parental income might be more significant in more unequal contexts. For example, a study on a U.S. sample finds a significant effect of a higher earned income tax credit on both educational outcomes and on the likelihood of being employed (Bastian and Michelore, 2018).

The mechanism of how parental education influences employment outcomes is highlighted in the literature. Evidence from psychology highlights that socio-economic background indirectly impacts children's educational achievement through parents' beliefs and expectations (Davis-Kean, 2005). Moreover, besides the level of parental education, there are factors which can have a more indirect effect and thus influence employment options, such as social capital given by the neighborhood you are born in (Ioannides & Loury 2004).

Given the reviewed evidence, it is expected that parental education will positively impact employment outcomes in our Roma sample. This conclusion is based on the consensus in literature, including that the effect is stronger in more unequal contexts. Hence, the following hypothesis:

*H2: Parental education has a positive effect on employment rates.*

### The Effect of Parental Education on Income

So far, it has been established that socio-economic background impacts both educational attainment and employment outcomes. This effect holds for income outcomes as well. As already mentioned, there is a mechanism that explains how the effect of socio-economic background on income outcomes plays out. Families from an advantaged socio-economic background tend to cluster together in "better" neighborhoods. These have schools with a higher quality of education and their children will attain higher educational outcomes, which will lead to higher paid jobs. On the other hand, poor families tend to live in neighborhoods with worse quality of education and their children will have lower educational attainment and lower-paid jobs as adults (Durlauf, 1996).

This clustering effect has an influence of its own, as there is evidence on how the average socio-economic background of the students in a school has a positive significant effect on the educational outcomes of an individuals, independently of their own socio-economic background. Thus, parents transmitting economic status and income inequality becomes persistent. This clustering effect hampers economic mobility and exacerbates inequality (Caldas & Bankston, 1997). It is expected that this pattern will be more prevalent in more unequal contexts.

Empirical evidence confirms the pattern mentioned above. A cross-country study on developed countries finds a strong correlation between income disparity and inequality of opportunity. Moreover, applying a non-parametric measurement, the study finds that socio-economic background is the main driver of inequality of outcome. Italy and the USA stand out as

the most unequal societies both in terms of inequality of outcome and opportunity, whereas the Scandinavian countries are the most equal (Lefranc et al., 2008).

There is also research that established a causal effect of parental education on income. A study on a sample from Finland concluded that holding everything else equal, parental education predicts children's income but to a lesser extent than the impact on education and occupation (Erola et al., 2016).

Given the reviewed evidence, it is expected that parental education will positively impact income outcomes in the Roma sample. This conclusion is based on the consensus in literature, including that the effect is stronger in more unequal contexts. Moreover, there are high estimates of income inequality of opportunity in the region where the sample is from. Hence, the following hypothesis:

*H3: Parental education has a positive effect on income.*

#### The Impact of Socio-economic Background on Entrepreneurship

There is evidence highlighting the fact that individuals with a more disadvantaged socio-economic background encounter more barriers in entrepreneurship since they have less access to resources such as education, financial capital to start a business but also more limited networks and less mentoring opportunities (Dodd & Keles, 2005).

Another study found significant differences in family background between managers and entrepreneurs. The findings indicate that entrepreneurs had a worse relationship with their fathers. They also were more willing to take risks, to take initiative, showed more independence, and identified to a larger extent with their work (Malach-Pines et al., 2002).

The previous section established that parental education has a positive effect on employment rates. There is also evidence that shows how entrepreneurship is an alternative to unemployment (Van der Zwan et al., 2016). By extrapolating, it can be assumed that in the context of high inequality and low unemployment rates, individuals with highly educated parents, are more likely to have better labor market position and might be more reluctant to take the risk of entrepreneurship. Thus, the impact of parental education on becoming an entrepreneur can be explained by educational attainment. As already mentioned, individuals with parents who have low levels of education, are more likely to have low educational attainment. Especially in highly unequal contexts, they might be pushed out of necessity into entrepreneurship. Given the findings mentioned above, it is noteworthy that the Roma entrepreneurs sample might be motivated also by necessity, given the widespread disadvantage the community experiences (FRA, 2022). Hence, it is expected that parental education has a negative effect on becoming an entrepreneur. The following hypothesis is formulated:

*H4: The impact of parental education on engaging in entrepreneurship is negative.*

On the other hand, empirical evidence shows that among the individuals who engage in entrepreneurship, education level is positively associated with entrepreneurship performance (Unger et al., 2011). It is expected that parental education will have a positive effect considering the correlation between education level and business success, and the correlation between parental background and education level. Another mechanism that could explain the impact of parental education on entrepreneurial success is that parents with higher education would have higher incomes and more resources available to support their children with investments in their entrepreneurial activity. Hence, it is expected that parental education has a positive effect on entrepreneurship success. The following hypothesis is formulated:

*H5: The impact of parental education on entrepreneurship success is positive.*

## 2.3. Methodology

### 2.3.1. Sample

This study makes use of secondary data, collected in 2022 by REDI to study the impact of Covid on entrepreneurs from Roma communities in North Macedonia and Serbia. The data was collected with a 49-item survey within a period of six weeks during February and March 2022, and 1451 respondents were reached in both countries. For estimating hypothesis number 5, about the effect of parental education on entrepreneurial success, only the sub-sample of entrepreneurs is included-a total of 276 observations.

### 2.3.2. Variables

#### Dependent Variables

In this study, there are five dependent variables, grouped as follows. First, there are common life outcomes, education, employment, and income. There are also entrepreneurial outcomes, including becoming an entrepreneur and entrepreneurial success.

The first dependent variable is educational attainment. The applied measure is the highest level of education attained. It has seven categories, from no school to graduate studies. Hence, it is an ordinal variable, from 1-7.

The second dependent variable is employment rate, a binary variable, where 1 =being employed and 0= being unemployed (Benes& Walsh,2018). The third dependent (outcome) variable is income. Building on Yu (2019), it is measured by a Likert scale from 1-5 (much below the minimum salary-much above the minimum salary). Hence, income is an ordinal variable, from 1-5.

The fourth dependent (outcome) variable is being an entrepreneur. It is a binary variable, where 1= being an entrepreneur and not being an entrepreneur=0 (Arenius & Minniti,2005). The



fifth dependent(outcome) variable is being a successful entrepreneur. There are different measures of entrepreneurial success in literature (Brockner et al., 2004; Fisher et al., 2014). Following Caliendo and Kritikos (2008), entrepreneurial success is measured by the total number of employees.

### Independent Variables

Parental education is the independent variable, and this is calculated as the average of education level of both parents. The same measure described for education level, following Holmund et al., 2011 is applied for both maternal and paternal education.

### Control Variables

For the common outcomes (education, employment, and income), following the ERBD (2016) inequality of opportunity report, indicating age, gender and area of living to be significant circumstances, these are added as control variables. It is notable that age is a discrete variable. Gender is a binary variable, where female=1 and male=0. Similarly, area is also a binary variable, where living in an urban area=1 and living in a rural area=0. In addition, following Erola et al., (2016) for employment and income outcomes, education level is controlled for.

### 2.3.3. Estimation Strategy

#### Preliminary Analysis

The preliminary analysis included tests for normality, heteroskedasticity and multicollinearity ahead of the model specification. Based on the Shapiro-Wilk test and visual inspection of variables, it is concluded that the assumption of normality does not hold. Moreover, the Breusch Pagan test indicates the presence of heteroskedasticity. Lastly, testing the intended models for multicollinearity indicates that it is not a concern and both mother's education and father's education can be included in the same model, although these are correlated.

Below is a summary table for each hypothesis and model, with literature references for the dependent variables' measures.

Hypotheses	Dependent Variable	Literature from which the measure is based or derived from	Estimation Model
Parental education has a positive impact on educational achievement	Education level- Ordinal (1-7)	Holmund et al. (2011)	Ordered logit, robust
Parental education has a positive impact on employment	Employment- binary (0-1)	Benes& Walsh (2018)	Logit, robust

Hypotheses	Dependent Variable	Literature from which the measure is based or derived from	Estimation Model
Parental education has a positive impact on income	Income-ordinal (Likert scale 1-5)	Forster et al. (2013) Yu (2019)	Ordered logit, robust
Parental education has a negative impact on becoming an entrepreneur	Entrepreneur- binary (0-1)	Arenius & Minniti (2005)	Logit, robust
Parental education has a positive impact on entrepreneurial success	Entrepreneurial success -number of employees- discrete (1-35). The variable is log transformed.	Caliendo and Kritikos (2008)	OLS, robust

## 2.4. Findings

### 2.4.1. Descriptive Statistics

The average age of individuals in the sample is 35.5 years and only 38% are women, the rest are men. Most of them (82.7%) live in urban areas. The average education level is 2.5, ranging from 1-7. This indicates that most respondents did not graduate from secondary education. On average, 24% of individuals in the sample are entrepreneurs and 38% declare to be employed. Entrepreneurial success, measured by number of employees has a mean value of 13.6 with a standard deviation of 8.06 and it ranges from 1-35.

In terms of income, on a scale from 1-5, the average is 2.3. This is equivalent to that somewhere below the minimum wage and equal to the minimum wage. It is notable that the scale for measuring education levels ranges from 1 = no school, to 7 = graduate school but there are no observations for maternal education with values of 7. Moreover, the mean for maternal education is lower, 1.77, compared to paternal education, at a mean of 1.93.

**Table 2.1. Descriptive Statistics. Full Sample**

Variable	Obs	Mean	Std. Dev.	Min	Max
Age	1408	35.548	11.464	16	65
Area	1381	.829	.377	0	1
EducLevel	1393	2.498	.998	1	7
Entrepreneur	1404	.242	.429	0	1
Ensucces	303	13.673	8.06	1	35
Employed	1408	.379	.485	0	1
Gender	1404	.386	.487	0	1
Income	1222	2.283	1.211	1	5

Variable	Obs	Mean	Std. Dev.	Min	Max
FatherEduc	1167	1.928	.825	1	7
MotherEduc	1177	1.767	.723	1	5
Parental Education	1143	1.849	.686	1	4

*Source: author's calculations in Stata*

### 2.4.2. Correlation Matrix

There is a negative correlation between age and educational level, maternal and paternal education. This indicates an increase in educational attainment in the community over time. There is a positive correlation between paternal and maternal education with education level, indicating that there might be a positive effect of parental education on educational attainment. Moreover, there is significant positive correlation between education level and being employed. Furthermore, there is a positive correlation between maternal and paternal education, indicating assortative mating based on education level. Not surprisingly, "country" has a weak correlation with education level and employment, highlighting again that the respondents in North Macedonia have slightly lower levels of education and a much higher rate of unemployment.

A separate correlation matrix has been estimated for the entrepreneurs' sub-sample. The results are similar. It is notable that there is a weak positive correlation between being an entrepreneur and both maternal and paternal education. In addition, entrepreneurial success has a weak correlation with education level and income and maternal education. This is an indication that more highly educated individuals are likely to become entrepreneurs.

**Table 2.2. Correlation Matrix Full Sample**

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(1) Age	1.000									
(2) Area	0.015	1.000								
(3) EducLevel	-0.114***	-0.111***	1.000							
(4) Employed	0.017	-0.171***	0.362***	1.000						
(5) Gender	-0.047*	-0.082***	-0.075***	-0.016	1.000					
(6) Income	0.143***	-0.089***	0.383***	0.457***	-0.130***	1.000				
(7) FatherEduc	-0.076***	-0.049*	0.497***	0.324***	-0.047*	0.363***	1.000			
(8) MotherEduc	-0.114***	-0.056*	0.524***	0.366***	-0.072**	0.382***	0.573***	1.000		
(9) parental_educat	-0.102***	-0.062**	0.565***	0.383***	-0.065**	0.419***	0.902***	0.871***	1.000	
(10) country	-0.020	0.322***	-0.297***	-0.514***	-0.009	-0.442***	-0.339***	-0.315***	-0.370***	1.000

\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

*Source: author's calculations in Stata*

### 2.4.3. Main Results

#### The Effect of Parental Education on Education, Employment, and Income

Table 2.3 below summarizes the results for the three hypotheses in the study regarding the impact of parental education on common life outcomes, education, employment, and income. The ordered linear regression analysis in model 2 indicates a positive effect of parental education on education attainment. Based on these findings, hypothesis 1 holds.

Moreover, the logit regression in model 4 highlights a significant positive impact of parental education on being employed, indicating that hypothesis 2 holds. Furthermore, results of model 6 indicate a significant positive impact of parental education on income. Thus, hypothesis 3 holds as well.

**Table 2.3. The Effect of Parental Education on Education, Employment, and Income**

	(1)	(2)	(3)	(4)	(5)	(6)
	EducLevel	EducLevel	Employed	Employed	Income	Income
Age	-0.03** (0.00)	-0.01 (0.01)	0.01* (0.01)	0.01* (0.01)	0.03** (0.00)	0.04** (0.01)
Area	-0.15 (0.14)	-0.16 (0.18)	-0.05 (0.18)	-0.06 (0.20)	0.46** (0.16)	0.38* (0.17)
Gender	-0.49** (0.11)	-0.06 (0.12)	-0.06 (0.14)	-0.09 (0.16)	-0.32** (0.11)	-0.31** (0.12)
Country	-1.14** (0.10)	-1.04** (0.14)	-2.16** (0.14)	-2.28** (0.18)	-1.62** (0.13)	-1.48** (0.15)
parental_education		1.87** (0.12)		0.60** (0.14)		0.77** (0.11)
EducLevel			0.77** (0.11)	0.43** (0.11)	0.55** (0.06)	0.30** (0.08)
Constant			-1.77** (0.38)	-2.14** (0.42)		
/						
cut1	-3.71** (0.24)	0.24 (0.34)			1.32** (0.29)	2.24** (0.34)
cut2	-1.91** (0.22)	2.58** (0.36)			2.37** (0.29)	3.32** (0.34)
cut3	1.00** (0.22)	6.14** (0.42)			3.82** (0.31)	4.80** (0.35)
cut4	1.71** (0.24)	6.81** (0.43)			5.94** (0.35)	7.01** (0.42)
cut5	2.05** (0.26)	7.22** (0.44)				
cut6	3.63** (0.43)	8.77** (0.56)				
N	1363.00	1117.00	1363.00	1117.00	1195.00	1107.00
Pseudo R2	0.0504	0.1911	0.2652	0.2998	0.1181	0.1379

\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

Source: author's calculations in Stata

### The Effect of Parental Education on Entrepreneurial Outcomes

The findings in table 2.4, model 2 indicate that parental education has a positive effect on becoming an entrepreneur, which is the opposite direction of the hypothesized effect. Hence, hypothesis 4 does not hold. The results in model 4 highlight a significant effect of parental education on entrepreneurial success, indicating that hypothesis 5 holds.

**Table 2.4. The Impact of Parental Education on Entrepreneurial Outcomes**

	(1)	(2)	(3)	(4)
	Entrepreneur	Entrepreneur	In_Ensucces	In_Ensucces
Age	0.06** (0.01)	0.06** (0.01)	0.01** (0.00)	0.01** (0.00)
Area	0.58** (0.20)	0.43+ (0.23)	-0.03 (0.12)	-0.07 (0.12)
Gender	-0.54** (0.15)	-0.62** (0.16)	-0.14 (0.09)	-0.09 (0.09)
EducLevel	0.32** (0.07)	0.23** (0.08)	-0.03 (0.05)	-0.05 (0.05)
country	-0.82** (0.15)	-0.49** (0.18)	0.07 (0.08)	0.07 (0.08)
parental_education		0.34* (0.13)		0.20** (0.07)
Constant	-4.22** (0.40)	-4.55** (0.46)	2.14** (0.23)	1.75** (0.24)
N	1362.00	1116.00	296.00	274.00
F			2.25	3.29
Pseudo R2	0.1235	0.1235	R2 0.0410	0.0583

\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

Source: author's calculations in Stata

#### 2.4.4. Robustness Checks

With the aim of further confirmation of the main results, a robustness check regarding the measurement of parental education has been applied. The analysis for all five hypotheses has been repeated with making the distinction between maternal and paternal education.

The robustness check further confirms most of the results of the main analysis. Furthermore, the findings that maternal education has a more significant impact for both common

life and entrepreneurial outcomes, strengthens the conclusion that both types of outcomes have a similar pattern of advantage and disadvantage transmission. This analysis does not confirm the significant findings with the opposite sign regarding hypothesis 4. A likely explanation is that the effect of parental education on becoming an entrepreneur is influenced to a higher extent by the average parental education. Below is a summary of the findings.

<b>Hypotheses</b>	<b>Main Results</b>	<b>Robustness Check</b>
<i>H1: Parental education has a positive effect on educational attainment.</i>	Holds	Holds for both maternal and paternal education
<i>H2: Parental education has a positive effect on employment.</i>	Holds	Holds only for the maternal education
<i>H3: Parental education has a positive effect on income.</i>	Holds	Holds for both mother's and father's education
<i>H4: The impact of parental education on engaging in entrepreneurship is negative.</i>	Does not hold, statistically significant effect with opposite sign	Does not hold. The effect is not statistically significant for either maternal or paternal education
<i>H5: The impact of parental education on entrepreneurship success is positive</i>	Holds	Holds for maternal education

## 2.5. Conclusions

### 2.5.1. Conclusion

These results which indicate a significant positive impact of parental education on education, employment and income are in line with previous literature. In addition, the difference between maternal and paternal education highlights how the patterns of transmission of advantage and disadvantage for the Roma population in North Macedonia and Serbia are similar to other populations in Europe, as highlighted by previous research. The findings about the effect of parental education on entrepreneurial success are also in line with previous literature. There is a significant impact of parental education on entrepreneurial success, measured by the number of employees. These findings are in line with the literature that indicates how a higher socio-economic background can contribute to the success of an entrepreneur (Anderson & Miller, 2003; Nair & Anu, 2006).

On the other hand, the analysis of parental education 's impact on becoming an entrepreneur indicates a significant positive effect, it has the opposite sign of what was hypothesized. A possible explanation for this effect is that in the context of the Roma community, even individuals with higher parental education and consequently higher educational attainment still face barriers in the job market due to discrimination. Specifically, according to the latest FRA survey, 25% of Roma in North Macedonia and 37% in Serbia, report experiencing discrimination

when looking for a job in the past 12 months (FRA,2022). Hence, the individuals who are more skilled, explained by higher parental education, might turn to entrepreneurship due to necessity as well. Moreover, it is expected that discrimination impacts the Roma individuals with lower parental education even more, but they may face higher barriers in terms of resources, and that prevents them from entering entrepreneurship. The ones with higher parental education and consequently higher levels of education are better equipped to start a business than individuals with lower levels of parental education. Hence, they are more likely to engage in entrepreneurship. These findings add to the evidence which links both entrepreneurial initiation and success to a favorable socio-economic background. Linking the findings of this study with the quote in the introduction representing the premise of this study, the conclusion can be drawn that “what doesn’t destroy me, does *not* make me stronger”.

### 2.5.2. Limitations and Further Research

A first limitation of this study stems from measuring entrepreneurial success by the number of employees. Applying other measures, such as survival period, and company performance measures that include financial information could be more informative for entrepreneurial success than the number of employees.

The findings indicate a positive effect of both maternal and paternal education on becoming an entrepreneur and succeeding at entrepreneurship. It would be relevant to include other parental background indicators that could shed light on the pathways of the effect of parental education on entrepreneurial success, such as parental occupation and income (Chlostá et al., 2016).

Moreover, a relevant future research direction would be to include in the data also non-Roma respondents living in the same or similar areas. This would make it possible to estimate whether Roma people are more likely to engage in entrepreneurship compared with a comparable non-Roma group. Furthermore, in the context of Equality of Opportunity literature, another possible research avenue would consist of comparing both common life outcomes and entrepreneurial ones with a comparable non-Roma group, including applying a measure of inequality of opportunity that entails estimating the level of “unfair” inequality.

It would be relevant to repeat the study and aim to have two different contributions. First, comparing the results with those of a non-Roma group would bring insight on whether the level of inequality of opportunity differs from the general population. Moreover, repeating the study on a disadvantaged group where the overall poverty indicators in the country are low, would help shed light on whether there is a silver lining of being relatively worse off, in a context where access to resources is not a major barrier.

## Chapter 3. The Moderating Effect of Socio-Economic Background on the Relationship between Achievement and Attribution to Effort

### 3.1. Introduction

*“If I am responsible for having accrued a handsome share of worldly goods – income and wealth, power, and prestige – I must deserve them. Success is a sign of virtue. My affluence is my due.”*

Michael Sandel, “The Tyranny of Merit” (2021), p.56.

The main scope of reducing inequality is to ensure equal chances for individuals before they enter the job market. Studies show that investment in early childhood, primary and secondary education should take priority, as it is most rewarding for low-income families (Corak, 2016). Moreover, fostering equality of opportunity and focusing primarily on ensuring equal access to education seems to be not only efficient, but also in line with meritocratic principles. Meritocracy describes a social or political system in which individuals in a given society are rewarded or given opportunities based on their abilities, talents, and achievements (Kim & Choi, 2017).

There are critics who argue that meritocracy in education is an unfulfilled promise and even has negative effects, as it is an inaccessible ideal because opportunities for merit are linked to non-meritocratic factors such as family background (Mijs, 2016). Moreover, there are studies indicating how the least able children from high-income families are more likely to graduate from university than most able children from lower-income families (Papageorge & Thom, 2017). There are also studies that find a positive relationship between residing in high-income inequality areas and meritocratic beliefs of people with the lowest incomes (Morris et al., 2022; Solt et al., 2016).

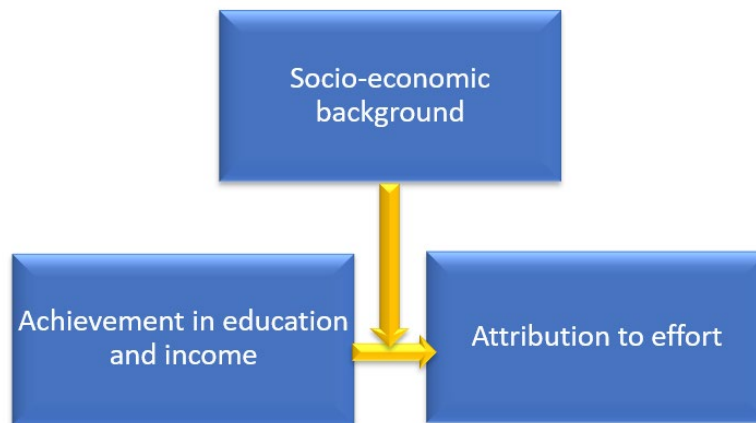
The critics of meritocracy go beyond the failure of living up to its stance on equality of opportunity. There are also concerns regarding its disruptive effect on social cohesion, as it makes the “winners” feel more deserving than they are of the outcomes they reach. On the other hand, those “losers,” besides being poor, will also feel guilty (Lipsey, 2014). In his book, “The Tyranny of Merit,” Michael Sandel makes a compelling argument that meritocracy is inherently damaging. He explains that its negative consequences are twofold: First, it may rather reinforce inequality than alleviate it, as it normalizes the idea of reward as explanation for existing inequality. Second, it may create hubris among the “winners” and add a sense of humiliation for the “losers” in society (Sandel, 2020).

Empirical evidence partially sheds light on the effect mentioned above. There are studies that investigated the link between effort attribution and achievement. Findings indicate that higher



effort attribution is linked to higher achievement (Georgiu,1999; McClure et al.,2011). Moreover, high achievers attribute their success to internal factors, and low achievers attribute their outcomes to external factors (Mezulis et al.,2004; Synder et al.,1976; Wen,2018). However, the evidence on how socio-economic background impacts the effect of achievement on how individuals attribute their achievement to their own effort specifically, is under-researched.

Hence, this study further expands the equality of opportunity literature by analyzing the moderating effect of socio-economic background on the relationship between achievement and attribution of achievement to effort (see the conceptual model below).



**Figure 3.1. Conceptual Model**  
*Source: author's contribution*

## 3.2. Hypothesis Development

### 3.2.1. Attribution of Achievement to Effort

There is ample empirical evidence which confirms the intuitive expectation that attributions of effort, ability and other internal factors are positively related to achievement, whereas attributions of outcomes to luck or other external factors have a negative correlation with achievement. For example, a study on a Greek Cypriot sample of 477 students and their parents confirm that when children attribute achievement to effort, ability, and other internal factors, they are more likely to attain higher levels of achievement whereas attributing achievement to luck and other external factors is correlated with low achievement. Moreover, when making the distinction between low and high achievers, the findings show that low achievers tend to consider that the outcome is explained by external factors, such as luck, or parents and teachers. On the other hand, high achievers attributed their outcomes to their own effort and other internal factors. There are also some notable gender differences: for example, girls are more likely to attribute their

achievement to effort. There was no statistically significant link between the parental and child attributions (Georgiu, 1999).

Another study, in New Zealand, carried out on a sample of 5,333 secondary school students with a diverse ethnic background confirms that attributing success to effort is related to higher educational achievement. It also highlights the theory that attribution of success to luck and failure to family and friends predicts lower achievement. The findings show that motivations and attributions explain 38% of GPA in the sample. Besides the strong positive impact of motivation, attribution to effort is positively related to achievement.

On the other hand, the effect of achievement on attribution of outcome to effort is less documented and the evidence is more indirect. A meta-review study indicates evidence for self-serving bias, indicating that people tend to attribute success to internal factors and attribute failure to external factors (Mezulis et al 2004). This tendency is also known in the literature as egotism, since the goal is to put oneself in the best possible light (Synder et al., 1976). However, when it comes to attribution of failure, the empirical evidence is less conclusive (Miller & Ross, 1975). A recent study in China highlights the idea that context alters the effect of attribution of failure and success in education. The findings indicate that when the results were made public, the students attributed failure more to external factors than themselves in order to maintain their self-image and self-esteem (Wen, 2018).

Considering the evidence mentioned above on both the link between attribution of effort and academic achievement and achievement on attribution to external or internal factors, it can be concluded that the higher the degree of achievement, the higher the level of attribution of achievement to effort. It is noteworthy that the evidence reviewed is mostly based on correlational studies and observing effort is challenging, so the findings should be interpreted with the limitation that attribution of effort does not equal actual exerted effort. Moreover, most of the evidence reviewed focuses on educational achievement as an outcome but later life outcomes such as employment and income are also markers of achievement. Although there is a strong impact of educational achievement on career achievement, they are different outcomes and career success is an outcome that is also more sensitive to luck and the surrounding community. There might be differences when it comes to the size of the effect for achievement in terms of education and career achievement, but it is expected that the direction of the effect will be the same. Hence, the following hypothesis is formulated:

*H1: There is a positive impact of achievement on attribution to effort*

### 3.2.2. Socio-economic Background and Achievement Attribution to Effort

A study on a Chinese sample of teenagers investigated the impact of perceived value of effort and academic achievement. In addition, differences for disadvantaged families were also

estimated. Findings indicate that the higher the perceived value of effort, the higher the level of academic achievement and this effect is partially mediated by educational expectations. These findings highlight how individuals will not exert effort if they don't think it will translate into achievement. Moreover, if they expect a positive outcome, it is more likely that they will sustain their efforts to achieve goals. The perceived value of effort impact on achievement is stronger for adolescents who come from disadvantaged families (Xie & He, 2019).

Moreover, there is another study in the context of education, on a US sample indicating a statistically significant effect of socio-economic background, measured by family income, mother's and father's education on exerted effort. However, when prior achievement and achievement are controlled for, the effect of socio-economic background diminishes significantly. There is also a significant effect of prior achievement on achievement, highlighting a reinforcing effect (Carbonaro, 2005). These findings, corroborated with the results of Xie and He (2019), indicate that despite people's socio-economic background, if they are made aware of the value of effort and this leads to achievement, they are more likely to exert effort.

In terms of attribution of achievement to effort and socio-economic background, there is a study that investigated what is the public perception of whether someone's success is deserved or not, depending on their family background. The findings indicate that people consider the same level of success to be less deserved by someone with a high-income background compared with a low-income background individual. Moreover, findings indicate that people are more reluctant to support individuals with a high-income background, when experiencing the same shared adversities, such as an economic downturn and achieved the same level of success as individuals with low-income background (Schnurr, 2022). These findings seem to be at odds with the evidence on meritocratic beliefs highlighted in the previous section.

The study did not account for the socio-economic background of the respondents, so conclusions cannot be drawn regarding socio-economic background and the perception of how others deserve their success in relation to their family income background. The illusory superiority bias effect indicates that people attribute more desirable traits to themselves (Hoorens, 1993). Thus, wealthy individuals might see others' success as less deserving when having a wealthy background but see their own success as well deserved. Moreover, if we are to extrapolate the findings, success would be internalized by successful individuals with a low socio-economic background. The reviewed evidence while developing the first hypothesis indicates a positive effect of achievement on attribution to achievement to effort. Furthermore, there are sociology studies that highlight how parents pass down their values to their children (Kohn et al., 1986; Min et al., 2012). Thus, assuming that high-achieving parents attribute their achievement to effort and pass down that belief to their children, their high-achieving children will also be more inclined to attribute achievement to effort.

To sum up, based on these reviewed findings, it is expected that socio-economic background positively moderates the relationship between achievement and attribution of achievement to effort. Hence the following hypothesis is formulated:

*H2: Socio-economic background has a positive moderating effect on the relationship between achievement and attribution to effort.*

### 3.3. Methodology

#### 3.3.1. Sample

This research makes use of secondary, cross-sectional data, collected by REDI<sup>1</sup> to study the impact of Covid on Roma communities in North Macedonia and Serbia. The data was collected within a period of six weeks during February and March 2022 and 1451 of respondents were reached in in both countries. The survey contained 49 items.

#### 3.3.2. Variables

##### Dependent

The dependent variable is attribution of achievement in education and career to effort. It is measured on a scale from 0-100% (0 meaning that the achievement cannot be explained at all by one's own effort and 100 that the achievement is explained solely by one's own effort).

##### Independent

There are two dimensions of achievement included in the study as independent variables. First, the education level, measured in levels, from no school to graduate studies, is an ordinal variable from 1-7 (Holmund et al, 2011). Second, the third dependent (outcome) variable is achievement in terms of income. Drawing from Benes& Walsh (2018); Forster et al.,2013; Yu (2019), it is measured on a Likert scale, from 1-5 (from much below the minimum wage to much above the minimum wage).

##### Moderating Variable

To estimate the moderating effect of socio-economic background, parental education is used as a proxy for socio-economic background, following Desai (1998) and Joseph et al., (2018). Parental education is calculated as the average of both parents' education level. Moreover, in literature, it is common to make the distinction between maternal and paternal education, as evidence highlights the fact that maternal education has a stronger effect on children's outcomes (Chevalier et al.,2010). Hence, this distinction is made in this study. Both maternal and paternal

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<sup>1</sup> REDI is an NGO established to economically empower Roma entrepreneurs and their communities in Europe.  
[DESPRE NOI - Portal REDI NGO \(redi-ngo.eu\)](https://www.redi-ngo.eu/)

education are an ordinal variable, measured in levels from 1-7 (from “no school” to “graduate studies”).

To estimate the moderating effect, dummies were created for both achievement levels and mother’s education, and based on these the following interactions terms were computed: High-High; High-Low; Low-High; Low-Low.

### Control Variables

Following Mezulis et al., (2004) control variables include age, gender, area of living. In addition, given that there are two countries in the sample, country will be controlled for.

### 3.3.3. Estimation Strategy

### 3.3.4. Preliminary Analysis

Ahead of estimation analysis, preliminary tests for detecting deviations from normality, heteroskedasticity and multicollinearity are run. The Breusch Pagan test indicates the presence of heteroskedasticity. Moreover, the Shapiro-Wilk test and visual inspection of variables indicates that the assumption of normality does not hold. Lastly, the test for multicollinearity indicates that all independent variables, measuring three different dimensions of achievement can be included in the model.

### 3.3.5. Main Effect

Given the cross-sectional data and limited character of the dependent variable, a Tobit estimation was conducted. In addition, given that the assumption of normality does not hold and neither does the presence of homoskedasticity, the Tobit model is more dependable than a linear estimation.

### 3.3.6. Moderation Estimation with Interaction Effects based on Dummies.

The moderation effect is estimated by running a Tobit regression. For this analysis four interaction terms based on dummy variables have been created. The interaction terms are composed of moderating variable (parental education) and both dimensions of achievement, education and income. Due to multicollinearity concerns, a separate model was estimated for both dimensions of achievement, education, and income. To have a reference category, one interaction term is excluded (the low-low combination is left out).

### 3.4. Findings

#### 3.4.1. Descriptive Statistics

The summary statistics highlight a fragile socio-economic standing of the surveyed communities. There is a rather low level of education, with two corresponding to primary education and income also corresponds to a level that is below the minimum wage. It is interesting that the mean score for attribution of achievement to effort is 64%, so most of the respondents consider that more than 50% of their achievement in education and career is explained by their own effort. The mean for attribution of achievement to effort in North Macedonia is 56%, whereas in Serbia it is 74%.

**Table 3.1. Summary Statistics- Full Sample**

Variable	Obs	Mean	Std. Dev.	Min	Max
Age	1398	36.062	11.639	18	78
Area	1388	.827	.378	0	1
EducLevel	1401	2.502	.995	1	7
Employed	1413	.381	.486	0	1
Efforteducareer	1379	64.793	24.543	0	100
Gender	1411	.381	.486	0	1
Income	1226	2.301	1.214	1	5
FatherEduc	1167	1.931	.824	1	7
MotherEduc	1180	1.771	.741	1	6
parental education	1145	1.855	.699	1	5.5
country	1417	.533	.499	0	1

*Source: author's calculations in Stata*

#### 3.4.2. Correlation Matrix

The correlation matrix highlights that there is moderate positive correlation between attribution of achievement to effort with education and income. Attribution of achievement to effort is moderately correlated with parental education. It is notable that the correlation with the father's education is a bit higher than the mother's education. It is also negatively correlated with gender, which is in line with previous evidence.

**Table 3.2. Correlation Matrix**

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
(1) Efforteducareer	1.000										
(2) Age	-0.093***	1.000									
(3) Area	-0.185***	0.024	1.000								

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
(4) EducLevel	0.377***	-0.154***	-0.103***	1.000							
(5) Employed	0.364***	-0.015	-0.165***	0.361***	1.000						
(6) Gender	-0.080***	-0.035	-0.084***	-0.073***	-0.010	1.000					
(7) Income	0.290***	0.108***	-0.079***	0.375***	0.450***	-0.130***	1.000				
(8) FatherEduc	0.327***	-0.114***	-0.044	0.495***	0.324***	-0.041	0.357***	1.000			
(9) MotherEduc	0.284***	-0.139***	-0.047*	0.535***	0.372***	-0.066**	0.382***	0.584***	1.000		
(10) parental_educ~n	0.343***	-0.139***	-0.054*	0.574***	0.388***	-0.057*	0.413***	0.902***	0.877***	1.000	
(11) country	-0.365***	0.002	0.319***	-0.290***	-0.507***	-0.011	-0.432***	-0.339***	-0.318***	-0.371***	1.000

\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

Source: author's calculations in Stata

### 3.4.3. Main Results

In the Table 3.4. below, model 1 is restricted to the dependent variable and controls, while model 2 includes the independent variables, the two dimensions of achievement, education, and income. As already mentioned, a separate moderating estimation model was run for each of the achievement dimensions for both measurements of the moderator, parental education, which includes maternal and paternal education.

**Table 3.3. Estimation of Moderating Effect including Interaction Terms based on Dummies, and Control Variables. Maternal and Paternal Education**

	(1)	(2)	(3)	(4)	(5)	(6)
	Efforteduccareer	Efforteduccareer	Efforteduccareer	Efforteduccareer	Efforteduccareer	Efforteduccareer
Efforteduccareer						
Age	-0.23** (0.07)	-0.10 (0.06)	-0.11+ (0.06)	-0.15* (0.07)	-0.07 (0.07)	-0.12* (0.07)
Area	-13.44** (2.02)	-0.08 (2.19)	-0.35 (2.23)	-0.68 (2.28)	-1.90 (2.24)	-1.03 (2.28)
Gender	-5.54** (1.57)	-2.27 (1.52)	-2.74+ (1.53)	-2.79+ (1.56)	-3.04* (1.53)	-3.27* (1.56)
EducLevel		6.19** (0.83)				
Income		1.30+ (0.72)				
country		-19.39** (1.84)	-21.94** (1.76)	-23.47** (1.77)	-21.15** (1.77)	-23.82** (1.76)
interHighMotherEducHighEduc			16.15** (2.37)			
interHighMotherEducLowEduc			30.85** (8.17)			
interLowMotherEducHighEduc			8.60** (1.85)			
interHighMotherEducHighIncome				17.34** (3.48)		
interHighMotherEducLowIncome				12.81** (3.63)		

	(1)	(2)	(3)	(4)	(5)	(6)
	Efforteducareer	Efforteducareer	Efforteducareer	Efforteducareer	Efforteducareer	Efforteducareer
interLowMotherEd ucHighIncome				5.58*		
				(2.62)		
interHighFatherEd ucHighEduc					17.68**	
					(2.10)	
interHighFatherEd ucLowEduc					15.09**	
					(4.21)	
interLowFatherEdu cHighEduc					6.60**	
					(1.99)	
interHighFatherEd ucHighIncome						16.89**
						(2.87)
interHighFatherEd ucLowIncome						11.84**
						(2.86)
interLowFatherEdu cHighIncome						3.04
						(2.93)
Constant	88.49** (3.08)	61.40** (4.04)	76.39** (3.27)	81.57** (3.17)	75.42** (3.30)	80.69** (3.19)
/						
var (e. Efforteducareer)	752.07** (32.88)	613.90** (28.92)	607.83** (29.11)	625.40** (30.07)	597.30** (28.78)	614.90** (29.72)
N	1330.00	1163.00	1121.00	1112.00	1110.00	1103.00
PseudoR2	0.0057	0.0340	0.0358	0.0326	0.0376	0.0344

\*p < 0.10, \*\* p < 0.05, \*\*\* p < 0.01

Source: author's calculations in Stata

### The Relationship between Achievement and Perceived Degree of Effort

The results of Tobit regression in Table 3.4. indicate that there is indeed a positive impact of achievement, measured by education level and income on attribution to effort. The effect of achievement in education is stronger, at 6.2% and then the income coefficient is 1.3%, it is significant at the 10% level with a p-value of 0.07. Based on these findings, it is concluded that hypothesis 1 holds for both achievement in education, and income.

### The Effect of Parental Background on the Relationship between Achievement and Attribution to Effort

The findings below indicate that socio-economic background, measured by parental education has a significant impact on the relationship between achievement and attribution to effort. The analysis of the interaction effects with dummies indicates the following results for both dimensions of achievement.



### *Achievement in Education*

The findings provide evidence for a positive moderating effect of parental education, as the effect of achievement in education on attribution to effort varies based on the level of parental education. The estimation of interaction effects including dummy variables indicate that, when taking the low maternal education – low achievement category as a reference, individuals with the same level of achievement but high maternal education, attribute their achievement to their own effort to a larger extent. The same pattern holds for both categories of individuals with high and low achievement, and high maternal education. See model 3 in table 3.4. To conclude, hypothesis 2 holds for achievement measured in terms of education.

### *Achievement in Income*

Similarly, parental education also moderates the relationship between achievement in terms of income. The coefficients of the interaction effects are based on dummy variables for both maternal education and achievement in income. The results indicate that, compared with individuals with low maternal education and low achievement, the group that also has low achievement but high maternal education reports 12.8% higher attribution to effort. The high-high group category reports even higher attribution to effort (17.3%). The coefficient for the high achievement–low maternal education, is 5.5% See model 4. The results are similar for paternal education, except that the results for the latter group are not significant. See model 6. To conclude, hypothesis 2 holds for achievement measured in terms of income.

#### 3.4.4. Robustness Checks

With the purpose of adding strength to the main findings described, several robustness checks have been conducted. First, the model specification was adapted to follow the widely used Baron and Kenney (1986) method of estimating moderation, which implies including both the independent and moderator besides the interaction effects. In addition, this model specification was re-run to include both independent and moderating variable and interaction effect as ordinal variables. Moreover, in terms of measurement a relevant robustness check entails adjustment of the threshold for higher education. Lastly, in the main analysis, a distinction is made between maternal and paternal education. A robustness check was run, entailing an average of the two, giving parental education. The conclusions drawn from the robustness checks described below in detail are the following. The model specification robustness check indicates insignificant results but cannot refute hypothesis 2, as they are not reliable in the context of multicollinearity and skewness. These confirm that the specification applied in the main analysis is more appropriate. Moreover, the robustness check of measurement confirms hypothesis 2.

### 3.5. Conclusion

#### 3.5.1. Conclusion

The results of the first hypothesis are in line with the previous literature regarding attribution theory of effort, specifically the findings of McClure et al., (2011) and Georgiu, (1999). This brings an addition to the previous literature, as perceived attribution of achievement to effort sheds light on how individuals estimate the extent that their own efforts contribute to their achievement. Moreover, the indicator for attribution of achievement to effort is based on a question that puts respondents in a position to reflect on past achievements, rather than their views in general about exerting effort. It is noteworthy that these findings cannot be interpreted as actual exerted effort.

These results of the second hypothesis add to the previous literature regarding the attribution theory of effort. They indicate that high achievers regardless of their background, are more likely to attribute their achievement to effort. However, based on the existing literature and evidence, it can be argued that high achievers with a low socio-economic background require a higher degree of effort to reach a high level of achievement than the group with high achievement and a high socio-economic background.

The results of the analysis are also in line with the literature that highlights the positive relationship between effort attribution and achievement in education, but also the literature in psychology that explains how people attribute success to internal factors and failure to external factors.

Moreover, it is possible that high achievers reflect on their achievement and overestimate how much it was due to own effort. Whereas low achievers might underestimate the effort they exerted because the achievement is relatively low, so that could explain the lower attribution to effort.

Lastly, as motivation for this research, Michael Sandel's argument that a meritocratic system may create hubris among the "winners" and add a sense of humiliation for the "losers" in society was invoked. Although, these results cannot fully confirm this statement, as it is not clear that the low achievement-low socio-economic group feel a sense of humiliation or guilt. The confirmation of hypotheses 1 and 2 partially support this statement. First, it confirms the assumption that higher achievers attribute their achievements to their own effort to a greater extent. One could argue that it is fair, and perhaps they indeed exerted a high degree of effort. Another interpretation would be that both groups of individuals with favorable (high parental education) and less favorable (low parental education) circumstances discount them. Moreover, the comparison analysis confirms the idea that given the same level of achievement, having more favorable circumstances is linked with higher attribution to effort.

Referring to the public perception of inequality of opportunity, there is evidence that indicates how most individuals do not hold others responsible for circumstances beyond their control, but they blame them for outcomes that stem from their own choices (Cappelen et al., 2010). The findings of this study highlight the fact that people might be less aware of the distinction between circumstances and effort when reflecting on their own outcomes.

### 3.5.2. Limitations and Further Research Recommendations

The first limitation of this study consists of the choice of proxy measurement for socio-economic background. It would be more informative if parental income was also accounted for. Moreover, a further research recommendation would be to include parental beliefs about the attribution of achievement to effort and parental aspirations for their children, as it might explain further the attribution of achievement to effort.

These findings are limited in terms of generalizability and further research can be expanded on a different sample, on a population that does not belong to a minority, as being part of a minority might influence the level of attribution of achievement to effort regardless of parental education background. It might lead people to consider that their achievement is explained more by their own efforts, in light of facing more barriers.

It is notable that the measure for attribution study does not account for their views in general about exerting effort. As a point for further research, it would be relevant to account for that as well. This would make it possible to draw bolder conclusions, as there is a link between belief about effort and exerting effort, and it is expected that there is a strong correlation between exerting effort and attribution of achievement to effort. Moreover, the choice of including objective measures of achievement in terms of education level and income suits the answer to the research question. However, it would be relevant to include a measure of the perceived level of achievement, as this is expected to further explain the attribution of achievement to effort and its impact could also be moderated by parental education.

Finally, based on the EoP literature, it is explicit that achievement in life is also influenced by luck. The results show that higher achievement is linked to higher attribution to effort. In line with EoP luck egalitarianism, assuming that higher achievement is also partially influenced by luck, it is possible that part of the achievement explained by luck might be attributed to effort. Based on the results of this study, it is not possible to draw conclusions about this difference. As a further research recommendation, it would be relevant to estimate how individuals attribute achievement to both luck and effort.

## Chapter 4. Inequality of Opportunity in Education – Evidence from a University in the Netherlands

### 4.1. Introduction

*“The seeds of inequality have deep roots and stubbornly persist, even in the most fertile soil of opportunity”.*

Unknown

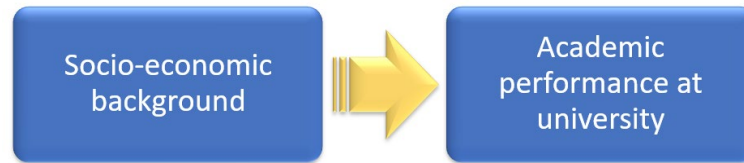
A study across OECD countries found that socio-economic status has a significant impact on learning outcomes and this effect is significantly stronger than gender and immigrant status. It also impacts participation in education, especially when it comes to early childhood and tertiary education, which involves higher private expenditure (OECD,2021).

There is extensive evidence on inequality of opportunity in preschool, primary and secondary education, but the topic of inequality of opportunity in tertiary education is under-researched (Palmisano et al., 2022). The few studies regarding inequality of opportunity in tertiary education are often framed in terms of access and long-term outcomes such as graduation rates and the transition to the job market (Brunori et al., 2012; Peragine and Serlenga,2008). Moreover, the inequality of opportunity in terms of short-term and intermediate educational outcomes at university is even less researched. This is primarily due to data availability, as standardized tests are not common in the university education setting (Palmisano et al., 2020). The topic is relevant because in light of the distinction between effort and circumstances within the equality of opportunity theory, there is the assumption that individuals from disadvantaged backgrounds usually have to exert higher levels of effort to access tertiary education. Furthermore, evidence of inequality of opportunity in educational outcomes at the tertiary education level indicates persistence, as tertiary education is preceded in most countries by public mandatory schooling, which is meant to be the great equalizer (Downey et al.,2004).

This study addresses this gap by analyzing the effect of socio-economic background on intermediate educational outcomes for a sample of students at a university in the Netherlands. This is a relevant sample, as the Netherlands is a country that aims to minimize inequality of opportunity in education. This is evident by lower-than-average private expenditures in pre-primary education, 13%, whereas the OECD average is 17%. In terms of tertiary education costs, only 29% are privately funded, which is just below the OECD average of 30% (OECD,2020)<sup>2</sup>. This indicates that costs are less of a barrier to participating in tertiary education.

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<sup>2</sup> Education GPS, OECD, 8/23/2023, 9:47:52 PM <http://gpseducation.oecd.org>"



**Figure 4.1. Conceptual Model**  
*Source: author's contribution*

## 4.2. Hypothesis Development

### The Impact of Socio-Economic Background on Tertiary Education Outcomes

A meta-analysis of the research into socio-economic status and academic achievement finds that many studies use a combination of one or more of parental education, occupation and income and others include parental expectations as well. Similarly educational outcomes are measured in many ways: grades on a test, completion of numbers of years of schooling or enrollment entrance to university (Sirin, 2005). This study focuses on the intermediary Grade Point Average (GPA).

A study across EU countries provides evidence on inequality of opportunity in tertiary education in terms of completion rates, based on an ex-ante parametric estimation method. The results highlight that inequality is lowest in northern European countries and highest in Eastern European countries. There is significant heterogeneity between countries, the lowest score is a total of 15.22% of tertiary education completion explained by circumstances, and it is 36.9 percent in the Czech Republic. For all EU countries, parental education and occupation are the most impactful circumstances. Financial problems of the family when the individuals were teenagers were also influential but are far less significant. Moreover, this circumstance is even less significant for the younger cohort in the study, indicating a decrease in inequality of opportunity in tertiary education over time. In the Netherlands, the sample which the study used, the total inequality of opportunity was 21.2% (Palmisano et al., 2022). It is notable that based on the 2018 Pisa, socio-economic circumstances predict 11% of the variation in reading performance, just below the OECD average of 12% (OECD,2023).

Moreover, an OECD study on the same topic explains further the pathway of inequality of opportunity in tertiary education. It highlights the fact that socio-economic background has the most significant impact on participation in education. The results highlight that there is a negative relationship between having a mother without tertiary education and being enrolled in early education and care facilities, which impacts cognitive development and further educational outcomes. Moreover, disadvantaged children are more likely to enroll in vocational programs and

are less likely to graduate. On a positive note, two out of three adults who have parents with low education attend a higher level of education. However, there is a relatively low share of tertiary education students without having at least one parent who attended it (OECD,2018).

It is relevant to investigate the outcomes for the small number of students with disadvantaged backgrounds who pursue university education, as it is assumed that they have exerted more effort to access tertiary education and they could face additional barriers to academic success. There is evidence regarding the inequality of opportunity in tertiary education in terms of long-term outcomes, such as graduation grades and earnings (Peragine & Serlenga,2008). Moreover, there is evidence that highlights the impact of socio-economic background on tertiary education outcomes linked to the job market. The findings indicate that compared to high-background graduates, university education improves the socio-economic standing of low-background graduates to a larger extent. However, they are more likely to experience low job and financial security for up to five years on graduation (Tomaszewski et al., 2021). The evidence on short-term and intermediate outcomes remains scarce, and this is explained by the lack of standardized testing in university education.

There are meta-studies that draw conclusions on the impact of socio-economic background on short academic achievement at university. The reviews, including evidence from the USA conclude that there is a weak correlation between socio-economic background and academic performance. One study found that there is a correlation, although weak between the GPA in the first year and retention in the second year of university (Westrick et al., 2015). Another study found a similar weak correlation between socio-economic background and academic performance (Schneider & Preckel,2017). As already mentioned, the list of factors that predict outcomes becomes longer, so that can explain the weaker impact of socio-economic background on outcomes. Unlike mandatory education, tertiary education entails a selection of students based on ability and knowledge. It is notable that the two reviews found a significant effect of prior education achievement on university GPA. A relevant study examined the relationship between high school socio-economic background and academic performance in the first year on a sample of students from a university in the USA that had policies in place meant to increase the share of disadvantaged students. The results indicate a strong effect of high school average socio-economic background on the first-year GPA, and this effect is stronger for low-income students.

Although, less impactful than the effect on mandatory education, the effect of parental background on intermediate tertiary educational outcomes can be explained by the fact that parents who attended university are better prepared to offer support and guidance to their children when they are encountering difficulties (Dennis et al., 2005). Moreover, social capital generated by the networks of parents can have a positive effect on educational outcomes (Sandefur et al,2006). Further, parents who have more disposable income can afford to offer extra support for

their children, so they do not need to seek a job next to their studies, and they can spend more time on studies or extracurricular activities.

To sum up, the reviewed evidence highlights a significant effect of socio-economic background and intermediate educational outcomes, although it is rather weak. Under the assumption that higher educated parents are better equipped to offer support to their children when encountering difficulties with studies, it is expected that parental education will have a significant effect on intermediate educational outcomes. The following hypothesis is formulated:

*H1: Parental education has a significant effect on intermediate educational outcomes at university.*

Moreover, university education also entails the cost of living. The Netherlands offers study grants to cover tuition fees and partial living costs, so financial barriers are not expected to be significant. However, there is evidence from other contexts that lower parental financial contributions have a positive impact on the number of hours worked and higher number of hours worked negatively impacts GPA (Kalenkoski et al., 2010). Hence, assuming that parents with more disposable income can contribute to the costs of living for their children and they focus on their studies and extracurricular activities, it is expected that parental income will also have a significant effect on intermediate educational outcomes.

*H2: Parental income has a significant effect on intermediate educational outcomes at university.*

### 4.3. Methodology

#### 4.3.1. Sample

The analysis makes use of primary data. It was collected at a research university in the Netherlands by means of online surveys. So far, 412 observations have been collected during the 2020-2022 Fall and Spring semesters. Participation in the survey was voluntary. In terms of population representativeness, the student body of the faculty is around 8,000 students, so the collected observations represent roughly 5% of the total student body of the population. For the purpose of this study, the focus was on a sample of students with Dutch nationality. Upon selecting the Dutch students, the remaining sample entails 236 observations.

#### 4.3.2. Variables

##### Dependent

The dependent variable in the paper is academic achievement at university given by intermediate educational outcomes. In the literature, the most common measure for academic

achievement is grades or GPA. This study will apply intermediary GPA as a measure of academic performance. It is notable that the data on GPA is self-declared. Grades are awarded based on a scale from 1-10 and. Hence, it is a discrete variable.

### Independent

The first independent variable in the study consists of parental education and it is computed by the average level of education for both parents. Following Holmund et al., (2011), both mother's education and father's education are measured on a scale with seven levels of education, from primary to doctoral education.

Moreover, the second independent variable is parental income. A relative measure of income is applied. Respondents were asked to assess the income of their parents compared with the average population. Furthermore, parental income is measured on a seven-point Likert scale.

### Control variables

Following O'Dea et al., (2018) and Billari & Pellizzari (2008), gender and age will be added to the model as control variables, as it is expected to have a significant impact on grades. To account for difficulty, study program will be included as a control variable.

### 4.3.3. Estimation Strategy

#### Preliminary Analysis

First, tests for the assumptions of normality and homoskedasticity were run. The results of the Shapiro-Wilk and visual inspection of the data indicate a violation of the normality assumption. In addition, the Breusch Pagan test indicates that the assumption of homoskedasticity does not hold. Moreover upon inspection of Vif scores, it is concluded that multicollinearity is not a concern, and the intended model can be estimated. Lastly, in order to account for common method bias, a factor analysis was performed. The test indicates that there is no concerning similarity.

#### Main Effect

Given that the independent variable is a discrete variable from 1-10, following Amemiya, (1984), an OLS estimation would be less reliable. A Tobit model is more suiting, as it accounts for the limited character of the dependent variable. Moreover, Tobit estimates are more reliable in the context of violation of normality and homoskedasticity.



## 4.4. Findings

### 4.4.1. Descriptive Statistics

The summary statistics indicate the following. The age range in the sample is between 17-28 and the mean is 21.1. Most of the respondents are male, 67% (only 33% are female). It is notable that the GPA ranges from 6.2 to 8.7, and the mean grade is approximately 7.217. In addition, the data indicates a higher mean for paternal education compared to maternal education. The mean for parental education is 4.1. On the scale, 4 corresponds to post-secondary professional education. Parental income has a high mean, 4.9, on a scale from 1-7.

**Table 4.1. Summary Statistics**

Variable	Obs	Mean	Std. Dev.	Min	Max
Intermediate GPA	207	7.217	.622	6.2	8.7
Age	235	21.183	2.414	17	28
Gender	236	.331	.471	0	1
parental education	166	4.16	1.293	1.5	7
parentincome	215	4.912	1.151	1	7
MotherEduc	185	3.935	1.393	1	7
FatherEduc	176	4.33	1.569	1	7

*Source: author's calculations in Stata*

### 4.4.2. Correlation Table

The correlation table provides an indication of the hypotheses. The results show a significant positive negative correlation between the average parental education and grades. It is notable that the coefficient for maternal education-grade correlation is stronger than for paternal education. Moreover, there is also a weak negative but not significant correlation between intermediary GPA and parental income.

**Table 4.2. Correlation Matrix**

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1) Intermediate GPA	1.000						
(2) Age	-0.090	1.000					
(3) Gender	0.105	-0.087	1.000				
(4) parental_educat~n	-0.211**	-0.070	-0.088	1.000			
(5) parentincome	-0.099	0.008	0.029	0.283***	1.000		

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(6) MotherEduc	-0.155**	-0.124*	-0.072	0.854***	0.233***	1.000	
(7) FatherEduc	-0.179**	-0.025	-0.109	0.882***	0.274***	0.508***	1.000

\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$       *Source: author's calculations in Stata*

#### 4.4.3. Main Results

First, model 1, where only the control and variables are included, shows no significant result and dummies for the programs are omitted due to multicollinearity. When the study program is accounted for, the number of observations decreases, so in the second model only age and gender are included as controls. The results in model 2 indicate a statistically significant negative effect of parental education on intermediary GPA. In the extended model 3, in which the study program is controlled for, this effect remains significant. Hence, hypothesis 1 is rejected, as the results indicate a significant effect in the opposite direction. The results from both models 2 and 3 indicate a statistically insignificant effect of parental income on intermediary GPA. It is notable that the sign is negative, also the opposite of what was hypothesized. Based on these findings, hypothesis 2 cannot be confirmed.

**Table 4.3. The Effect of Parental Education and Income on Intermediary GPA**

	(1) Grade	(2) rade
IntermediateGPA		
Age	-0.06 (0.04)	-0.06 (0.06)
Gender	0.10 (0.11)	0.18 (0.17)
Program1	-0.47 (0.30)	-0.11 (0.50)
Program 2	-0.10 (0.25)	0.27 (0.46)
Program 3	-0.24 (0.25)	0.13 (0.46)
Program 4	-0.42 (0.68)	-0.13 (0.85)
Program 5	-0.38 (0.25)	-0.10 (0.51)
Program 6	0.28 (0.38)	1.02 (0.64)
Program 7	-0.33 (0.23)	0.00 (.)
Program 8	0.11 (0.20)	0.00 (.)
parental_education		-0.14* (0.06)
parentincome		0.10 (0.08)
Constant	8.59**	8.38**

	(1) Grade	(2) rade
/	(0.99)	(1.54)
var(e.grade)	0.40** (0.05)	0.50** (0.08)
N	150.00	81.00
R2_pseudo2 = 0.0645	0.0277	0.0387

\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$  Source: author's calculations in Stata

#### 4.4.4. Robustness Checks

First, robustness checks in terms of measurement are considered. Based on Chevalier et al., 2013, which makes a distinction between maternal and paternal education and finds significant differences, this study applied a robustness check, making the same distinction between maternal and paternal education. Moreover, given the unexpected significant effect of parental education, a relevant robustness check was used to estimate the effect of parental education and income on academic performance for the groups with high and low parental education and income. These are meant to verify the significant effect in the opposite direction of what was hypothesized.

Based on the robustness checks performed, there is no support for hypotheses 1 and 2. However, they confirm further the evidence for the significant negative effect of parental education on academic achievement measured by intermediary GPA. Moreover, the results show a positive effect of low parental income on intermediary GPA. These findings also help explain the surprising significant negative effect of parental education on intermediary GPA.

## 4.5. Conclusions

### 4.5.1. Conclusion

The analysis indicates no support for hypotheses 1 and 2. On the contrary, there is evidence of a significant effect in the opposite direction for hypothesis 1, so parental education negatively impacts academic achievement measured by the GPA. These findings are not in line with the reviewed literature on the effect of parental education on academic performance. A positive effect was hypothesized but given the rather weak effect highlighted by previous evidence, it would not have been surprising if the effect would have been insignificant. The significant effect in the opposite direction is rather surprising, but considering the robustness checks applied, the findings can be seen as reliable. Moreover, the analysis including a dummy for low parental education and income, indicates a significant positive effect of low parental income on intermediary GPA, which can consolidate the significant negative effect of parental

education on the intermediate GPA. It is notable that these findings do not contradict the evidence on inequality of opportunity in terms of access to tertiary education, which takes as its sample the population at large, but these findings only hold for the sample that made it through the selection process.

There are several possible explanations for this surprisingly negative effect. First, the most plausible explanation is that the effect is driven by students with low parental education who are very motivated and students with high parental education who might be less motivated as they enrolled in university partly because it was an expectation that they would go to university. Moreover, as highlighted in the theoretical framework, under the EoP assumptions, holding everything else equal, students who are disadvantaged and enroll in university exert higher effort than their peers, as they have fewer resources. So, they might be more used to exerting effort and thus cope better with the demands of a university education. These findings should not be interpreted as indicating that there is reversed inequality, i.e., that students with highly educated parents are at a disadvantage and students with poorly educated parents have an advantage. It is still likely that students with low parental education and income are at a disadvantage, but they might be more motivated and exert extra effort, whereas students with highly educated parents might feel this pressure less.

An alternative explanation can stem from the fact that most of the data in the study was collected during the Covid pandemic. This could have influenced the findings in the following manner. It is likely that in light of uncertainty, the students with low and high parental education, respectively responded differently to it, as the students with lower parental education might have been more concerned about their future. This could explain the significant positive effect of low parental income on intermediary GPA.

There is also a very likely explanation linked to the research design. Given that participation was voluntary, it is possible that students with a low educational background and high grades had a higher interest in participating and that those with a similar background, but low grades felt uncomfortable in doing so.

Moreover, the study controls for difficulty by taking into account the study program but does not account for ability, which would have entailed including previous academic ability, such as secondary school leaving exam grades. This has been shown to predict academic achievement at university. Considering that children of parents who do not have a university degree are at a disadvantage in attaining access, the ones who do gain access might be more able. This effect could be further supported by the evidence from early tracking in the Netherlands. A recent study shows that independently of skill level, students from lower socio-economic backgrounds receive on average lower study advice. The authors decompose the outcome and find that 55% of the difference in advice is explained by skills. When indicators such as family,

school, and place of residence are added, the total explains 71% of the difference. There is no explanation for the 29% difference (Zumbuehl et al., 2022).

#### 4.5.2. Limitations and Further Research Recommendations

A major limitation of the study stems from the voluntary participation of students in the study. Given the topic of the research, it is possible that students with low parental education and high grades were more willing to participate, unlike their peers with low grades. In addition, due to data availability constraints, the study does not account for ability. A further research recommendation is to collect data in such a manner as to avoid the self-selection outcome and include data on initial academic achievement, such as high school leaving grades. It is notable that, although it is important to control for ability, at the stage of tertiary education, it is expected that due to the selection process, there will be less variation compared to a sample from mandatory education. So, it is unlikely that the sign will change from negative to positive.

Moreover, another limitation is that the study collects data only from one university and one faculty, namely Economics and Management. It would be relevant to include in the sample, data from students enrolled at other faculties and other universities in the Netherlands in order to increase the generalizability of the results. Another limitation of the study is that most of the observations were collected during the COVID-19 pandemic. This could have an influence on the results. Hence, it would be relevant to repeat the study in a period when there is no pandemic.

## Chapter 5. Conclusions

### 5.1. Joint Contribution of the Studies in the Dissertation

Each study sheds light on one particular aspect of inequality of opportunity. The study in the second chapter explores whether there might be a 'silver lining' to having adverse life circumstances by investigating the impact of parental education on entrepreneurial outcomes, besides education, employment, and income. The analysis did not support the hypothesis of a negative effect of parental education on becoming an entrepreneur. Hence, there is no indication for a 'silver lining' of adverse life circumstances. Moreover, the study in Chapter 3 investigates another dimension of inequality of opportunity, linked to the perception of individuals about their outcomes. This is a relevant addition to the findings in Chapter 2, as it sheds light on how socio-economic background impacts the perception of individuals regarding the extent to which their achievement is due to their own effort on the same sample. The results indicate the surprising conclusion that individuals with the same low levels of achievement, but higher parental

education, attribute more of their achievement it to their own effort compared with the low-low group. Similarly, the high-high group attributes their achievement to effort to a greater extent. This indicates that there might be no distinction between favorable or unfavorable circumstances in the perception of individuals when attributing achievement to own effort.

In Chapter 4, the aim was to draw conclusions about the persistence of inequality of opportunity by examining the effect of socio-economic background on academic achievement on a sample of students at a university in the Netherlands. However, the results indicated otherwise, as there is a negative effect of parental education on intermediate GPA. In addition, the robustness check analysis indicates that having parents with low income has a positive effect on intermediary GPA. These findings provide no support for the persistence of inequality of opportunity. Despite the fact that students with low parental education background are at a disadvantage in terms of circumstances, it seems that their motivation/ability outweighs this disadvantage. Hence, even though the findings of the study in Chapter 2 did not indicate a silver lining of inequality of opportunity, the study in Chapter 4 could be interpreted as such.

## 5.2. Policy Implications

The findings of this dissertation have the following policy implications. First, the analysis of the effect of parental education on common life outcomes highlights that, in the Roma communities in Serbia and North Macedonia, the pattern of transmission of disadvantage and advantage is similar to that found in other contexts. Roma social inclusion has different dimensions and according to the most recent FRA survey, it remains a challenge (FRA,2022). The conclusions of this analysis indicate that investing in education will have a long-term impact on future generations of Roma people, as evidence highlights a strong effect of parental education on educational outcomes. Second, considering the positive effect of parental education on entrepreneurial outcomes, it is possible that individuals who have difficulties in the job market due to a lack of education or discrimination can be more prone to turn to entrepreneurship. However, this might not be realized if the lack of resources is so low that they can't even try. So, it is important to develop support policies for those who want to pursue entrepreneurship but face high barriers.

In addition, the studies described in Chapters 2 and 3 cover the same sample. The first confirms the transmission of disadvantage and advantage from parents to children. The second confirms that there is a significant impact of achievement on attribution to effort, and this effect is strengthened by socio-economic background, measured by parental education. In terms of policy implications, the findings from both studies indicate that there is scope to raise awareness on how one 's circumstances explain a large part of outcomes, both high and low achievements, with the aim of fostering social cohesion. It is notable that it might be counterproductive to highlight to

individuals with low achievement, how their circumstances explain a large part of their outcomes, and focus on how they were given a bad hand in life. Moreover, some of the reviewed findings suggest that children from a disadvantaged background can benefit the most from being made aware of the link between effort and achievement (Carbonaro, 2005; Xie & He, 2019). It is important to not discard the impact of circumstances beyond one's control on life outcomes, but also highlight the fact that effort has a significant impact on achievement and that it is something individuals have more control over.

On the other hand, policy makers would make a futile attempt by focusing solely on interventions meant to address the perception of disadvantaged children regarding the importance of effort for achievement. They would also need resources that enable them to exert effort once they become aware of its importance. For example, an intervention aimed at adjusting perceptions about the impact of effort on achievement, without considering the availability of resources would be difficult to implement for Roma children who grow up in poverty, live in segregated areas, and go to segregated schools. Moreover, highlighting the connection between effort and achievement in the context of high inequality and poverty might further reinforce damaging meritocratic beliefs among low-income people living in highly unequal contexts, as is mentioned in Chapter 3.

Finally, reflecting on the findings from Chapter 4, other policy implications can be derived. The findings indicate that in a context where policies aimed at diminishing inequality of opportunity in education are in place, students with less educated parents not only can attend university but also outperform their peers whose parents are highly educated. Hence, these findings reinforce that applying equality of opportunity policies in education regarding equality of opportunity policies in education is efficient.

### 5.3. Further Research Recommendations

This dissertation makes a significant contribution by highlighting that the same pattern of advantage and disadvantage transmission from parents to children described in literature, holds for entrepreneurial outcomes and for the population included in the study. Further research could shed more light on this by applying other measures that are more informative for entrepreneurial success, such as survival period and financial performance indicators. In addition, another research direction would be to survey demographically comparable non-Roma respondents and conclude whether the Roma are facing more “unfair” inequality. Moreover, it would also be relevant to repeat the study for a disadvantaged group in a context where the inequality of opportunity and poverty indicators are relatively low, and insights can be drawn on whether there is a silver lining of being relatively worse off in a context where access to resources is not a major barrier.

Moreover, this dissertation makes a significant contribution by providing evidence for a positive moderating effect of socio-economic background on the relationship between achievement and attribution to effort. The proxy applied for socio-economic background is parental education, as evidence highlights how it is the most impactful indicator of socio-economic background on life outcomes (Erola et al,2016). Further studies could add weight to these findings by including parental income as an indicator of socio-economic background. In addition, it would be relevant to include parental beliefs about the attribution of achievement to effort, parental aspirations for their children, and perceived level of achievement, as these could explain the mechanism behind the moderating effect of parental education. In terms of the generalizability of the findings, it would be relevant to repeat the study on a random, at least nationally representative sample.

Furthermore, this study draws the surprising conclusion that parental education has a significant negative impact on academic performance measured by the intermediary GPA of students at a Dutch university. In addition, the robustness check analysis indicated a significant positive effect of low parental income. A straightforward recommendation for further research is to repeat the research and control for ability. This can be done by including an indicator of previous academic achievement, such as secondary school leaving exam results. This is expected to alter the results. However, at the stage of tertiary education, it is expected that due to the selection process, there will be less variation compared to a sample from mandatory education. Hence, the coefficient might decrease but it is unlikely that the sign will change from negative to positive. In addition, in order to expand the generalizability of findings, observations from other faculties besides Economics and Management, and other universities in the Netherlands should be included. Lastly, data collection should be repeated, to rule out the influence of the COVID-19 pandemic.

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