Family Background and Individual Achievement
- Essays in Empirical Labour Economics

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I think it’s fair to say that my journey towards research started one September afternoon at the library of Stockholm University. I had spent the day reading various economic papers, looking for a question to study in my master thesis. Finally I held a paper in my hand that looked interesting and realized that it was written by someone at Stockholm university. With a vague idea of perhaps doing some follow-up study, I found my way to the corridors of SOFI for the first time. I did not know just how lucky I was to find Anders Björklund actually present in his room. But there he was and when I went out again I had got myself data for my master thesis and an advisor too. Then he enthusiastically walked ahead to the copying room and provided me with some first references. Now, when I have finished writing my doctoral thesis, I think this story is quite representative of Anders. He has followed my work with the thesis, always supporting, very often with that enthusiasm of his, standing in the doorway, stretching his legs and discussing some research issue or the latest seminar. Anders has been generous with his time and shared his views on various matters and I have learnt a lot from talking to him, not least during the time when we wrote the last paper of this thesis together.

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And for you my darling boys, Simon and Lukas, it is hard to express my feelings so I borrow the words of Joan Didion:

I love you more than another day.

Stockholm, October 31st 2008
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Introduction

My main research interest concerns how family background influences people's later outcomes. There is a rich literature in this field, both within economics and other disciplines like sociology and psychology. One question that has received a lot of attention, especially within economics, is the income relation between parents and children, in particular to what degree economic status is passed on from one generation to the next. Also, other variables like education, occupation and crime have been studied within an intergenerational context. The main motive for this kind of research is that it provides a measure of to what degree a society promotes equality of opportunity. It is often argued that high cross-sectional inequality is more acceptable from society’s point of view if it comes together with high intergenerational income mobility. In this case, everyone has a similar chance to finally reach a high income level as an adult, regardless of the parents’ economic status.

A less frequent, but compelling approach to studying the role of family and community background is to use sibling correlations. For example, the sibling correlation in income tells us what fraction of the variation in income that can be attributed to factors that siblings share. These factors are likely to include parental income and other parental influences such as aspirations and cultural inheritance, as well as things not directly experienced in the home, such as school and neighborhood effects. Genetic traits not shared by siblings, differential treatment of siblings, time-dependent changes in neighborhoods, schools, etc. are not
captured by the sibling correlation. If such non-shared factors are relatively more important than shared factors for incomes, the sibling correlation will be low. The more important the effects that siblings share are, the larger is the sibling correlation.1

A sibling correlation can be decomposed into the squared intergenerational elasticity and a second term that captures factors that are uncorrelated with parental income:

(1) Sibling correlation = (intergenerational correlation)² + shared factors uncorrelated with parental income.

What we learn from (1) is that a correlation between siblings is, in fact, a broader measure of the importance of family background and community effects than the parent-offspring association.2 This is mainly due to the simple fact that siblings share much more than their parents’ income. Still, only part of the family and community factors that influence income is shared by siblings. Therefore, the sibling correlation can be viewed as a lower bound on the impact of those factors on income. To sum up, both intergenerational and sibling correlations are practical tools that have been used as summary measures of the impact of family background.

Yet another approach that exploits information on siblings is to use differences between siblings. This is a way to eliminate the effect of all kinds of family and community characteristics that are shared by siblings

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1 In the Nordic countries, the brother correlation in long-run income is about 0.25 see Björklund et al. 2002 for details.
and this method has been used in various studies, see for example Blau (1999).

One typical critique against the use of sibling correlations and sibling differences is that obviously, it does not apply for single-child families. Figure 1 presents an overview of the number of siblings of individuals born in Sweden in 1962-1973. The calculations are based on a sample drawn from Statistic Sweden’s Multi-Generational Register. The sample covers 20% of the Swedish population.

Figure 1a. Number of biological full siblings of individuals born in Sweden in 1962-1973

Figure 1b. Number of siblings and half-siblings of individuals born in Sweden in 1962-1973

Source: The Multi-Generational Register, Statistic Sweden. Category 5 includes 5 or more siblings.

In figure 1a, only full biological siblings are included, i.e. families where some of the siblings are half-siblings, as well as families with adopted children, are excluded from the sample. Here, we see that more than two thirds of the Swedish population in this age group has got one or two biological full siblings while only about three percent of the population has no siblings at all. In figure 1b, the sample includes both biological

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3 The Multi-Generational Register includes all individuals who have received a national registration number in Sweden some time since 1961 and who are born after 1931. See Statistics Sweden (www.scb.se) for more details.
siblings and half-siblings on either parent’s side, but families with adopted children are still excluded. In this case, only about two percent lack both full siblings and half-siblings. So, even though the use of sibling correlations overlooks single-child families, this concerns a rather limited part of the population.

A general finding in the literature concerning the role of family background is that both intergenerational and sibling correlations are smaller in the Nordic countries than in for example the US.\(^4\) Compared to most other countries, the Swedish distribution of disposable income is very compressed due to the high level of taxes and transfers. Also, the majority of all schools and universities are public and free of charge and all together these aspects help to reduce the importance of family background. The US, on the other hand, is at the top of international income inequality rankings among the developed countries.\(^5\) Further, the US school system is primarily based on private schools and tuition fees so the impact of family resources is likely to be much stronger.

What I think is most intriguing about this kind of research is that on the one hand, the questions handled here are of such nature that probably everyone can relate to them. It is of general interest to learn more about the role of family background and it is easy to become committed to these questions. On the other hand, the task of actually being able to show or explain something about the link between family background and future outcome is – as will be discussed in the thesis - quite challenging. Another aspect is that hardly anyone would reject the idea that family background matters, but how much and in what way?


\(^5\) See for example Horrace et al. (2008) for rankings based on the Gini coefficient, the Theil index and the Varlog index using the Luxembourg Income Study (LIS).
And to the extent that parents are important, what is it about the parents that matters? Is it what they do or who they are? What is the role of family structure?

My interest in these questions is reflected in all four papers of the thesis but in various ways. The papers are self-contained, but a main theme throughout the thesis is the focus on siblings. A shortcut to describing the different methods that are used in the thesis is that they involve sibling differences and sibling similarities. In the first paper, I use the sibling-difference approach to study the wage premium from college choice in Sweden. This involves estimating wage-equations where each variable is expressed as deviations from family means. The result of this exercise is that the estimates are adjusted for any bias caused by factors shared by siblings.

In the second paper, I combine two fields of literature, the intergenerational mobility and the birth order literature. Here I study if the income relation between parents and children is affected by birth order and family size. In other words, I estimate the intergenerational income elasticity by number of siblings and birth order position.

In the third paper, I want to learn if the sibling similarity in adult income can be explained by the fact that siblings usually share neighborhoods when they grow up. To address this question, I compare correlations of siblings and neighboring children for a number of different outcome variables. Finally, the last paper makes use of a data set that contains rich information about families in order to further explore what factors can explain why siblings tend to have such similar incomes.

Now follows a few words about the data used in this thesis before I end up with a short summary of each paper. All four papers in the thesis
build on data from Statistics Sweden’s administrative registers. While paper one and two exclusively use register data, paper three and four are based on Stockholm Birth Cohort (SBC) which was created in 2004/2005 by means of a probability matching of two previously existing longitudinal datasets. A major strength of the SBC data base is the combination of comprehensive register data and unusually rich survey data.

The analyses in the first two papers in the thesis are based on samples that are representative of the Swedish population, while the last two papers cover the Stockholm metropolitan area. Clearly, the focus on Stockholm rather than the whole population is a limitation. But already in the 1960s, (when the survey data were collected) the metropolitan area actually covered nearly ¼ of the Swedish population. Further, it is a comforting feature that Raaum et al. (2006) come up with very similar results in their study on a representative Norwegian sample, as those reported in the third paper of this thesis.

Paper I

College Choice and Subsequent Earnings. Results using Swedish Sibling Data

One fundamental part of the Swedish welfare state has been to offer publicly financed higher education. During the second half of the twentieth century, there was a major increase in the accessibility of higher education in Sweden. The government decided to establish new colleges in order to meet the increased demand for higher education and

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many of the new colleges were located to regions where a majority of the inhabitants had limited experiences of higher education.

This paper investigates the relationship between college choice and annual earnings, using an administrative data set on 19,250 Swedish siblings. Friends, parents and other family members might influence the decision to go to a particular college. An advantage with the data is that they allow us to control for unobserved family and neighborhood characteristics that may affect college choices. The analyses are based on observations that have within-family variation in college choice. Several reasons explain why siblings from the same family might choose different colleges. One is that a college was established before one of them made their decision to go to college. Another reason might be that they have different high-school grades. Yet another reason might be that one sibling chooses a different college because of the (low) quality of the college education obtained by another sibling.

The results show that earnings vary significantly between students who graduated from different colleges and between different samples of siblings. The estimated earnings premium is reduced by about a half when family background is accounted for, which means that failing to adjust for family characteristics will overestimate the earnings premium of college type. The difference in earnings premium between colleges is still present, but slightly reduced when area of residence after college education is included in the analyses.
Do Birth Order and Family Size Matter for Intergenerational Income Mobility? Evidence from Sweden

A number of studies have concluded that there is a negative relationship between the number of siblings and performance on the labour market, (see Haveman & Wolf 1993). One view of this phenomenon is that parent’s resources both in terms of time and money are diluted with each and every new child in the family. This is also referred to as the parent’s trade off between child quantity and child quality (see Becker 1992). Another suggestion is that parents who have several children differ from those who have only few children, for example when it comes to income or education level. Anyhow, the negative relationship between family size and future achievement opens up for the possibility that summary measures such as the intergenerational income correlation varies with family size. Also, given the amount of research time and effort spent on intergenerational mobility in various countries, I think it is motivated to view this question in a family structure perspective. In this thesis, I study the intergenerational link further by examining if it is affected by birth order and family size. This paper uses a large sample of individuals born between 1962 and 1964 and income elasticities with respect to parents’ incomes are estimated for individuals with different birth-order positions and family sizes.

The main finding of this paper is that there seems to be birth-order and family-size patterns in the transmission of economic status between fathers and sons. The income elasticity tends to decrease with birth order for a given family size, especially in the labor-income analysis. In large
families, there is a sizable difference in income elasticity between first and last-born sons: in three child families, the estimate for first-born sons is almost twice as large and in four-child families, the estimate for first-born sons is almost three times as large. Disregarding children without siblings, the elasticity also tends to decrease with family size. These differences can not be explained by differences in the age of the fathers at the time the income data are collected and the differences in birth-order and family-size estimates are significant. The estimates for fathers and daughters show a similar but weaker elasticity pattern regarding birth order, but the differences are not significant. In the mother-daughter and mother-son samples, there are no significant birth-order or family-size effects.

Paper III

A Comparison of Family and Neighborhood Effects on Grades, Test Scores, Educational Attainment and Income. Evidence from Sweden

Even though there is an extensive amount of research on family background, we know relatively little about why siblings end up similarly in terms of future achievement. Sibling correlation studies show that fairly large amounts of the variation in for example school grades, education and income can be attributed to family and other background factors. Out of this we can conclude that in general, background factors seem to matter a lot. But what do we know about the background factors that make siblings similar in terms of future achievement? Exactly what is it about the background that matters?
One hypothesis is that because most siblings grow up in the same neighborhood, this could explain parts of the sibling similarity. Solon, Page and Duncan (2000) suggest using neighbor correlations to study the influence of the environment where children grow up. Just like sibling correlations reflect sibling’s shared background factors, correlations between neighboring children show how much of the variation in an outcome variable that can be attributed to neighborhoods. Neighborhood conditions may influence future achievement in many respects. For example, safe physical environments along with solid financial resources in the community may promote children’s development and those are factors that can vary between neighborhoods. How important is the neighborhood compared to family background? This is a question of great concern, both to parents and policymakers and this is also the topic of this paper.

This paper compares sibling and neighborhood correlations in school performance, educational attainment and income as a way to learn if neighborhoods can explain why siblings are similar in terms of future income. It also presents results for an alternative neighborhood measure, namely primary school at both school and class level. Finally, this paper presents results for school grades and test scores at 6th grade as a way to study if neighborhoods perhaps matter more for short-term rather than long-term outcome variables.

The results show that while sibling correlations in education exceeds 0.40 for both men and women, correlations among unrelated neighbors are estimated to less than 0.03 after adjusting for some family background variables. The result of very small neighbor correlations also holds for the other outcome variables. The exception to this is the correlation in test score results among classmates that indicates a class
room effect, especially for males. Still, the overall result of this paper is that neighborhood correlations are very small and in particular they are much smaller than the sibling correlations.

Paper IV

What More than Parental Income? An Exploration of what Swedish Siblings Get from their Parents

This paper argues that given the amount of research on intergenerational mobility and the focus on family background, it is somewhat surprising that relatively little research has been devoted to exploring sibling correlations in income. Sibling correlations are used as overall measures of the impact of family background and community influences on individual outcomes. While most correlation studies show that siblings are quite similar in terms of future achievement, we lack specific knowledge of what it is about family background that really matters. Studies on intergenerational income mobility show that parental income matters to some extent, but they also show that more than half of the family background and community influences that siblings share are not even correlated with parental income. This paper is based on a data set that contains rich information about families in order to explore what factors in addition to parental income can explain why siblings tend to have such similar outcomes.

The results in this paper show that measures of family structure and social problems account for very little of sibling similarities in adult income above and beyond that already accounted for by parental
income. However, when adding a set of indicators for parental involvement and attitudes, the explanatory power of all our variables increased from about a third (using only traditional indicators of socio-economic status) to just over half. Interestingly, indicators of parents' patience, i.e., propensity to plan ahead and willingness to postpone benefits to the future, are particularly important.
References


