First draft, comments welcome.

Do birth order and family size matter for intergenerational income mobility? A study based on Swedish micro data.

Lena Lindahl
Swedish Institute for Social Research
Stockholm University
S-106 91 Stockholm
E-mail: Lena.Lindahl@sofi.su.se

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Abstract

Previous studies of intergenerational income mobility have not considered potential birth-order or family-size effects in the estimated income elasticity. This paper employs a large sample of individuals born in 1962-1964 and exploits differences in these individuals' birth-order positions and family sizes, i.e., the number of siblings. Income elasticities with respect to father's income are estimated for individuals in different birth-order positions for a given family size. Results for sons and daughters based on both labor income and market income are presented. The elasticity tends to decrease with family size as well as with birth order for a given family size, especially in the labor income analysis of fathers and sons.

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1. Introduction

Rising interest in intergenerational income mobility has generated many studies of the relation between the long run income of fathers and sons, and more unusually, of fathers and daughters. The interest in the transmission of economic status from one generation to another is generally motivated by the wish to determine the degree of equality of opportunity. The extensive Swedish welfare system can be interpreted as a decision to promote equal opportunities. For instance, most schools are public and higher education is free of charge which reduces the importance of family background. In this way, studies that examine intergenerational income mobility can be useful as 'equality barometers' in society.

In Sweden the estimated income elasticity is 0.13-0.25 for fathers and sons and slightly lower for fathers and daughters (Björklund and Jäntti 1997, Österberg 2000). In the US the elasticitiy for fathers and sons is around 0.40 and the figure for fathers and daughters is about the same (Solon 1992, Zimmerman 1992, Chadwick and Solon 2002). Still, there is little knowledge about what drives the intergenerational transmission of income. Is it explained by high-income parents spending more resources on their children's education or are the parental characteristics that promoted the parent's own high income passed over to the children? Further, to the extent that parent's income has an impact on the future income of the children, is the impact equivalent for all children in a household? The empirical studies in this area have so far not considered potential birth-order or family-size effects. Similarly, the prevailing birth-order literature has not focused on the intergenerational relation of income. Therefore one may say that studies of intergenerational income mobility provide average income elasticities of individuals from all categories of birth-order positions and family sizes. The task to be dealt with in this study is therefore to combine these literatures and find out whether income elasticities for individuals with different birth-order positions and family sizes differ from the average income elasticity. More specifically, in the first step this paper will provide an average income elasticity similar to the traditional analyses. In the next step it will allow for birth-order and family-size differences and these results are then compared to those in the traditional analysis. Allowing for birth-order and family-size differences will then be one way to learn more about the mechanisms behind the transmission of economic status between generations.

Next section discusses why to expect birth-order and family-size effects. Section 3 provides a short overview of the literature on birth-order and family-size effects. Section 4 presents the econometric framework and discusses different approaches to analyse birth-order and family-size effects. Section 5 describes the data and the sample selection and section 6 presents the empirical results. Section 7 concludes the paper.

2 Why to expect birth-order and family-size effects

To start with the effects of the number of children, high-income earners usually have fewer children and also more resources to spend on each child compared to low-income earners. Studies have also shown that the highest income elasticities between generations are estimated at the top of the parent's income distribution in Sweden (Österberg 2000). This would predict a negative relation between the number of siblings and income elasticity even though the relation depends on the income level rather than family size.[1] Second, a discussion of the significance of parental influence on children produces similar predictions. Children without siblings are more left out to the influence of parents than children with many siblings. Naturally, in larger families the parents have less time to devote to each child. One hypothesis is therefore that the parental influence on children is smaller in families with many children, which may reduce the income elasticity in large families. Then income elasticity would again be expected to decrease with family size and accordingly, children without siblings would be expected to exhibit the highest income elasticity.

Turning to the effects of birth order, there may be differences in the family environment for siblings with different positions in the birth order. For instance, first-born children spend more time alone with the parents by definition, since there initially are no other siblings in the family. It has also been argued that last-borns may have this advantage too (Hanushek 1992), which seems reasonable at least if the age difference is large between the last-born and the previous sibling.

[1] This is of course testable by comparing elasticity within high and low income families.

Second, when the first child is born, many parents are in the beginning of their careers, while the later born children may arrive when the parents are closer to the peak of their careers and earnings profile, especially if there are many children in the household (Behrman and Taubman 1986). This may alter the family environment because of changes in economic status and perhaps because of changes in the amount of time available to spend together.

Third, there is the risk of divorce which may have varying effect on children in different birth-order positions. Separation from the father, which is still the most common outcome, is likely to decrease the father's impact on the children. In the long run the income elasticity between children and absent parents probably decreases. This may result in birth-order differences in income elasticity, especially if there is a large age difference between the siblings. In that case, the youngest sibling is likely be more affected by the separation.

Fourth, Sulloway is a leading debater on the significance of birth order who argues that firstborn children are 'more likely to identify with authority' than the younger siblings.[2] Sociological studies present results in line with this hypothesis, emphasizing the unique experience of firstborns when they enjoyed parent's attention without competition of other siblings. At this time, the parents are likely to be the major source of influence. Sears (1950) summarizes some findings on the relation between ordinal position in the family and dependency on parents. The main finding is that firstborn children tend to be more dependent of the parents than the younger siblings.[3] Clausen (1966) discusses parents' tendency to delegate parts of their authority over younger children to the firstborns. He suggests that firstborns therefore tend to recognize and accept parental authority to a greater extent than later born children do. It has also been argued that since firstborns grow up in an adult-oriented environment they tend to imitate their parents to a larger extent than do their younger siblings (Behrman and Taubman 1986).[4]

Finally, there is the old tradition that 'the eldest son inherits the farm'. This agricultural habit is also common when private companies are inherited within the family. To the extent that this tradition has persisted, in a literal sense or not, it may be reasonable to predict higher income elasticity among first-born children.

[2] Sulloway (1997)
[3] The study was based on surveys posed to parents and teachers.

3. Previous research

Previous studies of birth order and family size have exclusively focused on effects on wage level, education level or schooling performance. Lindert (1977) finds a negative relation in US data between family size and the expected years of schooling. He also finds significant sibling position effects on schooling performance. The results indicate that first borns have an advantage over middle borns in large families. Using US data, Behrman and Taubman (1986) find negative effects of family size on years of schooling. They also find differences by birth order in the effects on years of schooling. First-borns receive more schooling and the effects remain when controlling for family size. The birth-order differences in the effect on earnings, on the other hand, become insignificant when controlling for family size. Kessler (1991) finds neither significant birth-order nor childhood family-size effects on the level or growth of wages in US data. Hanushek (1992) finds positive effects of being first born on schooling performance in US data, but this effect is found to be entirely explained by the first borns' higher probability of belonging to small families. The study confirms earlier findings that schooling achievement falls with increased family size. Björklund and Jäntti (1998) find that children from large families in Sweden, Finland and the US can expect to earn less than children from small families. Finally, Raaum and Aabo (2001) find that first-borns obtain more education than their siblings, measured in years of schooling. Overall, these findings point at the importance of integrating the birth-order analysis with the family-size analysis in order to avoid confounding birth-order effects with family-size effects.

4. Empirical framework

4.1 Estimating income elasticity

A traditional theoretical model of the relation between parent's and children's income is shown in equation 1:

(1) $Y_{ci} = a + b\,Y_{pi} + e_i$

[4] Behrman and Taubman point out that these kinds of arguments date back to Galton (1874).

where Y_{ci} is long run log income of child c in family i, Y_{pi} is long run log income of a parent p in family i and $å_i$ is a random component distributed as $N(0, s^2)$. b measures the elasticity of the children's income with respect to the parents' income. Consequently, (1-b) refers to the degree of income mobility. Generally, values of â between 0 and 1 indicate that the expected deviation from the mean income decreases. If b equals 1, then fathers that belong to the x^{th} percentile of the father's income distribution will raise sons who end up in the x^{th} percentile of the son's income distribution. If the children's income has the same variance as the parent's income, b also equals the intergenerational correlation. If the variances differ, correlations can be obtained by multiplying the elasticity coefficient by the ratio of the standard deviations of parents' and children's incomes.

The income measure of the model, long run income, is unobserved in the data. Naturally income averages taken over several years produce a better measure of long run income than do single year measures of income, since the impact of transitory changes is smaller (Solon 1992). In order to approach the theoretical model in equation 1, the income variable used is the average of the incomes in 1970, 1975, 1980, 1985 and 1990 for the fathers. For the children, average income from 1993 and 1996 is used.

In practice, parent's income is usually measured later in the life cycle compared to the children, due to data limitations. Therefore age controls are used in estimation to adjust for both generations' lifecycle variation in income:

$$(2) \quad \overline{Y}_{ci} = b_0 + b_1 \overline{Y}_{pi} + b_2 A_{ci} + b_3 A_{ci}^2 + b_4 \overline{A}_{pi} + b_5 \overline{A}_{pi}^2 + e_i,$$

$\overline{Y}_{ci} = \sum Y_{ci} / 2$ is the two year average of children's log income and $\overline{Y}_{pi} = \sum Y_{pi} / 5$ is the five year average of parent's log income. $\overline{A}_{ci}$ is the children's average age over the years income data were collected and $\overline{A}_{ci}^2$ is the average of the children's squared age over those years. $\overline{A}_{pi}$ and $\overline{A}_{pi}^2$ are the corresponding variables for the parents. In the present study, parents are represented by the fathers and the age variables for children are not included since the children are of very similar ages in all the samples.

4.2 Allowing for birth-order and family-size effects

There are several ways to allow for birth-order effects and the challenge is to make the most accurate comparison. One alternative is to make a within family analysis, that is to estimate the elasticity of firstborns and compare it to the elasticity of their younger siblings. By definition one drawback with this approach is that there will be age differences between the siblings. It has been found that intergenerational income elasticity tends to rise with age in general (Reville 1995) therefore it is of benefit if the individuals are of similar ages at the time the income data are collected. One way to solve this problem is to drop the within family approach and use a cross section framework instead. That is, choose a cohort of individuals of equal age and exploit differences in their birth-order positions and family sizes. In that way, income data can be collected when the individuals are of the same age. The cross section framework is applied in this analysis.

5. Data and sample selection

The data used in this study are entirely based on administrative records kept by Statistics Sweden. The dataset consists of a random sample covering 20 percent of the population born in Sweden between 1962 and 1973 and amounts to about 250 000 individuals. All siblings of these individuals are located in the second generation register and will be denoted 'siblings sample'. In the data, full siblings, half siblings and adopted children can be identified, but only full siblings are included in this analysis. Income data of all siblings come from registers based on employers' compulsory reports to tax authorities and cover the years 1990, 1993, 1996 and 1999. Some information about the individuals' parents, such as date of birth and income, are collected from the censuses of 1970, 1975, 1980, 1985 and 1990. The income variables are labor income, including annual earnings, sickness benefits, parents' allowance and income from farming activity; and market income that includes labor income but also pensions, unemployment benefits, capital market income (including capital gains) and income from real estate property (*inkomst av annan fastighet*).[5]

[5] The market income variable for parents in 1970 differs slightly from the other years, (to be explained.)

The analysis is based on individuals both from the random sample and the siblings sample[6] that are born in Sweden between 1962 and 1964. Average income of the individuals in the random sample does not deviate much from the average income of the individuals in the siblings sample (232 459 SEK compared to 232 177 SEK). Some information such as income and date of birth of the biological fathers of all individuals are then added to the sample.

A few restrictions are imposed on the samples used in estimation: An age restriction on the fathers is applied, including cohorts born 1925 and later, which yields an upper age limit of 65 years in 1990. The reason to exclude fathers who are older than 65 is the wish to measure father's income at a time when the children are most likely to be affected by it. Children are probably most influenced by their parent's income while they live with their parents and at that time most parents are likely to be younger than 65. The fathers are also required to be alive in 1990, which is the last point in time that the father's income data are collected. These restrictions leave us with a sample of 40 428 father and son pairs and a sample of 38 391 father and daughter pairs. By definition, income has to be positive in order to estimate the income elasticity. An income restriction that requires positive average income for both generations, i.e., positive income has to be reported in at least one of the income years, leaves us with 38 384 father and son pairs and 36 635 father and daugther pairs.

Given this base line income restriction, the question is whether the restriction should go further. There is a trade-off between achieving a good measure of longrun income – which is promoted by including as many observations on income per individual as possible – and avoid imposing selection on the sample. The first alternative suggests that only individuals that report positive income in all income years should be included. But then selection bias may arise since those who have experienced unemployment are dropped. Since it is more common that low income earners become unemployed, the average income in the sample will increase. This, in turn, may alter the estimated income elasticity since studies show that high income earners tend to have higher income elasticity (Österberg 2000). Oversampling high-income earners may also alter the analysis of family-size effects since they tend to have fewer children. Therefore the stricter income restriction is likely to impose positive selection on the sample. It is hard to tell which restriction produces the least biased estimate. Previous

[6] This means that an individual that does not belong to the random sample may be included in the analysis on the grounds that he or she is a sibling to someone in the random sample, even if the individual in the random

studies have mainly used the stricter income restiriction, including only individuals with positive income in all income years. Österberg (2000) tried both alternatives and the estimates were slightly higher in the regressions that included only individuals with positive income in all income years. This study will follow Österberg and apply two alternative income restrictions.

In order to control for birth-order and family-size effects, the individuals in the sample are divided into subsamples of children without siblings, first-borns in families of two children, last-borns in families of two children etc., all the way up to families of four or more children. Previous studies have shown large differences in son's and daughter's income elasticity, therefore all analyses will be made separately for brothers and sisters. Table 1 presents averages of labor income for sons with positive income in at least one year. The pooled sample of 38 384 observations refers to all sons born between 1962-1964 that remain after the imposed restrictions.[7] Average annual income is 232 177 SEK (about 24 000 EURO). Income averages according to birth order and family size show that the average income decreases with family size and for a given family size it also decreases with birth order. The same pattern occurs for market income, presented in table 2. (Income averages for daughters in appendix.) Characteristics for fathers finally, are presented in table 3.

6. Empirical results

6.1 Results in traditional analysis

Table 4 presents regression coefficients from the estimation of intergeneratonal income elasticity in its traditional form. The dependent variable is the son's/daughter's log income, averaged over the years 1996 and 1999. Father's income is a five-year average of log income. The regressions also include age and age-squared for fathers and a constant.[8] For fathers and sons an income elasticity of .293 is estimated in the regression based on labor income where positive income is required in at least one year. This result is slightly higher than what has

sample is born after 1964, that is outside the birth interval included in this analysis.

[7] About 58 % of the observations in this sample belong to the original random sample and 42% are siblings of individuals in the random sample.

[8] Usually, age variables for sons are also included, in order to control for differences in life cycle for the two generations, but in this case there is hardly any point to do that since the sons are almost of the same age. (Average age in all sub-samples is 36 years in 1999)

been found before (.15-.25), something that may be explained by a cohort effect. The individuals in this sample are born in the 1960s while the individuals in previous studies were born mainly in the 1940s and 1950s. Contrary to what may be expected, the stricter requirement of positive income in all years produces a smaller estimate for labor income, while the choice of restriction does not matter for market income. It is also shown that the income relation is stronger for labor income than for market income.

For fathers and daughters an income elasticity of .205 is estimated in the regression based on labor income where positive income is required in at least one year. This estimate is considerably higher than in Österberg's study where the comparable estimate is .076 Similarly as for fathers and sons, the income relation is stronger for labor income than for market income. For both labor and market income, it does not matter much which income restriction is used.

6.2 Results in birth-order and family-size analysis

Table 5 presents regression coefficients from estimation of intergeneratonal income elasticity by birth order and family size for fathers and sons. The dependent variable in each estimation is the son's log labor income, averaged over the years 1996 and 1999. Father's income is a five-year average of log labor income and both sons and fathers must have had positive labor income in at least one year. The regressions also include age and age-squared for fathers and a constant. In the first column and the first row, the estimate for sons without siblings is showed (.319) and in first column and the second row, the estimate for first born sons in families of two children is shown (.315) etc.[9] The overall tendency is that the elasticity decreases with birth order for a given family size even though the differences in birth-order effects are smaller in larger families. The rightmost column provides estimates for the family-size effect without the impact of birth-order effects. Individuals that belong to families of more than three siblings have weaker relations to the fathers income than individuals with fewer siblings.[10] The estimates in families with four and five or more

[9] Note that sex composition does not matter here, for instance, first-born sons may have either younger sisters or younger brothers.

[10] An alternative analysis to control for birth-order effects is performed based on intrafamily samples, where the estimated intergenerational income elasticity of first-borns is compared to the elasticity of their own younger siblings. The results are similar to those presented here, the income elasticity of first-born sons is .220 while the elasticity of their three years younger brothers is .171. The reason to choose three years younger siblings is that income data is available with three-year intervals. The income of first-borns and younger siblings

children are .23 and .22 which may be compared to the average elasticity of .293 in table 4. Hence, the elasticity in the largers families is only about 75% of the average elasticity in the whole sample.

Table 6 shows results from regressions where sons and fathers are required to have had positive income in all income years. The estimates are slightly lower compared to table 4 and the difference in elasticity between first and last born children in families of two children is reduced by around two percentage points. The family-size estimates in the rightmost column still indicates lower income elasticity in for individuals in large families. Table 7 presents results based on market income for fathers and sons. Since market income also includes unemployment benefit, individuals who have experienced unemployment are included in this analysis.[11] Here, nearly all birth-order differences have disappeared, only the estimates of last-borns in families of three and five or more children are still notably small. The trend of elasticity decreasing with family size that was seen in the previous tables is weaker but still, the estimates are smaller within large families. Finally, table 8 shows results from regressions where fathers and sons are required to have had positive income in all income years. The results are much the same as in table 7.

Similar patterns are found in the analysis of fathers and daughters, only the elasticity differences by family size and birth order are less pronounced. Results for fathers and daughters are reported in appendix.

6.3 Sensitivity analysis

To be written:

- Effects of family size and birth order in low and high-income families.
- Separate analysis of the self-employed.

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are then collected at the same point in time, that is, the income for the younger brothers are collected three years later. This analysis is less precise concerning birth-order since siblings who are three years younger than the first-born may be number 2, 3 or 4 in the birth-order.

[11] In the labor income analysis, individuals who have experienced unemployment are included as long as positive income is reported in at least one of the income years, according to the less strict income restriction. When the stricter income restriction is applied, individuals who are unemployed in any of the income years are excluded.

7. Conclusion

The main finding of this paper is that there seems to be patterns in the transmission of economic status between fathers and children. The income elasticity tends to decrease with family size as well as with birth order for a given family size, especially in the labor income analysis of fathers and sons. The results are in line with some of the predicted birth-order and family-size effects that were suggested in section 2. For instance there is the assumption that children from small families are more influenced by the parents than are children from large families, which may lead to stronger income relations within small families. The results are also in line with the hypothesis that that the younger children may look at older siblings as roll-models and be influenced by them, which may generate weaker income relations to the parents compared to first-borns or only children. However, the prediction that first-borns should deviate from the other siblings is not fulfilled, it is rather last-born children who deviate from the other siblings. For last-born children in large families, the elasticity is insignificantly different from zero in most specifications.

It remains for future research to find out whether these results can be replicated with other data sets and decide which are the central mechanisms that determine the intergenerational association in economic status.

Table 1 Son's average annual labor income over years 1996 and 1999. (1000 SEK)

Variable	Mean	St. dev.	Min.	Max	N
Pooled sample	232	135	0	6 285	38 384
Income by birth order and family size:					
Sons without siblings	233	123	0	1 871	1 317
Sons from families of two siblings	239	132	0	3 023	15 670
1st	243	137	0	3 023	10 559
2nd	231	120	.1	2 502	5 109
Sons from families of three siblings	235	146	.1	6 285	13 459
1st	240	147	.1	6 285	6 241
2nd	232	155	.3	6 139	5 149
3rd	227	113	.1	1 734	2 066
Sons from families of four siblings	221	128	.1	2 941	5 300
1st	228	143	0	2 941	1 650
2nd	217	109	.1	1 128	1 610
3rd	220	136	.1	2 745	1 412
4th	215	108	0	935	624
Sons from families of five or more siblings	200	104	.4	1 464	2637
1st	206	120	.7	1 464	440
2nd	205	100	.4	714	493
3rd	198	102	.7	773	557
4th	203	108	.5	1 116	564
5th or higher order	191	93	.5	673	578

Note: The share of only children is smaller than the share in the Swedish population due to the sampling procedure of Statistics Sweden. In random draws based on individuals (rather than households), large families will be over-represented. Also the large amount of firstborns is due to the original sample structure, see explanation in appendix, (to be written).

Table 2. Son's average annual market income over years 1996 and 1999. (1000 SEK)

Variable	Mean	St. dev.	Min.	Max.	N
Pooled sample	247	305	0	44 417	39 317
Income by birth order and family size:					
Sons without siblings	248	155	0	2 852	1 357
Sons from families of two siblings	255	392	0	44 417	16 018
1st	256	190	0	8 604	10 804
2nd	252	630	.1	44 417	5 214
Sons from families of three siblings	250	264	0	20 556	13 761
1st	257	336	0	20 556	6 400
2nd	246	180	.1	6 373	5 247
3rd	242	173	0	3 901	2 114
Sons from families of four siblings	236	177	0	5 177	5 440
1st	239	189	0	4 077	1 699
2nd	228	121	.1	2 061	1 657
3rd	235	147	.3	2 552	1 444
4th	250	291	.2	5 177	640
Sons from families of five or more siblings	209	99	0	1 421	2 741
1st	216	114	5.0	1 421	454
2nd	214	102	.5	991	516
3rd	207	97	0	827	585
4th	211	100	.2	1 116	584
5th or higher order	201	81	.5	6 723	602

Note: The share of only children is smaller than the share in the Swedish population due to the sampling procedure of Statistics Sweden. In random draws based on individuals (rather than households), large families will be over-represented. Also the large amount of firstborns is due to the original sample structure, see explanation in appendix, (to be written).

Table 3. Characteristics of fathers

Variable	Mean	St. dev.	Min.	Max	N
Pooled sample:					
Income	237	236	.6	26 206	38 381
Age in 1980	45.0	.004	0	55.0	38 381
Income by number of children:					
Fathers of one child	223	107	10	11 985	1 318
Fathers of two children	241	325	.6	26 206	15 668
Fathers of three children	244	153	4	6 446	13 458
Fathers of four children	232	155	13	4 582	5 300
Fathers of five or more children	195	101	13	1 113	2 637

Note: Income measure: average annual labor income over years 1970, 1975, (1980), 1985 and 1990. (SEK)

Table 4. Traditional analysis of intergenerational income mobility

Variable	Labor income	Market income
	Fathers and sons	
Positive income in at least one year	.293 (.009) *38 383*	.268 (.008) *39 316*
Positive income in all years	.275 (.009) *31 404*	.269 (.008) *36 340*
	Fathers and daughters	
Positive income in at least one year	.205 (.009) *36 634*	.159 (.008) *37 418*
Positive income in all years	.201 (.010) *29 653*	.163 (.008) *34 584*

Table 5. Estimated intergenerational elasticities in labor income for sons born in 1962-1964, positive income in at least one year required.

# siblings in family	Birth order					
	1	2	3	4	5+	All
1	.319					.319
	(.050)					(.050)
	1 317					*1 317*
2	.315	.259				.298
	(.018)	(.024)				(.014)
	10 559	*5 109*				*15 668*
3	.360	.311	.159			.304
	(.022)	(.022)	(.032)			(.014)
	6 241	*5 149*	*2 066*			*13 456*
4	.279	.256	.236	.064		.233
	(.044)	(.041)	(.040)	(.068)		(.023)
	1 650	*1 610*	*1 412*	*624*		*5 299*
5+	.307	.236	.292	.308	.035	.223
	(.074)	(.069)	(.059)	(.068)	(.058)	(.029)
	440	*493*	*557*	*564*	*578*	*2 336*

Standard errors in parentheses. Sample sizes in italics. The measure of income is log labor income (annual wages before taxes, sickness benefit, parental allowance, income from farming activity) averaged over five years for fathers (1970, 75, (80), 85 and 90) and averaged over two years for sons (1996 and 99).

Table 6. Estimated intergenerational elasticities in labor income for sons born in 1962-1964, positive income in all years required.

# siblings in family	Birth order					
	1	2	3	4	5+	All
1	.281					.281
	(.061)					(.061)
	1 055					*1 055*
2	.278	.244				.267
	(.018)	(.024)				(.015)
	9 062	*4 125*				*13 188*
3	.359	.306	.156			.302
	(.023)	(.023)	(.033)			(.015)
	5 380	*4 229*	*1 570*			*11 181*
4	.290	.264	.184	.080		.226
	(.047)	(.040)	(.042)	(.071)		(.023)
	1 368	*1 277*	*1 084*	*426*		*4 158*
5+	.219	.242	.242	.215	.005	.182
	(.093)	(.067)	(.068)	(.081)	(.070)	(.033)
	340	*369*	*411*	*379*	*315*	*1 818*

Standard errors in parentheses. Sample sizes in italics. The measure of income is log labor income (annual wages before taxes, sickness benefit, parental allowance, income from farming activity) averaged over five years for fathers (1970, 75, (80), 85 and 90) and averaged over two years for sons (1996 and 99).

Table 7. Estimated intergenerational elasticities in market income for sons born in 1962-1964, positive income in at least one year required.

# siblings in family	Birth order					
	1	2	3	4	5+	All
1	.329					.329
	(.048)					(.048)
	1 356					*1 356*
2	.263	.260				.265
	(.016)	(.021)				(.013)
	10 803	*5 213*				*16 017*
3	.300	.287	.172			.273
	(.021)	(.020)	(.032)			(.013)
	6 399	*5 246*	*2 113*			*13 760*
4	.184	.212	.246	.263		.222
	(.036)	(.039)	(.032)	(.050)		(.019)
	1 698	*1 656*	*1 443*	*639*		*5 439*
5+	.252	.263	.241	.313	.112	.238
	(.056)	(.063)	(.059)	(.057)	(.052)	(.026)
	453	*515*	*584*	*583*	*601*	*2 740*

Standard errors in parentheses. Sample sizes in italics. The measure of income is log labor income (annual wages before taxes, sickness benefit, parental allowance, income from farming activity) averaged over five years for fathers (1970, 75, (80), 85 and 90) and averaged over two years for sons (1996 and 99).

Table 8. Estimated intergenerational elasticities in market income for sons born in 1962-1964, positive income in all years required.

# siblings in family	Birth order					
	1	2	3	4	5+	All
1	.355					.355
	(.048)					(.048)
	1 275					*1 275*
2	.267	.249				.263
	(.016)	(.020)				(.013)
	10 976	*4 868*				*14 945*
3	.286	.290	.216			.278
	(.021)	(.020)	(.030)			(.013)
	5 953	*4 855*	*1 954*			*12 764*
4	.178	.231	.274	.228		.228
	(.033)	(.038)	(.033)	(.041)		(.018)
	1 558	*1 499*	*1 310*	*588*		*4 958*
5+	.326	.251	.216	.256	.010	.210
	(.068)	(.064)	(.048)	(.059)	(.046)	(.033)
	395	*449*	*525*	*508*	*513*	*1 424*

Standard errors in parentheses. Sample sizes in italics. The measure of income is log labor income (annual wages before taxes, sickness benefit, parental allowance, income from farming activity) averaged over five years for fathers (1970, 75, (80), 85 and 90) and averaged over two years for sons (1996 and 99).

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Appendix

Table A1. Daughter's average annual labor income over years 1996 and 1999. (SEK)

Variable	Mean	St. dev.	Min.	Max	N
Pooled sample	151	79	0	2 103	36 635
Income by birth order and family size:					
Daughters without siblings	158	85	0	779	1 252
Daughters from families of two siblings	155	80	0	2 103	14 992
1st	157	79	0	1 006	10 169
2nd	151	80	.2	2 103	4 823
Daughters from families of three siblings	151	82	.5	1 704	12 805
1st	158	82	.5	1 210	5 963
2nd	150	79	.1	936	4 750
3rd	147	88	.3	1 704	2 092
Daughters from families of four siblings	143	73	0	801	4 900
1st	143	74	.1	517	1 447
2nd	144	75	.6	801	1 500
3rd	142	72	.1	550	1 350
4th	144	72	0	530	603
Daughters from families of five or more siblings	131	70	.1	694	2686
1st	140	72	.6	636	453
2nd	134	69	.4	420	510
3rd	130	72	.5	694	580
4th	130	72	.1	557	558
5th or higher order	124	64	2	370	585

Note: The share of only children is smaller than the share in the Swedish population due to the sampling procedure of Statistics Sweden. In random draws based on individuals (rather than households), large families will be over-represented. Also the large amount of firstborns is due to the original sample structure, see explanation in appendix, (to be written).

Table A2. Estimated intergenerational elasticities in labor income for daughters born in 1962-1964, positive income in at least one year required.

siblings

in family	Birth order					
	1	2	3	4	5+	All
1	.146 (.055) *1 251*					.146 (.055) *1 251*
2	.214 (.019) *10 168*	.166 (.026) *4 822*				.200 (.015) *14 991*
3	.207 (.024) *5 963*	.209 (.025) *4 749*	.122 (.034) *2 091*			.195 (.015) *12 804*
4	.117 (.048) *1 446*	.202 (.039) *1 499*	.209 (.040) *1 349*	.260 (.061) *602*		.195 (.023) *4 899*
5+	.127 (.067) *452*	.209 (.070) *509*	.195 (.059) *579*	.175 (.082) *557*	.072 (.061) *584*	.163 (.030) *2 685*

Standard errors in parentheses. Sample sizes in italics. The measure of income is log labor income (annual wages before taxes, sickness benefit, parental allowance, income from farming activity) averaged over five years for fathers (1970, 75, (80), 85 and 90) and averaged over two years for daughters (1996 and 99).

Table A3. Estimated intergenerational elasticities in labor income for daughters born in 1962-1964, positive income in all years required.

# siblings in family	Birth order					
	1	2	3	4	5+	All
1	.140 (.043) *1 035*					.140 (.043) *1 035*
2	.183 (.014) *8 643*	.161 (.021) *3 879*				.176 (.012) *12 523*
3	.189 (.017) *5 037*	.181 (.018) *3 874*	.167 (.030) *1 559*			.184 (.012) *10 472*
4	.202 (.034) *1 199*	.166 (.032) *1 177*	.163 (.032) *1 019*	.125 (.053) *399*		.173 (.017) *3 797*
5+	.190 (.065) *350*	.116 (.064) *381*	.112 (.043) *406*	.052 (.061) *364*	.073 (.047) *317*	.111 (.024) *1 822*

Standard errors in parentheses. Sample sizes in italics. The measure of income is log labor income (annual wages before taxes, sickness benefit, parental allowance, income from farming activity) averaged over five years for fathers (1970, 75, (80), 85 and 90) and averaged over two years for daughters (1996 and 99).

Table A4. Estimated intergenerational elasticities in market income for daughters born in 1962-1964, positive income in at least one year required.

# siblings in family	Birth order					
	1	2	3	4	5+	All
1	.193 (.048) *1 277*					.193 (.048) *1 277*
2	.165 (.017) *10 347*	.148 (.023) *4 931*				.161 (.014) *15 279*
3	.159 (.020) *6 091*	.140 (.022) *4 938*	.119 (.031) *2 133*			.147 (.014) *13 064*
4	.105 (.040) *1 477*	.110 (.038) *1 531*	.177 (.033) *1 386*	.127 (.061) *616*		.131 (.020) *5 013*
5+	.188 (.065) *467*	.232 (.063) *531*	.229 (.064) *597*	.151 (.069) *580*	.006 (.054) *602*	.155 (.028) *2 781*

Standard errors in parentheses. Sample sizes in italics.

Table A5. Estimated intergenerational elasticities in market income for daughters born in 1962-1964, positive income in all years required.

# siblings in family	Birth order					
	1	2	3	4	5+	All
1	.134 (.045) *1 207*					.134 (.045) *1 207*
2	.169 (.017) *9 647*	.137 (.023) *4 626*				.159 (.013) *14 274*
3	.176 (.019) *5 615*	.166 (.020) *4 498*	.158 (.031) *1 965*			.172 (.013) *12 080*
4	.156 (.035) *1 353*	.109 (.033) *1 391*	.142 (.034) *1 261*	.078 (.054) *570*		.129 (.018) *4 578*
5+	.233 (.073) *407*	.155 (.060) *467*	.119 (.050) *526*	.097 (.070) *516*	.058 (.053) *521*	.129 (.027) *2 441*

Standard errors in parentheses. Sample sizes in italics.