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Abstract: The similarity in income among siblings is a measure of the omnibus effect of family and community background on income. We estimate sibling similarity in income taking a life course perspective. We employ high-quality Swedish register data that allow us not only to look at the variation in sibling similarity over the life course but also to estimate sibling resemblance in income accumulated over the whole life course. Our findings show that sibling similarity in accumulated income is higher than sibling similarity in income at any specific age. Sibling similarity in accumulated income is largely stable over the life course. It is lower for sisters than for brothers, but differences diminish across cohorts. We also find largely the same amount of sibling similarity in accumulated income in socioeconomically advantaged and in socioeconomically disadvantaged families. We conclude that previous research underestimated the intergenerational persistence of income by focusing on non-accumulated measures. Our study shows that intergenerational income mobility is lower than previously assumed, even in a society with universal, free education and low income inequality.

Keywords: family background, income, intergenerational mobility, quantitative methods, siblings

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Increases in income inequality in Western societies in recent decades (Atkinson and Piketty 2010; Piketty 2013) have increased public and scientific interest in the question of how much economic inequality is transmitted across generations. A large body of literature on intergenerational income mobility studies the association between parental and offspring income (Björklund and Jäntti 2000; Chetty et al. 2014; Mazumder 2005; Torche 2015a). This literature normally employs measures of income taken at one period of a respondent's life course and relates these to the income of the individual's parents, which was measured at only one period of the parents' life courses.

This standard practice in research on income mobility does not measure what mobility researchers are actually interested in capturing: the persistence of lifetime income across generations. Economists have long been aware that permanent income is a better predictor for consumption than current income (Bhalla 1980; Friedman 1957; Modigliani and Brumberg 1954). For that reason, we should also be more interested in the transmission of lifetime income across generations than in the transmission of income specific to a period of the life course.

We address this shortcoming in the literature by looking at sibling similarity in income accumulated over the whole life course. We estimate the total income over an entire working career by accumulating yearly measures of income from age 18 to 60. This approach is an improvement over other approaches to measure income, as it includes both periods with low earnings (e.g., as students) and periods with high earnings (steep career trajectories in some groups). It also captures income volatility, career breaks for parental leave, and life course expectations of income (e.g., young individuals may take loans for housing or education based on expected future earnings).

Our accumulated income approach is similar to taking the average income from ages 18 and 60 (though we think it makes more sense to conceptualize it as the life course accumulation of income), and is very close to the concept of permanent income. However, many studies

measure permanent income taking the average of fewer years (e.g., Brady et al. 2017). We relate to this literature by estimating how well we can proxy accumulated income using shorter observation periods.

We measure income using both measures of earnings and measures of disposable income. Earnings are a measure of human capital. Disposable income measures the amount of money that is available for consumption. Disposable income importantly includes transfers that smooth out the effect of many life course events such as parenthood and unemployment. We believe both concepts to be of importance to the mobility literature and compare our results across them.

We employ the similarity between siblings as our measure of intergenerational income mobility.[1] We thereby follow a large tradition in the literature that has employed this approach (Björklund and Jäntti 2012; Björklund, Jäntti, and Lindquist 2009; Hauser and Mossel 1985; Hauser and Sewell 1986; Jencks et al. 1979; Jencks et al. 1972; Mazumder 2008, 2011; Schnitzlein 2014; Solon et al. 1991). Applying this approach to the study of intergenerational income mobility has several advantages. In particular, this approach makes it possible to consider both measured and unmeasured aspects of family and community background, as we account for all factors that are shared equally among siblings when addressing the intergenerational transmission of income. Therefore, this approach provides an omnibus measure of the total effect of family and community background on income, even though this may still be a lower bound estimate as siblings can experience the same family differently (Björklund and Jäntti 2012; Conley 2004).

We study gender differences by looking at both brother and sister correlations. Research on income mobility focuses often on brother correlations (e.g., Bingley and Cappellari 2018; Björklund et al. 2009). We have high-quality data that also allow us to study sister correlations in income. In our view, there is no reason why we should limit our analysis to only half of the

population (Acker 1973). Women may have a lower attachment to the labor market than men but this is less true for the cohorts of women in Sweden that we analyze. Sweden also has an individual-level tax system, which makes individual income an important outcome.

We also analyze differences in sibling similarity by family socioeconomic background (Conley 2004, 2008; Conley and Glauber 2008). The estimation of sibling similarity at the population-level assumes, per definition, that the similarity of siblings does not vary across subpopulations within a society. Estimating sibling correlations restricted to subpopulations relaxes this assumption. In addition, economic theories have predicted variation in sibling similarity across social groups (Becker and Tomes 1976; Behrman, Pollak, and Taubman 1982; Conley 2004, 2008; Griliches 1979). Previous research tested for socioeconomic differences in cousin correlations in Sweden (Hällsten 2014). We expand these analyses to socioeconomic differences in sibling resemblance in Sweden. This allows us to test whether the socioeconomic differences found by Conley (2008) and Conley and Glauber (2008) are unique to the United States or whether they also emerge in other countries.

Sweden is an interesting case for the study of intergenerational income mobility. According to Esping-Andersen's (1990, 1999) famous typology, Sweden is a Scandinavian social democratic welfare regime. In addition, income inequality is lower in Sweden than in other advanced, industrialized societies. Comparative research has also argued that income mobility is rather high in Sweden compared to non-Scandinavian countries (Björklund et al. 2002; Björklund and Jäntti 1997; Blanden 2013; Bratberg et al. 2017; Corak 2011; Solon 2002). For these reasons, the level of intergenerational income mobility that we observe in Sweden is likely to be lower than in most other advanced, industrialized societies. The issues we identify in our study are therefore likely to be rather more than less consequential for the study of intergenerational income mobility in these societies than in Sweden. For instance, we find it plausible that our approach applied to the United States would result in estimates of sibling

similarity in earnings that would be higher than those obtained in previous research (Mazumder 2008, 2011; Schnitzlein 2014; Solon et al. 1991).

BACKGROUND AND THEORETICAL CONSIDERATIONS

Sibling Similarity as a Measure of Intergenerational Mobility

Most research on intergenerational income mobility relates parental to offspring income (Björklund and Jäntti 2000; Chetty et al. 2014; Mazumder 2005; Torche 2015a). This approach, however, underestimates the intergenerational transmission of advantage as other family background factors than parental income do also influence offspring's income. For instance, Mood (2017) showed, using, as we do, high-quality data from Swedish registers, that parental education and occupation affected children's earnings alongside parental income. In addition, many aspects of family background that affect children's income are likely to be unobserved, for instance, parental cognitive and noncognitive skills that are also transmitted across generations and parental motivation to foster the development of these skills in their offspring.

To take into account both unobserved and observed aspects of family background that affect income, researchers developed an approach that employs the similarity between siblings as a broader measures of the effect of family background on income (Björklund and Jäntti 2012; Björklund, Jäntti, and Lindquist 2009; Hauser and Mossel 1985; Hauser and Sewell 1986; Jencks et al. 1979; Jencks et al. 1972; Mazumder 2008, 2011; Schnitzlein 2014; Solon et al. 1991). The motivation behind this approach is the insight that siblings share many more characteristics than can be taken considered through observable measures of social origin. Siblings grow up together, so they share most parental resources. For instance, siblings experience nearly the same educational environment within the family. In addition, siblings share the same neighborhood in which they grow up and often attend the same school. All aspects of family background that are constant and shared between siblings are included in the

measure of the omnibus effect of family and community background provided by a sibling correlation.

Even though siblings grow up together, there are some aspects of the family environment that they may experience differently. For instance, previous research has shown that birth order can affect children's educational outcomes and their income (e.g., Kantarevic and Mechoulan 2006). These sibling-specific effects are not considered by sibling correlations, which is why they may only provide lower bound estimates of the total effect of family background (Björklund and Jäntti 2012). However, corrections by Björklund and Jäntti (2012) did not considerably change sibling correlations. Therefore, the bias introduced by omitting sibling-specific family background factors may be small.

In addition to this limitation of the sibling resemblance approach, several concerns that are more fundamental have been raised against using the similarity between siblings as a measure of intergenerational mobility. Sibling correlations have been criticized for mixing different types of effects together, including the influences of different parental resources, parenting, and influences from neighborhoods, siblings, and peers (Breen and Jonsson 2005). We, however, see this as an advantage of sibling correlations. It is precisely because of their summative nature that sibling correlations provide such a good measure of the omnibus effect of family and community background. Our study is only interested in estimating how much the shared aspects of siblings' upbringing affect their life chances, as well as how this changes over the life course and not in decomposing this total effect into different components.

Another concern is that sibling correlations are, by definition, estimated on a selective sample, as singletons do not contribute to their estimation (Breen and Jonsson 2005). The consequences of focusing on siblings to estimate intergenerational mobility are not clear. In the country and for the cohorts that we analyze, singletons are quite rare so that, even if our estimates of intergenerational mobility are not generalizable to singletons, we still cover by far

the largest part of the population (less than 7% of children born in 1960 had no siblings). In addition, Lindahl (2008) found no differences in intergenerational mobility between families with one child and families with more children in Sweden. The estimation of brother and sister correlations relies on men and women who have a same-sex sibling. Approximately two-thirds of the population have at least one same-sex sibling in the cohorts covered by our study.[2]

Sibling Similarity in Income over the Life Course: Accumulated and Non-Accumulated Measures of Income

There are both methodological and substantive reasons to study how intergenerational income mobility (e.g., sibling similarity in income) varies over the life course. On a theoretical level, we believe that, from the perspective of theories of intergenerational mobility, we should be more interested in accumulated income as an outcome of the mobility process than in income at specific ages. This is in line with ideas expressed by economists that we should look at permanent rather than current income, as people base their consumption on the former (Bhalla 1980; Friedman 1957; Modigliani and Brumberg 1954). If the impact of social background varies over the life course, this is relevant for our understanding of social mobility and inequality.

On a methodological level, economists have identified several major, life course-related challenges for research on the transmission of income across generations. We want to highlight three aspects in which an accumulated measure of income improves on age-specific measures. First, accumulated income captures that different individuals have different income trajectories over their life courses. Second, accumulated income captures that individuals can have great variance in income over their life courses, for example, due to periods of unemployment or other reasons for being out of the labor market. Third, accumulated income is more robust to

error in the measurement of income as it is based on income measured over a large number of years and life course stages.

Stratification researchers and economists are aware of these problems (Jenkins 1987), and the two standard solutions have been, first, to focus on income measured in mid-adulthood when individuals are more established in the labor market and, second, to average income over several years. These solutions can, however, at best, give a partial correction to the problems associated with assessing life course patterns from a limited age range.

A small body of the literature has estimated whether current earnings could predict lifetime earnings (Björklund 1993; Böhlmark and Lindquist 2006; Haider and Solon 2006; Mazumder 2001). This literature found that the overall prediction is rather weak, and while it was best at ages 30 to 50, the correlation was typically around 0.6 to 0.7 (or about half of the variance explained). Before age 30, it was even weaker. Using five-year averages of income improved the prediction, but it remained far from perfect (Haider and Solon 2006; Mazumder 2001).

Such poor correspondence between mid-adulthood and life course earnings may arise because current income is a poor predictor of lifetime income due to measurement error and/or because income profiles are hard to measure as variability across years is high for some groups. It may also be that income trajectories between different groups are poorly captured by measures in mid-adulthood or that simply discarding information on income early (and late) in the life course has more important consequences than is often realized.

In addition, there may be differences within the population in how predictive mid-adulthood earnings are for lifetime earnings. In particular, different occupations have different life course income trajectories. Broadly, working class occupations will have flatter income trajectories, while professional jobs show much steeper income growth over the life course (Bhuller, Mogstad, and Salvanes 2011). Groups with high variability, due either to poverty and

hardship or occupation-specific characteristics, will also show low correspondence between mid-life and life course income; correspondingly, life course income measures will produce much less attenuation bias.

Early research on intergenerational mobility often used only income measured in a single year, though it was later realized that, due to the variability of income across years, this severely underestimated intergenerational persistence (Mazumder 2005). The standard practice in research in the last few decades has therefore been to use averages of income over several, for instance five, years to overcome these issues. This averaging of income measured in consecutive years overcomes the issue of variability at the age of measurement, but it does not capture that some individuals, especially those with low income, can have income trajectories over the entire life course that are characterized by high variability (Haider 2001). Despite this limitation of the standard practice, most research on intergenerational income mobility continues to focus on a brief age range to measure income.

As a result, sibling correlations will appear lower as the income of siblings may often be measured during a five-year period with unusually low or unusually high labor market attachment. Labor force responses to childbearing make such issues even more severe, in particular for women, as parenthood overlaps with the ages at which income is typically measured.

In Figure 1, we visualize several hypothetical cases to illustrate why it is misleading to use age-specific measures of income to estimate sibling similarity in income. We give four different examples, corresponding to the different problems discussed above. As can be seen, not using life course accumulated measures will often, but not always, result in an underestimation of sibling similarity, namely, an overestimation of intergenerational mobility. Standard research practices of examining only income in mid-adulthood or using averages of five years do not avoid these issues. For very long observation windows, for income of ten or

even better, twenty years, some issues are alleviated (see further discussion in our Results section).

[FIGURE 1 ABOUT HERE]

The issues of attenuation and life cycle bias have led to previous research often overestimating intergenerational mobility (Grawe 2006; Haider and Solon 2006; Jenkins 1987; Nybom and Stuhler 2016). Nybom and Stuhler (2017) studied income mobility for sons born in 1952 through 1957 (very similar to our study) and fathers born in 1927 through 1941 in Sweden. They observed sons' incomes from the ages of 22 to 50 and fathers' incomes from the ages of 33 to 60. Therefore, they had data on nearly the whole life courses of fathers and sons, but they missed the crucial start of the career in the father's generation. In addition, a potential problem may be that they had to limit their sample to sons and fathers born within the rather narrow time span for which they had information available. As we do not measure parental characteristics, we do not have to limit our sample to children with fathers born in a specific period.[3]

Previous research did not analyze sibling similarity in accumulated income with one exception. Bingley and Cappellari (2018) employed Danish data to estimate both sibling and parent-child correlations in earnings over the life course. They found a U-shape in the variation of sibling similarity in earnings over the life course. However, their empirical approach was very different from that of our study, as they did not accumulate income, as we do, but modelled life cycle bias and measurement error. For that reason, their measure of life cycle earnings is very different from our measures of accumulated earnings and disposable income.

Variation of Sibling Similarity in Income over the Life Course

These methodological reasons to take a life course perspective to the study of income mobility are important. In addition, there are also substantive reasons why it important to study changes in income mobility over the life course. The cumulative advantage model (DiPrete and Eirich 2006) expects sibling resemblance in income to increase over the life course. This model predicts that family background not only exerts an influence on men and women at the start of their labor market careers but also has a long-term impact allowing for a steeper career path for men and women from socioeconomically advantaged backgrounds. Therefore, this theoretical perspective leads us to expect an increase in sibling similarity, for example, the impact of family background over the life course.

Contrary to this, there are also reasons to expect sibling similarity in income to decrease over the life course. In the early 20s of their lives, siblings often share geographical locations (Kolk 2017), and shared experiences in childhood are very proximate. If individual characteristics, which are unrelated to family background, become more important over the life course, sibling similarity will decrease. This includes random events that positively or negatively affect earnings and disposable income, which Jencks et al. (1972) referred to as "luck." Genetic differences between siblings may also become more influential over the life course (Plomin 2018). It is intuitive to assume that shared background factors account for more in childhood, less in early adulthood, and even less at the end of the working life. In particular, for measures of current income, we expect sibling correlations to be substantially lower at higher ages, as shared childhood factors lessen in importance. However, this is not necessarily true for accumulated income, which considers how the influence of family background accumulates over the full life span.

Results from previous research that estimated changes in sibling similarity in occupation or income over the life course are mixed. On the one hand, research found sibling similarity in

occupational status to decrease over the life courses of men and women in Wisconsin (Hauser and Wong 1999; Warren, Hauser, and Sheridan 2002). Contrary to that, Conley (2008), using nationally representative data for the United States, found sibling similarity in income to increase over the life course. The study most similar to ours, that of Bingley and Cappellari (2018), found a weak U-shaped variation of brother similarity in (age-specific, not accumulated) earnings over the life course. They found brother similarity in earnings to be highest at age 25 (their starting point) and then decreased up to age 40 and increased again up to age 55 (their ending point).

This literature compared sibling similarity in income at different stages of the life course. Our data allow us to go one step further and to look at changes in sibling similarity in accumulated income over the life course. This allows us to comprehensively consider the complete life course trajectory.

Gender Differences in Sibling Similarity in Income

There are good reasons to expect intergenerational mobility to vary between men and women. We study differences between men and women in intergenerational income mobility by comparing brother and sister correlations in income. This has rarely been done in previous research.

Generally, we expect sister correlations in income to be lower than brother correlations in income. This can be the case because women are often less attached to the labor market than men. This lower labor market attachment of women can lead to more periods of no income but also to periods of reduced working hours and, therefore, lower earnings. In addition, female-dominated occupations often have less earnings inequality than male-dominated occupations. That is especially true in Sweden, a country in which many women work in the public sector.

Contrary to this expectation, Torche (2015b) argued that intergenerational mobility could be lower for women than for men for two reasons. First, parental investments in children may vary by gender and socioeconomic status (Freese and Powell 1999; Trivers and Willard 1973) which could lead to gender differences in intergenerational mobility. In Sweden, a society with widely shared norms of gender equality, this seems unlikely to be the case. Second, previous research found returns to education to be higher for women than for men (DiPrete and Buchmann 2006; Dougherty 2005).[4] These higher returns to education may result in lower income mobility for women (Torche 215b).

Many previous studies compared intergenerational mobility for men and women using measures of income or economic well-being at the family level (Chadwick and Solon 2002; Hirvonen 2008; Torche 2015b). Contrary to that, we follow a tradition that understands the individual and not the family to be the appropriate unit of analysis of stratification research (Acker 1973; Stanworth 1984). Such a point of view is theoretically appealing because the earnings or income of women may influence the power of women in a relationship. In addition, the society that we analyze is very much focused on the individual. Generally, women are integrated into the labor market in Sweden. In addition, the Swedish tax system is organized at the individual and not, as in some other countries, at the family level. These factors make our case different from a society such as Mexico, which Torche (2015b) analyzed. In addition, the concept of accumulated income is an inherently individual property and is hard to conceptualize at the couple level, in particular with increasing ages at partnership formation and increasing union instability over time.

Only a few studies compared mobility in individual income between men and women. Fertig (2003) found income mobility to be higher for women than for men using survey data from the Panel Study of Income Dynamics (PSID) in the United States. Using a 1% sample of tax data from Sweden, Österberg (2000) found stronger correlations between fathers and sons'

incomes than between fathers and daughters' incomes but higher intergenerational income correlations between mothers and daughters than between mothers and sons. Overall, the correlations between fathers and both daughters and sons' incomes were higher than those between mothers and their children. In addition, studies on intergenerational occupational mobility found few gender differences (e.g., Beller 2009; Erikson and Goldthorpe 1992; Hout 1988).

Differences in Sibling Similarity in Income by Family Socioeconomic Background

The traditional approach to study sibling similarity assumes that the similarity between siblings does not vary among different social groups within society. There are, however, theoretical reasons to question this assumption.

According to Becker and Tomes (1976), parents reinforce ability differences between siblings. This behavior reduces the similarity between siblings. As socioeconomically advantaged families have more resources to implement such a reinforcing investment strategy, we expect, from this perspective, to see a stronger similarity between siblings in socioeconomically disadvantaged than in socioeconomically advantaged families (Conley 2008).

The model presented in Becker and Tomes (1976) has been very influential in economics, but it has also been criticized. Behrman et al. (1982) introduced a new model of parental responses to ability differences between siblings. According to their separable earnings-transfer model, parents with a high level of inequality aversion compensate for rather than reinforce ability differences between siblings. Socioeconomically advantaged families have more resources to implement such a compensating strategy (Griliches 1979). Conley (2004, 2008) therefore predicted that parents with many resources compensated for ability differences

between siblings, but that socioeconomically disadvantaged families, in line with Becker and Tomes (1976), reinforced ability differences.

There is some evidence for this dynamic with respect to labor market outcomes (Conley 2008; Conley and Glauber 2008). However, this prediction has never been tested outside of the United States. In addition, as argued above, we take a different approach than previous research by looking at measures of accumulated earnings and disposable income. Finally, we also have much more extensive and reliable data than Conley (2008) and Conley and Glauber (2008), who employed survey data from the PSID.

Three studies tested for socioeconomic differences in sibling similarity in education. These studies looked at the United States (Conley and Glauber 2008; Conley, Pfeiffer, and Velez 2007) and Germany (Grätz 2018) and, for the most part, found no evidence for such differences. Income mobility is, however, different from educational mobility, as parents can affect their children's income without affecting their education. Therefore, it is a different question whether sibling resemblance in income varies by family socioeconomic background. Both Conley (2008) and Conley and Glauber (2008) found lower sibling similarity in income in socioeconomically disadvantaged families in the United States. Conley (2008) found this to be due to increasing sibling similarity in income over the life course for the offspring of socioeconomically advantaged families. We test whether we can obtain similar results using our high-quality measures of accumulated income and earnings from Sweden.

Our use of measures of accumulated earnings and income adds depth to the analysis of socioeconomic differences in sibling similarity in income. Income trajectories can differ by family socioeconomic background. Socioeconomic differences in income trajectories are better captured by our accumulated measures of earnings and disposable income. Focusing on socioeconomic differences in accumulated income further highlights why it is important to take a life course perspective when studying income mobility.

DATA AND METHODS

Data

Our data come from Swedish administrative registers. The registers contain detailed sociodemographic information on the entire population of Sweden. For our study, we include cohorts born from 1950 to 1980. Our study population is all Swedish-born men and women of those cohorts who did not out-migrate or die before age 60. In order to conduct sibling analyses, we choose three focal cohorts of men and women (1955, 1965, and 1975) and examine all siblings born five years before and after these three cohorts; for example, our sibling groups include all siblings born to focal persons from 1950 to 1960, 1960 to 1970, and 1970 to 1980.[5] Siblings are connected through their parents by the Swedish multigenerational register (Statistics Sweden 2010). For the Swedish-born population, parent-child linkages are known in over 99% of the cases for both men and women. We define sibling groups as full siblings (i.e., siblings who share the same mother and father).

Individuals are also linked to yearly information from the Swedish tax authorities, starting from 1968. The registers contain all income known by the authorities, as well as other payments made by the Swedish state or municipal governments. Sweden had individual taxation throughout the period we study (though joint taxation for spouses was optional from 1968 to 1971), and all income refers to individual (not couple) income (and benefits). Income measurements refer to the total income reported to the tax office that year. In addition, capital gains and all social transfers are reported to the tax authorities. Measures of hours worked and wages are not available in Swedish registers, as they are derived from tax declarations of yearly income.

Our sample sizes are large. They are lowest for the oldest cohort (1950–1960) with 566,042 men and 563,727 women. The second cohort (1960–1970) includes 647,586 men and 630,193 women. Finally, 627,052 men and 603,963 women make up the 1970–1980 cohort.

Variables

We focus on two income variables. Our first is *earnings*, which is a measure of all wage income before taxes. The second is *disposable income*, which is the net of taxes and includes all social benefits and transfers paid by the government (e.g., pensions, child allowances, unemployment benefits, student financial aid, and social welfare), as well as all sources of income, such as capital gains and profit from companies.

We focus on these measures, as they have been the two reliable income variables available in Swedish registers since 1968. Disposable income is an accurate measure of the actual resources available to men and women, while earnings represents the labor market engagement and success of our index population. The earnings measure is representative of the employer's perspective on an individual's labor supply. As earnings is based on pre-tax income (which is progressive), it is less concentrated than disposable income, which is after taxation and includes various income protection and social welfare payments. All of our income variables are inflation—but not wage growth—adjusted (using year 2000 as a reference). For this reason, we observe substantial growth in real income across cohorts.

As we uniquely have income time series over the entire life course, we present how sibling correlations are related to measurement at different ages, but we also accumulate income and earnings over the life cycle. We therefore present two different kinds of measures, measured at five-year age intervals from ages 20 to 60. We examine sibling correlations using *income measured at the same age*, averaged over the two previous and the two subsequent years, and—most novel—*accumulated income*. Accumulated income is the sum of all income

(earnings or disposable income) measured up to that age, starting from age 18. Accumulated income at age 30 is therefore the accumulated income from ages 18 to 30, and accumulated income at age 60 is an accurate representation of all income earned up to that age, or, put differently, life course income.[6]

As our sibling comparison models are based on siblings born within eleven years of each other, we want to note that our models always compare men and women at exactly the same age in the life course; that is, we observe earnings and disposable income of siblings in different years. We do this to get as accurate a representation as possible of life course patterns in sibling resemblance in income, which is our research topic.

Both variables of income occasionally include individuals with very high earnings and disposable income (in particular the latter as it includes capital gains, which can be very large in some years). For this reason, we log both our yearly measures and accumulated measures (the latter after we accumulated it).

Descriptive statistics on earnings and disposable income at different ages are reported in Table S1 in the *Online Supplement*. As described above, all measures of earnings and disposable income are logged. Because of this, respondents with zero values do not contribute to the specific sibling correlations. This leads to a loss of observations in the earliest years, i.e., for someone who has no earnings at age 20 or 25. It should, however, be noted that the share with no accumulated earnings and disposable income is only around 10% at age 25 and around 1% (disposable income) to 2% (earnings) from mid-adulthood onwards, which is our main focus. Proportions are slightly higher for women. In other words, virtually the entire population has some income at some stage of the life course, and the group with zero accumulated earnings and disposable income at age 50 is likely highly unrepresentative and captured poorly by administrative data sources. We report the share of zeroes with respect to all our measures in Table S1 in the *Online Supplement*.

Analytical Strategy

We estimate sibling correlations with restricted maximum likelihood estimation (Mazumder 2008; Schnitzlein 2014). We measure the logarithm of earnings and disposable income in their accumulated and non-accumulated forms using the following equation:

$$y_{ij} = a\, X_{ij} + \varepsilon_{ij}, \quad (1)$$

with y being our dependent variable (earnings or disposable income), j the identifier of the sibling within family i, and X a vector of control variables (dummy variables for year of birth). Under the assumption that the family and the individual variance are independent (we relax this assumption when looking at socioeconomic differences in sibling similarity), we can decompose the overall variance σ_e according to the following formula:

$$\sigma_\varepsilon^2 = \sigma_a^2 + \sigma_b^2. \quad (2)$$

The sibling correlation is the ratio between the family-specific component of the variance and the total variance:

$$\rho = \sigma_a^2 / (\sigma_a^2 + \sigma_b^2). \quad (3)$$

All analyses are conducted using the mixed command in Stata 15.

RESULTS

We begin by presenting two figures with results on sibling similarity for men and women over the life course. Figure 2 reports brother correlations in earnings and disposable income. Figure 3 reports sister correlations in earnings and disposable income.

Men

Figure 2 shows the brother correlations in the five-year average of earnings (Panel A), the five-year average of disposable income (Panel B), accumulated earnings (Panel C), and accumulated disposable income (Panel D). It includes estimates for three cohorts with siblings born from 1950–1960, 1960–1970, and 1970–1980. The estimates used to generate this figure are all reported in Table S2 in the *Online Supplement*.

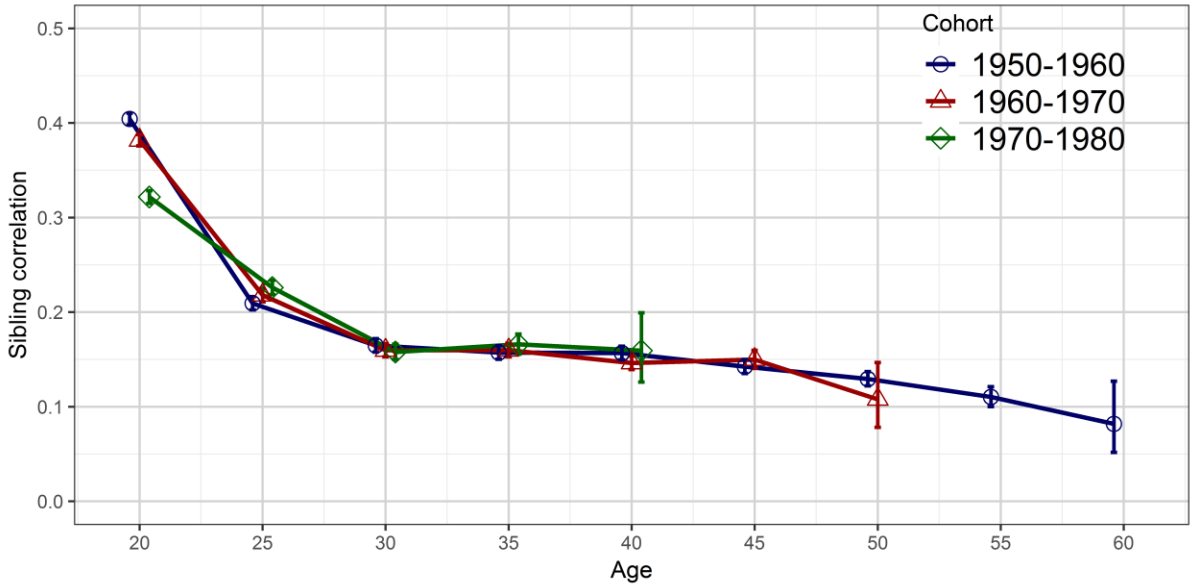
The results for earnings and disposable income are to a large degree similar. Brother similarity in age-specific earnings decreases over the life course (Panel A). This decrease is very strong, as the brother correlation in income decreases from 0.32 (cohort 1970–1980) and 0.40 (cohort 1950–1960) to 0.08 at age 60. We observe this decrease of brother similarity in earnings over the life course for all three cohorts included in our study.

The estimates for the five-year average of disposable income also show decreasing brother correlations over the life course (Panel B). At age 20, the resemblance of brothers in income is highest in all cohorts with correlation from 0.32 (cohort 1970–1980) to 0.41 (cohort 1950–1960). It drops below 0.25 at age 25 and then stays largely stable around 0.20 over the further life course.

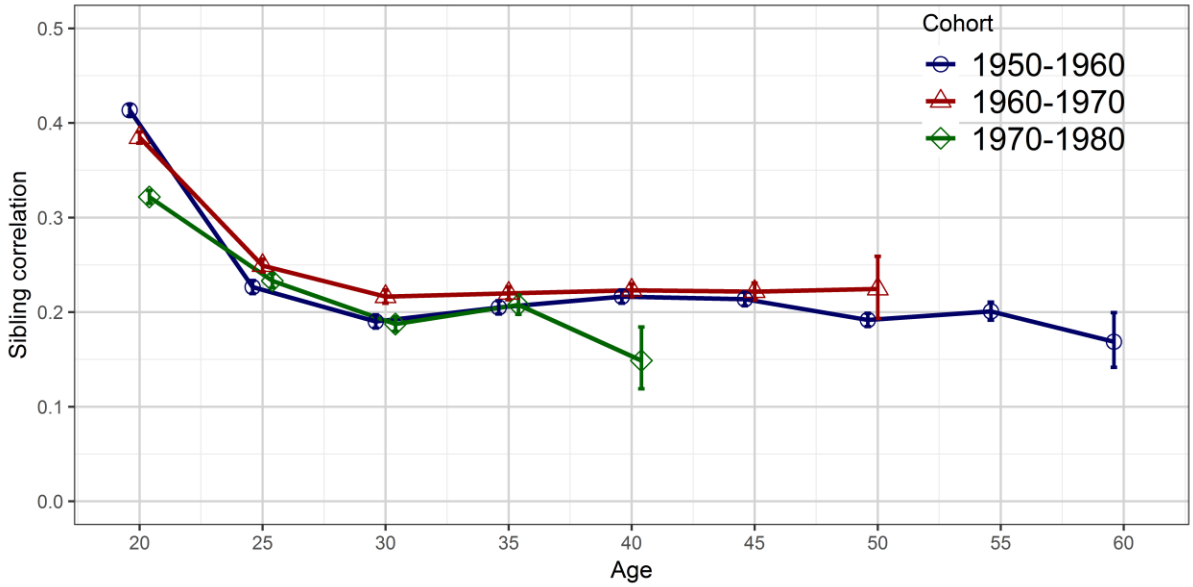
If we switch to using our measure of accumulated earnings (Panel C), we still observe a decrease in brother similarity from ages 25 to 30 (from around 0.35 to 0.25) but see stability over the life course from ages 30 to 60. Moreover, estimates of sibling similarity in accumulated earnings are considerably higher than estimates of sibling resemblance in age-

Figure 2. Sibling Correlations in Earnings and Disposable Income, Men

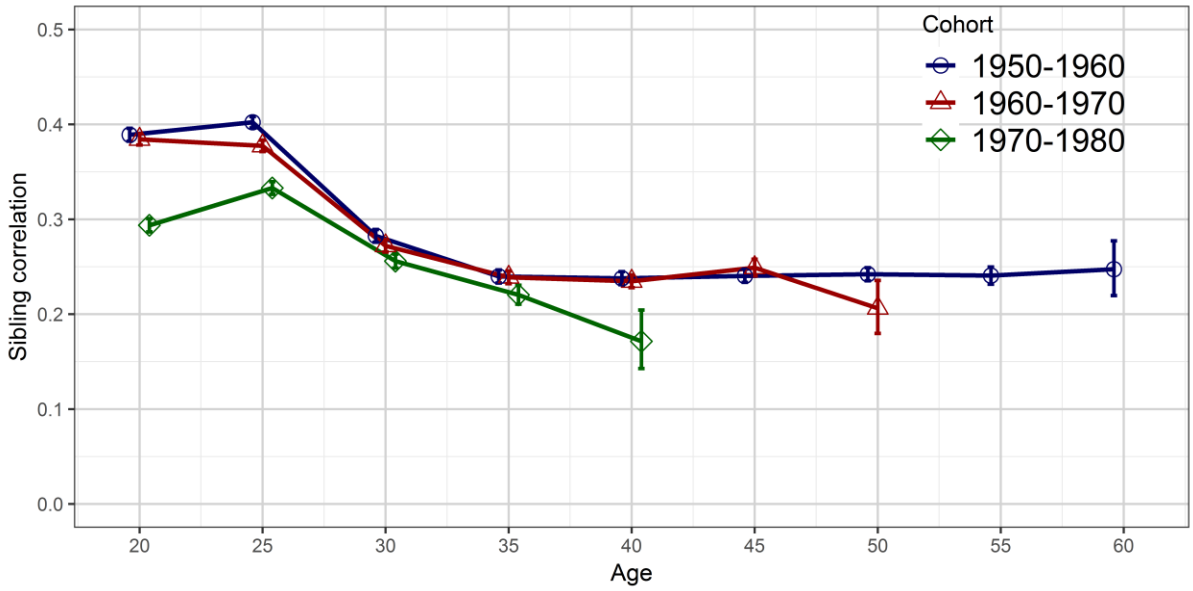
Panel A: 5-Year-Average, Earnings



Panel B: 5-Year-Average, Disposable Income



Panel C: Accumulated, Earnings



Panel D: Accumulated, Disposable Income

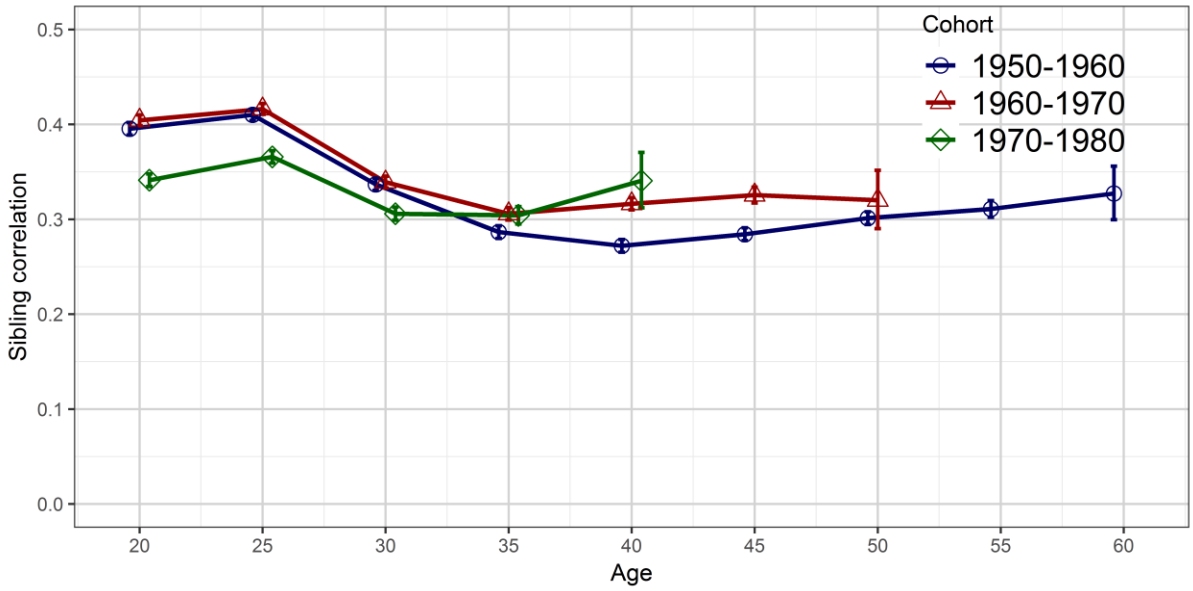
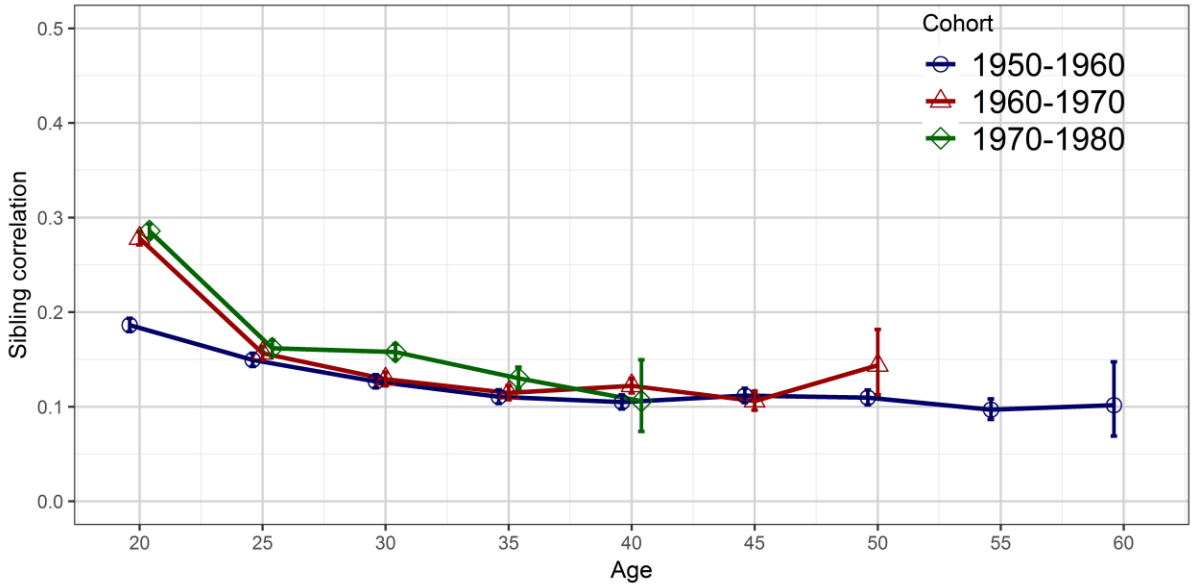
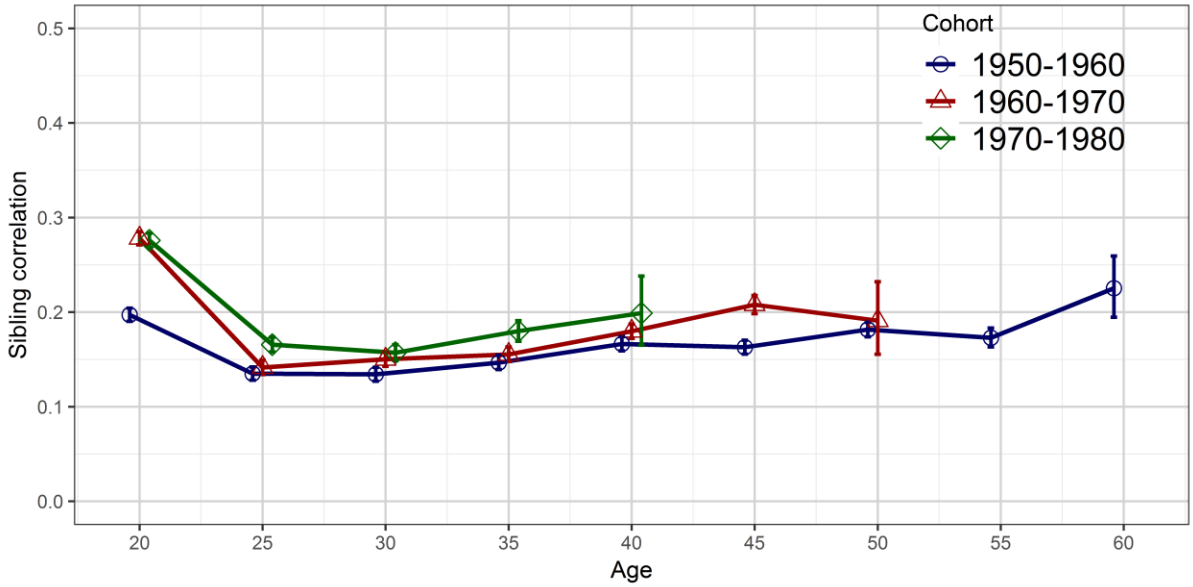


Figure 3. Sibling Correlations in Earnings and Disposable Income, Women

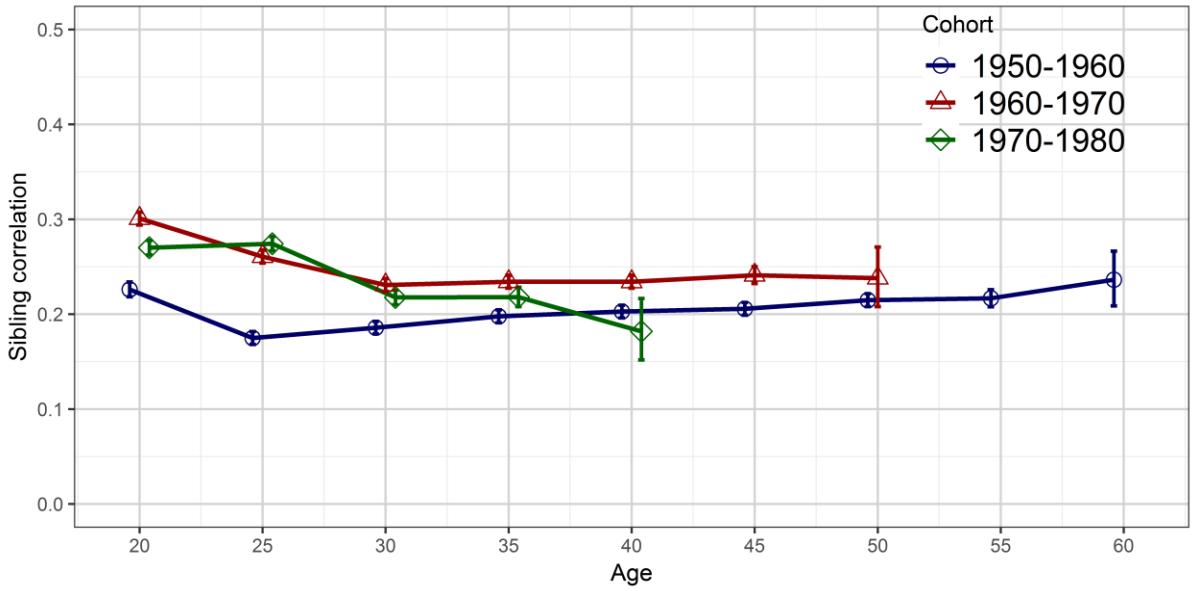
Panel A: 5-Year-Average, Earnings



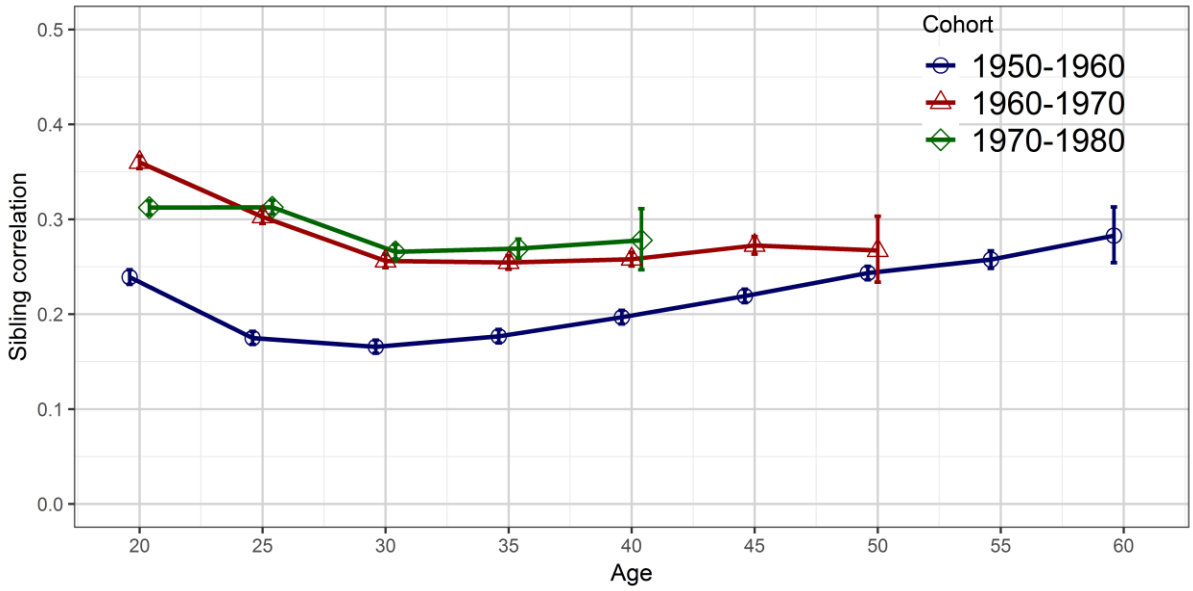
Panel B: 5-Year-Average, Disposable Income



Panel C: Accumulated, Earnings



Panel D: Accumulated, Disposable Income



specific measures of earnings. The similarity in accumulated earnings suggests that the life courses of brothers are quite similar. Early in the life course, we find generally high correlations (particularly for men), which are likely related because siblings share more common experiences at these ages. These differences may be due to sibling similarity in, for example, educational timing and trajectories, recent high school education, and geographic location that may perhaps be less reflective of eventual socioeconomic position than later measurement. Here, we find fewer differences between accumulated and current earnings, which is natural, as at this stage the measures very much resemble each other. In addition, many of the age patterns we find when comparing current income at different ages are not really reflected in our measure of accumulated income that is more stable over time. This suggests that accumulated income captures a more stable aspect of socioeconomic status than age-specific income.

In addition, brother similarity in accumulated disposable income (Panel D) varies little over the life course. If at all, we observe a slightly U-shaped pattern with a peak at age 25 at a level from 0.37 (cohort 1970–1980) to 0.41 (cohort 1950–1960), a decrease to around 0.30 up to age 35, and a further increase of brother similarity up to age 60 when the correlation is 0.33. However, the substantive size of the variation in brother similarity over the life course is small.

Brother correlations in accumulated income are constantly higher than those in income at a specific stage in the life course. We can therefore conclude that the standard practice to use non-accumulated measures of income (e.g., by averaging over 5 years) leads us to overestimate mobility and to observe an incorrect pattern of a decrease in the similarity between brothers over the life course. Therefore, our conclusions are affected by shifting to a measure of accumulated earnings and disposable income.

For men, we observe no variation across cohorts. This result shows that the intergenerational mobility of men has not changed across the cohorts included in our study for men in Sweden.

Women

We report the results for women in Figure 3 using the same structure as with Figure 4, which reported our findings for men. We look at sister similarity over the life course using a five-year average of earnings at each age (Panel A), a five-year average of disposable income (Panel B), accumulated earnings (Panel C), and accumulated disposable income (Panel D). The precise estimates used to construct this figure are reported in Table S3 in the *Online Supplement*.

For women, we observe a decrease in the sister resemblance in age-specific earnings from ages 20 to 50 (Panel A). For the two most recent cohorts, sister similarity in earnings decreases from above 0.25 to below 0.15. A decrease is also observed for the oldest cohort in our data, although the sister correlation at age 20 (0.19) is also rather low for this cohort.

Sister correlations in five-year averaged disposable income (Panel B) decrease from 0.25 to 0.15 from ages 20 to 25 (apart from the 1950–1960 cohort). After that age, sisters become more similar in their current disposable income, reaching the peak in similarity at age 60 with a sister correlation close to 0.25.

If we focus on our accumulated earnings measure (Panel C), we observe a largely stable sister correlation around 0.25 over the whole life course, in particular from ages 30 to 50. For the oldest cohort, we even observe a slight increase in sister similarity from ages 25 to 60 (from 0.17 to 0.24).

Comparing our accumulated and non-accumulated measures of earnings, we make the following conclusions. First, we underestimate the amount of similarity between sisters using age-specific instead of accumulated measures, in other words we overestimate

intergenerational mobility. Second, we observe a decrease in sister resemblance in age-specific earnings over the life course that does not hold up if we look at accumulated earnings. Third, comparing the three cohorts, we also observe a stronger impact of family background on income for the more recent cohorts of women, but differences are less pronounced for earnings than for disposable income.

Sister correlations in accumulated disposable income (Panel D) show a large difference between the 1950–1960 and each of the two more recent cohorts. We observe a strong increase in the resemblance of sisters in accumulated disposable income from ages 30 to 60 (from 0.17 to 0.28) for the 1950–1960 cohort. However, for more recent cohorts, sister similarity in income is stable over the life course, varying only from 0.25 to 0.30 from ages 30 to 60. The lower sibling correlations of our earliest cohort are likely a reflection that female labor force participation is much lower for this cohort, and that individual income is less reflective of the socioeconomic status of these women, as compared to later cohorts when Sweden can more accurately be described as a true dual-earner society.

As it was the case for the estimates for men, sibling similarity in accumulated income for women is much higher than sibling similarity in age-specific income. Therefore, the results for women support the main conclusion of our analysis: previous research overestimated mobility by underestimating sibling similarity by using non-accumulated measures of income.

Contrary to brother correlations, sister correlations increase across the three cohorts included in our study. This result implies that increasing gender equality and female labor force participation coincides with an increasing impact of family background. For our latest cohorts, we find that sister similarity in accumulated disposable income and earnings is quite similar to that of men, but that it is consistently slightly lower across age measurements. This is likely a reflection that Sweden, unlike some other high-income countries, has very high female labor force participation.

For ease of reference, Table 1 provides an overview of our preferred measures of sibling similarity in accumulated earnings and disposable income at ages 50, 55, and 60.

Table 1. Summary of Sibling Correlations in Accumulated Earnings and Disposable Income for Men and Women born 1950-1960

	Men		Women	
Age	Earnings	Disposable Income	Earnings	Disposable Income
50	0.24	0.30	0.21	0.24
	[0.24, 0.25]	[0.29, 0.31]	[0.21, 0.22]	[0.24, 0.25]
55	0.24	0.31	0.22	0.26
	[0.23, 0.25]	[0.30, 0.32]	[0.21, 0.23]	[0.25, 0.27]
60	0.25	0.33	0.24	0.28
	[0.22, 0.28	[0.30, 0.36]	[0.21, 0.27]	[0.25, 0.31]

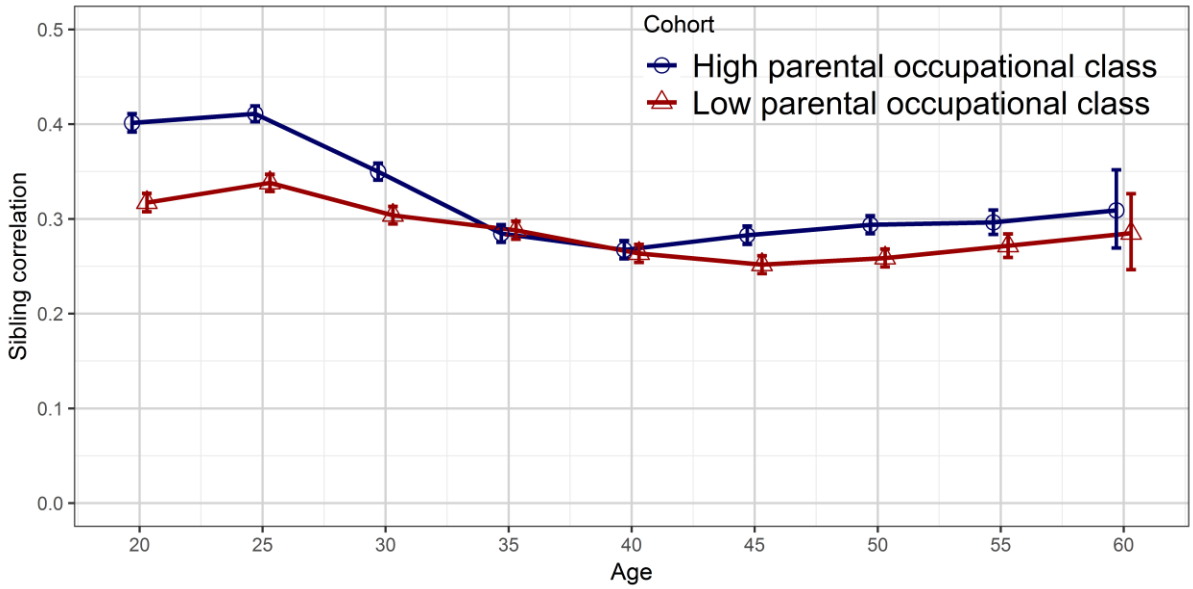
Note: 95% confidence intervals in brackets.

Socioeconomic Differences in Sibling Similarity in Income

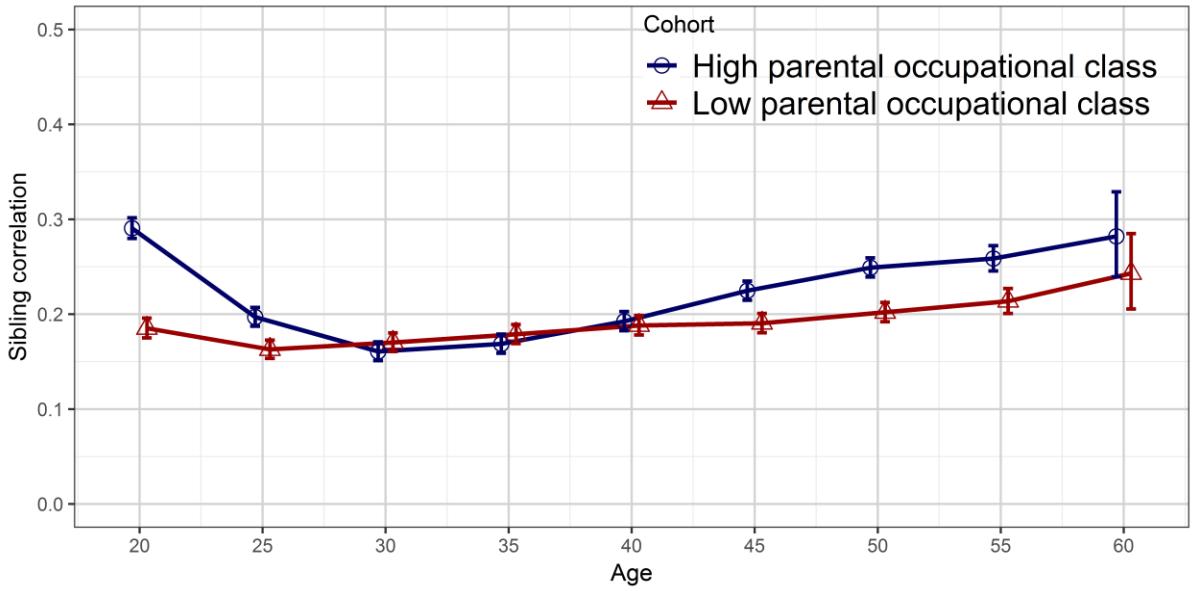
The estimates we presented in the previous section assumed that sibling similarity in income did not vary across social groups. We test this assumption and the theories that predict variation of sibling similarity by family socioeconomic background in this section. We report separate estimates of sibling similarity by parental occupational status (Panels A and B) and by parental education (Panels C and D) in Figure 4. To obtain two sub-groups for parental occupation, we split our observations into two samples based on the highest level of parental occupational status. The high parental occupation group is the group of men and women with a parent with an occupation in classes I and II of the Erikson–Goldthorpe–Portocarero (EGP) class schema (Breen 2004), and the low parental occupation group is the group with parents in all other social classes in the EGP class schema. With respect to parental education, we distinguish between those with a parent with tertiary education and those without any parent with tertiary education. All estimates underlying Figure 4 are reported in Table S4 in the *Online Supplement*.

Figure 4. Differences in Sibling Similarity in Accumulated Disposable Income by Family Socioeconomic Status, Cohort 1950–1960

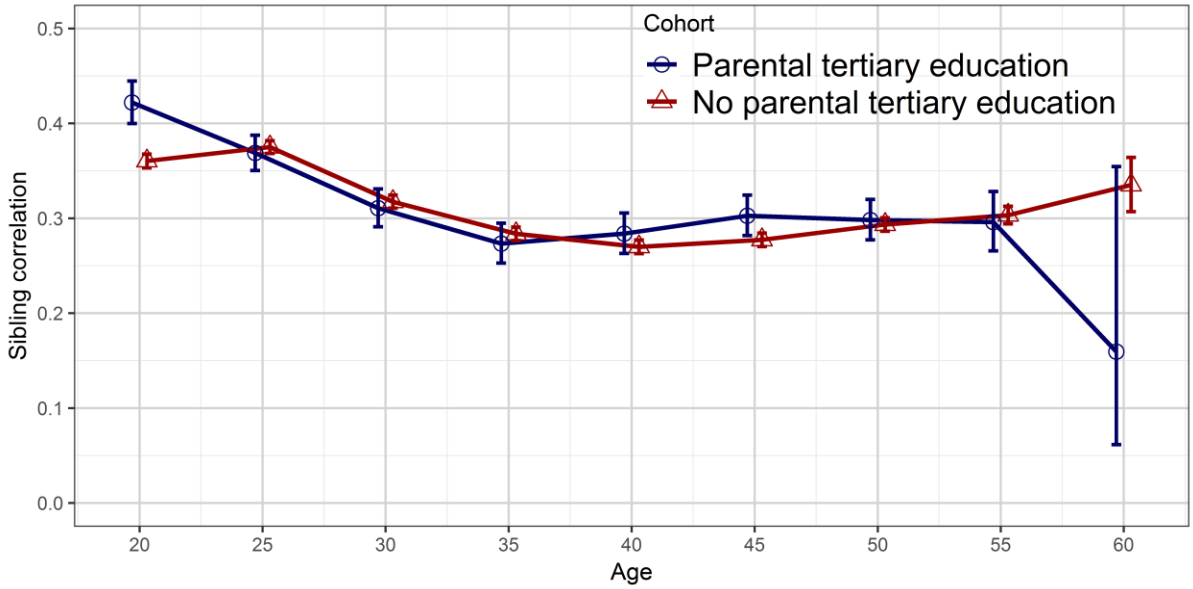
Panel A: Men



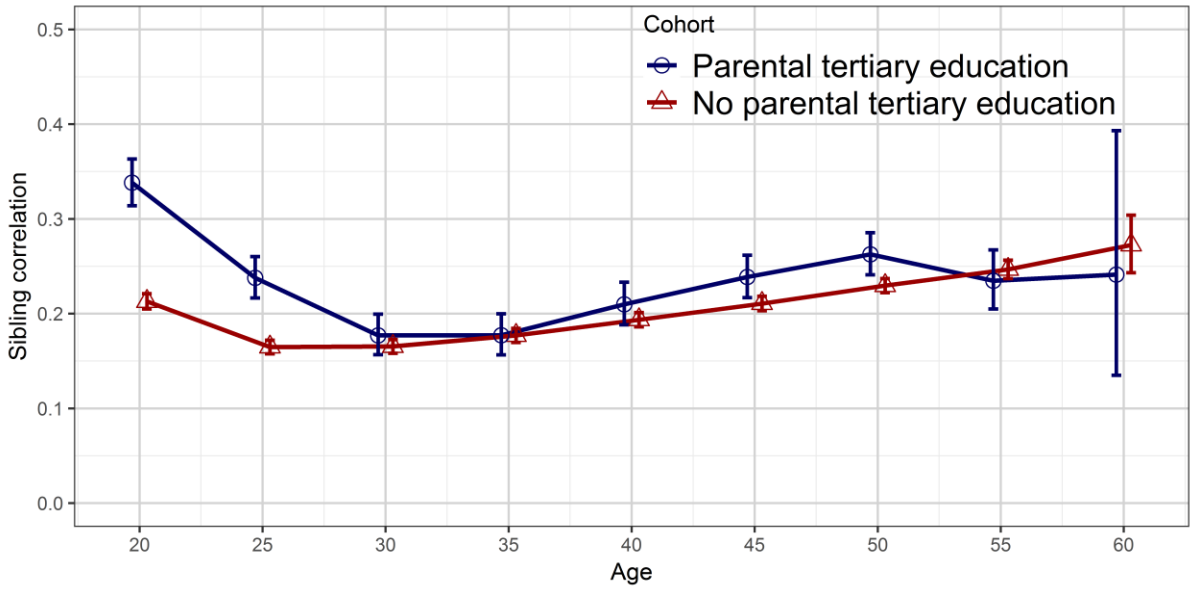
Panel B: Women



Panel C: Men



Panel D: Women



With respect to parental occupational status, we indeed observe that socioeconomic differences in sibling similarity in income do vary over the life course, but the variation we observe is much smaller in size than the one observed for the United States by Conley (2008). At young ages, for both men and women, sibling correlations are higher among siblings from families with a high parental occupational status than among siblings with a low parental occupational status. These socioeconomic differences disappear around the ages 30 and 40, but afterwards siblings in socioeconomically advantaged families again become more similar than siblings in socioeconomically disadvantaged families. The differences are largest at the end of the career, at age 60. They are moderate in size, around 0.03. The same pattern of socioeconomic differences is observed for both men and women.

With respect to tertiary education, there are hardly any differences between brother and sister similarity income by parental education. There are a few more differences for sisters than for brothers, but all differences are substantively small.

In summary, our findings provide only limited support to the claim that sibling resemblance in income is higher in socioeconomically advantaged than in socioeconomically disadvantaged families. Any socioeconomic differences that we find are substantively small suggesting that traditional sibling correlations, which are estimated at the population level, are not severely biased.

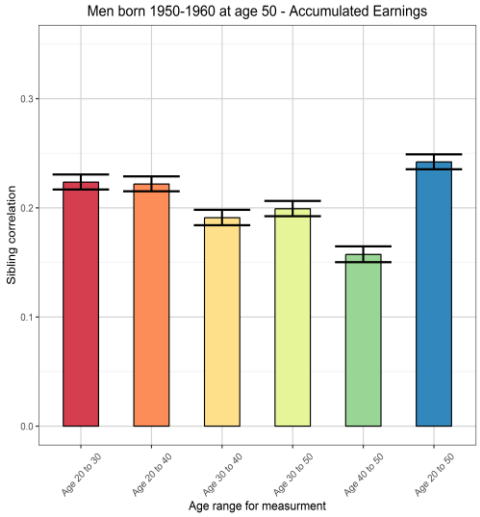
How Well Can Incomplete Data Approximate Sibling Similarity in Accumulated Earnings and Disposable Income over the Life Course?

We have an unusually extensive coverage of income over the life courses of men and women, which allows us to estimate accumulated earnings and disposable income from ages 18 and 60. Often, researchers have fewer data points available. To answer the question of how well incomplete data can approximate more complete life course, accumulated earnings and

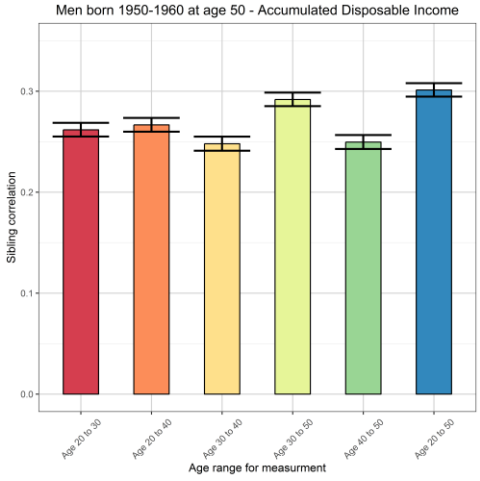
disposable income, we take the sibling similarity in earnings and disposable income accumulated from ages 20 to 50 (for which we have complete information available for all men and women included in the 1950–1960 cohort) as a benchmark. We compare how well we can approximate sibling similarity in earnings and disposable income with less information in Figure 5. The estimates underlying the figure are reported in Table S5 in the *Online Supplement*. We also produced estimates for ages 20 to 60, but then, as explained above, we had to rely on a less representative group of closely spaced siblings. These results confirm what we present below, and are available in Figure S2 in the *Online Supplement*.

Figure 5. Approximations of Sibling Correlations in Accumulated Income at Age 50 with Incomplete Information

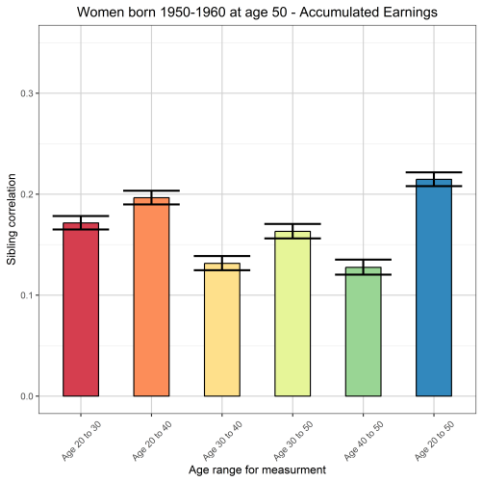
Panel A: Earnings, Men



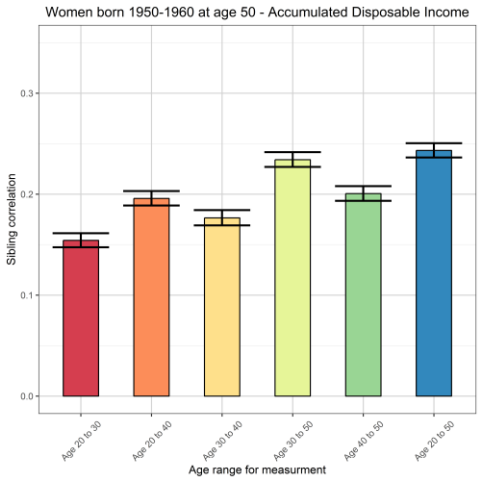
Panel B: Disposable Income, Men



Panel C: Earnings, Women



Panel D: Disposable Income, Women



The results show no uniform picture. Observing disposable income from ages 30 to 50 provides quite a good approximation of disposable income from ages 20 to 50, but this is not true for earnings, where such measurements underestimate sibling similarity. This main result of the comparison is true for both men and women. The sibling correlations in earnings from ages 20 to 30 and from ages 20 to 40 are nearly as high as the sibling correlations from ages 20 to 50. This result, which is again true for men and women, is probably due rather to the life course variation of sibling similarity than to accumulated earnings at younger ages, providing a good approximation of accumulated earnings over the whole life course.

For these reasons, the comparisons reported in Figure 5 support the main conclusion of our analysis: sibling similarity in life course income is higher than sibling similarity in income

measured at specific ages. Data which do not allow estimation of sibling similarity in accumulated earnings and disposable income are likely to underestimate the omnibus impact of family and community background on earnings and disposable income. For all our age range measurements, we find that using the complete life course gives the highest sibling correlation, while we find no other age range that consistently matches our life course estimates. In particular, for earnings, we find that even taking a 10- or 20-year average from ages 30 to 50 substantively underestimates sibling correlations, which is also reflected in our previous results using 5-year averages. The size of this bias is difficult to ascertain without having data covering the life course.

Therefore, a strong recommendation of our study is that mobility researchers should accumulate earnings and disposable income over the longest part of the life course possible to estimate intergenerational mobility. If only data for a limited age range are available, researchers may or may not be able to complement their measurement with expected income at different age ranges, but we caution against estimating intergenerational mobility based on data on only five to ten years of income from ages 30 to 40.

DISCUSSION AND CONCLUSION

Research on intergenerational mobility studies the transmission of inequality across generations. There is, however, a tension between the aim of mobility research and the standard analyses of income mobility that focus on income measured at specific periods in the parental and the children's life courses. In this manuscript, we have argued that a life course perspective to the intergenerational transmission of advantage is more appropriate to the actual aim of mobility analyses.

Our findings underline the relevance of a life course perspective. The first main implication of our results is that mobility analyses should focus on accumulated measures of

income and earnings. We found that intergenerational income mobility is overestimated by focusing on earnings or income measured at specific ages. Our estimates of sibling similarity in accumulated income are generally considerably higher than sibling similarity in earnings and income at specific points in a person's life course. We think that the higher estimates of intergenerational persistence are due to that the accumulated measures of income better account for life course income volatility, variation in steepness of income trajectories, and measurement error.

The second main result of our analysis is that intergenerational mobility, measured in terms of accumulated income and earnings, does not vary strongly over the life course, Increasing our accumulation period to closer reflect a life course of accumulated income, or permanent income, increases sibling correlations but only moderately. If we use sibling correlations in age-specific measures of income, we find a decrease in sibling similarity over the life course. This finding demonstrates that not only the level of sibling similarity but also substantive conclusions about the variation of sibling similarity in income over the life course are affected by using accumulated instead of non-accumulated measures of income.

Before the mid-20s we find high sibling correlations in accumulated income, which we think reflect that two distinct career pathways—being enrolled in tertiary education (with low income up to that age), and an early entry into the labor market in a blue-collar occupation—likely are highly correlated among siblings. Accumulated income histories at age 30–40 reflect a combination of low income due to tertiary enrollment but also some years of higher income due to the positive income returns of tertiary education, and we therefore find fewer differences in accumulated income across life course trajectories. When we account for the complete life course measuring accumulated income at age 60, we once again find higher sibling correlations, although the differences between ages 30–40 and 60 are not very large.

A third important finding of our analysis is that there are gender differences in income mobility, even in a gender-egalitarian society such as Sweden. However, gender differences diminish across cohorts, and in our latest cohort, the differences are not very large. Our findings suggest that increasing gender equality and female labor force participation across cohorts (Stanfors and Goldscheider 2017) is accompanied by an increasing impact of social origin on income and earnings. In our initial cohorts, women more often work part-time, while for our final cohorts, there are only minor differences between men and women. Even among our most recent cohort, however, the impact of family background is stronger among men than among women.

For men, we find that the importance of social background is largely stable over time for the cohorts we analyze. This is consistent with other research on income mobility in Sweden that has found only minor changes across cohorts (Björklund et al. 2009). However, the influence of family background increases for women across the three cohorts included in our study. These findings suggest, on the one hand, a persistence of the intergenerational transmission of income for men, notwithstanding the economic, political, and societal changes Sweden experienced across the cohorts we study. On the other hand, increasing gender equality and female labor force participation coincides with an increase of inequality in the transmission of income across generations for women. This likely partly reflects that individual income (as compared to household income) has become an increasingly important dimension of socioeconomic status for women in Sweden across cohorts.

Fourth, we test whether there are socioeconomic differences in the similarity between siblings. Previous research found a stronger similarity in income between siblings from socioeconomically advantaged families (Conley 2008; Conley and Glauber 2008). We find, however, such differences to be very small in Sweden. One possibility is that these differences are due to cross-country variation. Another possibility is that the high-quality Swedish register

data allow us to obtain more precise estimates than survey data for the United States. More cross-country comparative research is therefore needed to explore whether socioeconomic differences in the similarity in income vary across countries.

Our analysis reveals that employing a measure of accumulated income results in obtaining a stronger persistence in income across generations than estimates of previous research suggest. A central finding of previous research has also been that sibling similarity in income is considerably lower than sibling similarity in education or occupation (e.g., Schnitzlein 2014). Our results put this notion into doubt. We estimate sibling similarity in income to be around 0.33 for male siblings and therefore quite similar to estimates of sibling similarity of mixed sexed siblings in education of 0.39 in Sweden (Björklund and Jäntti 2012) and higher than the sibling correlation in occupational prestige of 0.29 in Sweden (Hällsten 2014). Thus, our study suggests that family background affects income to nearly the same degree as it affects education. The lower sibling correlations for income reported in the previous literature seem to be at least partly related to methodological challenges in measuring income accurately.

We believe that a contribution of our approach is that it allows us to consider income volatility and precariousness over the life course, an increasingly important dimension of social stratification in high-income societies (Kalleberg 2018; Stone and Arthurs 2013). By accounting for spells of low incomes over the life course, our methodology differs from previous approaches taken in the literature on intergenerational mobility.

Our analysis is limited to one country. We can only speculate what our estimates would look like in other societies, in particular in those with a lower level of income mobility, that is, higher sibling resemblance in income. We believe that there is no reason not to expect that similar differences between measures of accumulated and non-accumulated income can be found in those countries. If this prediction is true, income mobility in countries such as

Germany and the United States may be even lower than shown by previous research (Mazumder 2008, 2011; Schnitzlein 2014; Solon et al. 1991). More empirical research is needed to test this claim.

ENDNOTES

1. Some authors understand intergenerational income mobility only as the correlation between parental and offspring income. We use the term "intergenerational income mobility" in a broader sense, referring to the effect of family background on offspring's outcomes. For the mathematical relations between the sibling correlation in income and the intergenerational correlation in income, which is most often used in research on intergenerational income mobility, see Solon (1999).
2. We also assess sibling similarity across siblings of both genders. We think these results underestimate the effect of family background, as the heterogeneity in income trajectories across genders causes overall similarity to be much lower across siblings. Nevertheless, they are informative, and we present such results in Figure S1 in the *Online Supplement*. We do find much lower sibling similarity (e.g., a sibling correlation of slightly above 0.20 at age 50 in accumulated disposable income). We also find sibling similarity in income to increase across cohorts.
3. In other countries, in particular those without access to administrative data, the data situation is much worse than in Sweden. For instance, Gregg, Macmillan, and Vittori (2016) used probably the best data available for the United Kingdom but could observe parental income only at one point in the parental life courses and child income only at selected ages (ages 23, 33, 42, 46, and 50 for the National Child Development Study [NCDS] for a cohort born in 1958 and ages 26, 30, 34, 38, and 42 for the British Cohort Study [BCS] for a cohort born in 1970).
4. Contrary to that, Hubbard (2011) argued that there were no gender differences in the returns to education.
5. We asses sibling similarity at different exact ages. When we asses sibling similarity very close to the end of the observation in 2012, we do not base our results on a 10-year cohort

window of siblings, but, due to data limitations, on a shorter window. These analyses are both based on a different population and have a smaller analysis group, which is reflected in wider confidence intervals. Therefore, interpretations of the results for our highest ages should be done with some care (the rightmost data-point on each line in Figures 2-4).

6. We cannot analyze income beyond age 60 with the data we have. It is true that people may have income after age 60 and that this could contribute to their lifetime income. However, some people are also going to retire after this age and we think that pension income is different in a substantive way from income from labor. This would have implications for using income beyond age 60 even if we had the data available. Beyond age 60 we also need to increasingly account for mortality, and we note that it is problematic to decide which upper age as a limit for accumulating income if one is also interested in pension income. We think the term accumulated lifetime income for ages 18 to 60 is appropriate as it captures nearly a complete working life.

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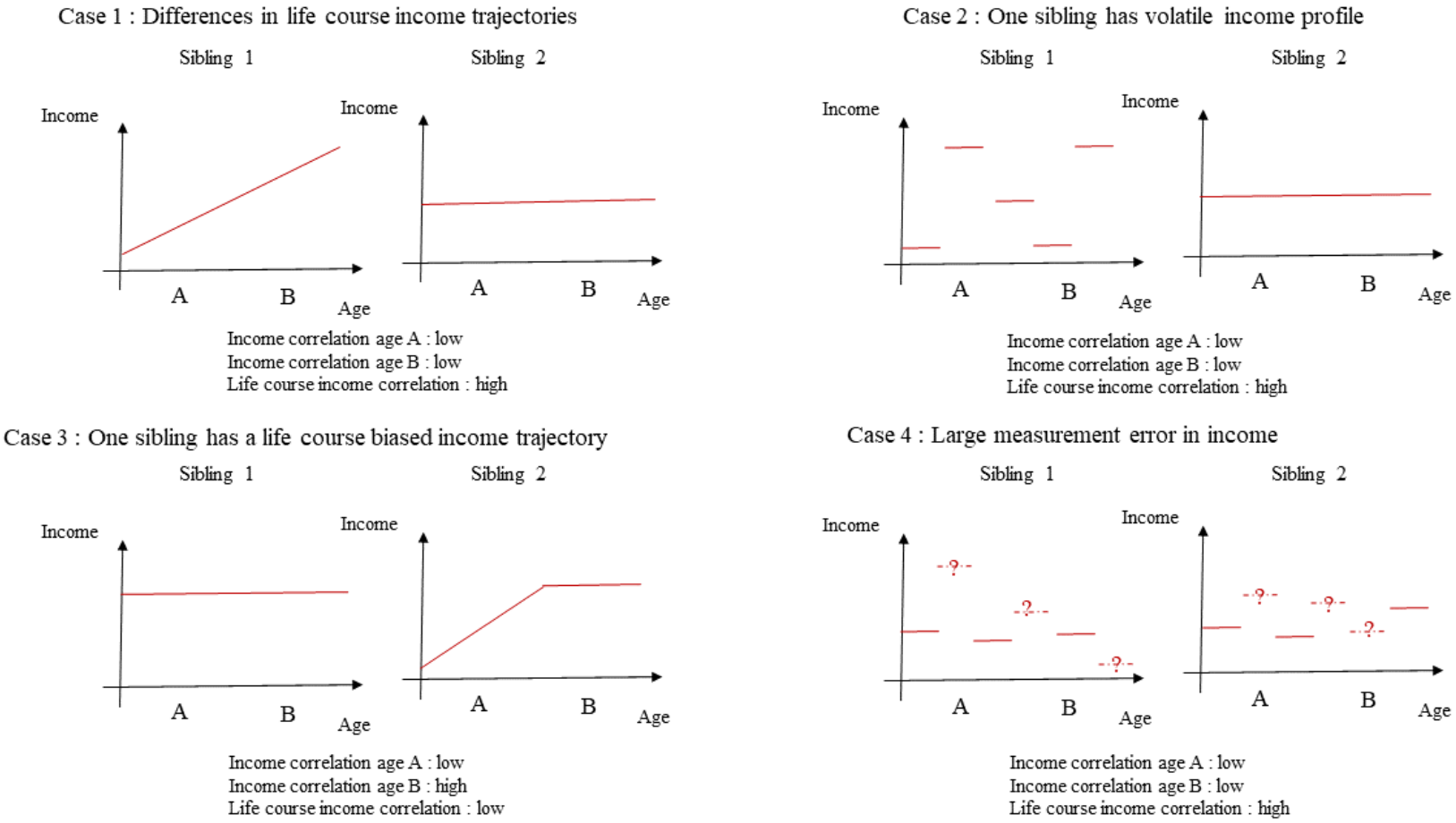
FIGURES

Figure 1. Differences between Life Course Stage-Based Estimates of Sibling Correlations Compared to Estimates of Life Course Accumulated Measures



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Sibling Similarity in Income: A Life Course Perspective

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Table S1. Descriptive Statistics

Panel A: 5-Year-Average, Earnings

		Men				Women			
Cohort	**Age**	**Mean**	**SD**	***N***	**0s in %†**	**Mean**	**SD**	***N***	**0s in %†**
1950–1960	20	70982.46	46839.84	566,042	0.13159	56747.19	41874.43	563,727	0.147312
	25	122738.2	65712.28	566,042	0.104072	80450.54	55220.17	563,727	0.116457
	30	149142.7	81766.45	566,042	0.089244	86124.54	60692.82	563,727	0.10134
	35	171315.4	126718.6	566,042	0.0762	101774.9	67753.99	563,727	0.085368
	40	196337.5	143895.6	566,042	0.080908	128681.3	85269.73	563,727	0.090815
	45	227139.7	179088.4	566,042	0.079574	159891.5	108583.8	563,727	0.086885
	50	254969.7	210332	566,042	0.088263	186365.3	130524.9	563,727	0.102021
	55	261691.5	218836.6	407,518	0.105151	194407.2	140565.6	407,421	0.124511
	60	244323.1	216688.4	150,948	-	184283.6	153051.1	151,211	-
1960–1970	20	68183.63	45855.09	647,586	0.146283	60161.75	40969.07	630,193	0.155622
	25	117105.5	75681.76	647,586	0.11763	79181.22	61336.39	630,193	0.135087
	30	154986.4	104172	647,586	0.108667	92765.64	72487.35	630,193	0.132639
	35	201334	148246.7	647,586	0.08805	122946.2	92933.36	630,193	0.103487
	40	247227.7	187285	647,586	0.076774	167115	120721.4	630,193	0.094411
	45	274153.6	218729	473,687	0.068723	200960.2	142601.7	460,390	0.083703
	50	279530.6	232879.1	162,408	-	212733.5	152242.1	159,592	-
1970–1980	20	48583.87	46531.18	627,052	0.200611	40930.38	38684.81	603,963	0.213732
	25	119200.6	91542.86	627,052	0.157506	83177.84	68284.33	603,963	0.1686
	30	190469.4	128319.3	627,052	0.114331	123675.7	94817.64	603,963	0.134343
	35	237793.9	159821.4	460,197	0.064139	153417.9	109551.4	445,247	0.090028
	40	273977.6	190483	175,779	-	192805	131232.7	171,471	-

† In focal cohort, i.e. 1955, 1965, and 1975.

Note: All measures of earnings and disposable income are logged.

Panel B: 5-Year-Average, Disposable Income

		Men				Women			
Cohort	**Age**	**Mean**	**SD**	***N***	**0s in %†**	**Mean**	**SD**	***N***	**0s in %†**
1950–1960	20	54392.04	32917.85	566,042	0.127138	46950.02	31202.91	563,727	0.134278
	25	91285.26	40508.03	566,042	0.100483	72862.89	38061.21	563,727	0.103656
	30	115438	71576.25	566,042	0.079927	91052.23	43929.9	563,727	0.083481
	35	140898.3	89730.7	566,042	0.056371	116361.8	51913.67	563,727	0.05852
	40	161479.8	246495	566,042	0.035384	133248.1	69347.79	563,727	0.037003
	45	184613.2	222150.5	566,042	0.027205	147489.5	87463.41	563,727	0.028657
	50	219374.3	278941.5	566,042	0.017692	169647.8	126100.2	563,727	0.018754
	55	240473.4	340206.3	407,518	0.009336	184537.3	136748.3	407,421	0.010545
	60	245168.8	331966.6	150,948	-	188817.3	197340.7	151,211	-
1960–1970	20	60608.74	33279.61	647,586	0.140087	58478.65	31238.94	630,193	0.148489
	25	104141.9	52933.28	647,586	0.10203	90248.36	46484.83	630,193	0.111909
	30	131264.7	84368.45	647,586	0.071899	112129.4	78146.73	630,193	0.076407
	35	163484.2	237251.8	647,586	0.053421	137614.4	92017.06	630,193	0.055628
	40	207926.4	271927.2	647,586	0.030807	168621.3	112600.8	630,193	0.031846
	45	240079.9	268639.3	473,687	0.009766	188993	129114.3	460,390	0.008994
	50	252999.3	341482.8	162,408	-	197721.3	147840.3	159,592	-
1970–1980	20	54107.07	39267.32	627,052	0.161418	51066.37	36341.12	603,963	0.16958
	25	107106.8	198657.4	627,052	0.132173	92746.38	56127.52	603,963	0.131256
	30	159026.6	186213.1	627,052	0.076771	131468.5	109387.1	603,963	0.074361
	35	206718.5	219096.8	460,197	0.015666	163747.7	179133.9	445,247	0.014088
	40	244894.6	477639.2	175,779	-	192525.5	131653.3	171,471	-

† In focal cohort, i.e. 1955, 1965, and 1975.

Note: All measures of earnings and disposable income are logged.

Panel C: Accumulated, Earnings

		Men				Women			
Cohort	**Age**	**Mean**	**SD**	***N***	**0s in %†**	**Mean**	**SD**	***N***	0s in %†
1950–1960	20	199036.4	192831.4	566,042	0.170995	153360.8	140396.7	563,727	0.186611
	25	728027.7	463354.4	566,042	0.107681	534022.5	407143.7	563,727	0.113013
	30	1423073	737702.4	566,042	0.090813	948589.6	752818.4	563,727	0.09422
	35	2235495	1095989	566,042	0.068159	1417834	941499.5	563,727	0.071438
	40	3164333	1615842	566,042	0.054076	2002576	1194281	563,727	0.059746
	45	4234659	2263341	566,042	0.038051	2739201	1548055	563,727	0.042937
	50	5463735	3066419	566,042	0.029088	3625088	2015907	563,727	0.033423
	55	6676047	3772206	407,518	0.020124	4486561	2481343	407,421	0.02568
	60	7737029	4406247	150,948	-	5184794	2971934	151,211	-
1960–1970	20	194961.3	280761.1	647,586	0.152243	175799.2	327102.9	630,193	0.159996
	25	702541.2	495032.1	647,586	0.119879	556226.3	465938.1	630,193	0.131121
	30	1396185	829085.5	647,586	0.095897	984702.4	683888.4	630,193	0.112758
	35	2306089	1321583	647,586	0.068471	1528629	972457.4	630,193	0.083344
	40	3456232	2002899	647,586	0.050465	2271110	1378879	630,193	0.060362
	45	4690968	2791575	473,687	0.02892	3145515	1865956	460,390	0.037232
	50	5800115	3573555	162,408	-	3982871	2330687	159,592	-
1970–1980	20	118778.4	161650.3	627,052	0.218242	109808.1	115438.4	603,963	0.224153
	25	570802.1	476033.3	627,052	0.161225	438086.8	357656.4	603,963	0.17381
	30	1394071	928728	627,052	0.122401	990437.8	681852.3	603,963	0.132346
	35	2475056	1492373	460,197	0.062736	1663460	1058308	445,247	0.08164
	40	3751458	2167769	175,779	-	2511021	1510818	171,471	-

† In focal cohort, i.e. 1955, 1965, and 1975.

Note: All measures of earnings and disposable income are logged.

Panel D: Accumulated, Disposable Income

		Men				Women			
Cohort	**Age**	**Mean**	**SD**	***N***	**0s in %†**	**Mean**	**SD**	***N***	**0s in %†**
1950–1960	20	155946.6	132842.8	566,042	0.173545	127244.3	110313.4	563,727	0.197856
	25	553473.5	288413.7	566,042	0.10772	457519	259616.6	563,727	0.112799
	30	1076018	529956.7	566,042	0.08944	868619.9	420191	563,727	0.092916
	35	1735661	749944.2	566,042	0.064687	1403485	608469.2	563,727	0.066925
	40	2502280	1517552	566,042	0.038051	2038290	816746.1	563,727	0.040953
	45	3371961	2044698	566,042	0.02897	2746172	1090129	563,727	0.031809
	50	4401322	2870974	566,042	0.021654	3546911	1465257	563,727	0.022315
	55	5414934	3484628	407,518	0.009885	4281227	1794135	407,421	0.010992
	60	6342963	4452899	150,948	-	4862162	2208525	151,211	-
1960–1970	20	179456.6	128937.5	647,586	0.149507	170712.4	120708	630,193	0.159017
	25	632977.6	320708.7	647,586	0.116592	579352.7	296586.2	630,193	0.126175
	30	1234679	596762.8	647,586	0.078473	1093881	574783.4	630,193	0.084356
	35	1979551	1038081	647,586	0.059806	1728780	869508.4	630,193	0.06392
	40	2929831	2157065	647,586	0.041768	2508319	1258881	630,193	0.042178
	45	3969375	2733543	473,687	0.016245	3348573	1516505	460,390	0.016976
	50	4936209	3793699	162,408	-	4111659	1900218	159,592	-
1970–1980	20	147486.9	155022.7	627,052	0.165962	143100.4	133912.4	603,963	0.180509
	25	592048.4	397020.1	627,052	0.146629	537968.1	330704.8	603,963	0.148576
	30	1280880	1384463	627,052	0.106735	1119224	694318.9	603,963	0.101302
	35	2196098	2304003	460,197	0.038789	1853648	1408517	445,247	0.035637
	40	3302496	4442956	175,779	-	2736222	1502355	171,471	-

† In focal cohort, i.e. 1955, 1965, and 1975.

Note: All measures of earnings and disposable income are logged.

Table S2. Sibling Correlations in Earnings and Disposable Income, Men

Panel A: 5-Year-Average, Earnings

Cohort	Age	Sibling Correlation	Lower Bound, 95% Confidence Interval	Upper Bound, 95% Confidence Interval
1950–1960	20	0.404174	0.39795	0.410428
	25	0.209307	0.202367	0.21642
	30	0.164763	0.157845	0.171922
	35	0.157231	0.15027	0.164453
	40	0.156688	0.149704	0.163934
	45	0.142424	0.135174	0.149995
	50	0.129342	0.122009	0.137047
	55	0.110243	0.100168	0.121194
	60	0.081772	0.051717	0.126955
1960–1970	20	0.381706	0.375694	0.387755
	25	0.217937	0.210964	0.225075
	30	0.159549	0.152687	0.166659
	35	0.159732	0.152755	0.166964
	40	0.146279	0.139263	0.153586
	45	0.149869	0.140627	0.159606
	50	0.107794	0.078228	0.146754
1970–1980	20	0.32171	0.314971	0.328525
	25	0.226011	0.218482	0.233722
	30	0.157859	0.149945	0.166108
	35	0.16599	0.155614	0.176913
	40	0.159327	0.12611	0.199298

Panel B: 5-Year-Average, Disposable Income

Cohort	Age	Sibling Correlation	Lower Bound, 95% Confidence Interval	Upper Bound, 95% Confidence Interval
1950–1960	20	0.413418	0.407263	0.4196
	25	0.226468	0.219589	0.233498
	30	0.190064	0.183135	0.197193
	35	0.204974	0.198032	0.212096
	40	0.21632	0.209416	0.223386
	45	0.213729	0.206746	0.220883
	50	0.19167	0.184824	0.198708
	55	0.200821	0.19146	0.21052
	60	0.168635	0.141709	0.199488
1960–1970	20	0.384619	0.378628	0.390646
	25	0.249214	0.24255	0.256
	30	0.216354	0.209507	0.223362
	35	0.219839	0.213123	0.226705
	40	0.223117	0.216389	0.229993
	45	0.221646	0.212844	0.230705
	50	0.224445	0.193376	0.258903
1970–1980	20	0.321772	0.315082	0.328536
	25	0.233113	0.225849	0.240538
	30	0.18731	0.179814	0.195044
	35	0.207699	0.197698	0.218067
	40	0.14869	0.119017	0.184213

Panel C: Accumulated, Earnings

Cohort	Age	Sibling Correlation	Lower Bound, 95% Confidence Interval	Upper Bound, 95% Confidence Interval
1950–1960	20	0.389067	0.382364	0.395813
	25	0.402226	0.396177	0.408306
	30	0.282521	0.275836	0.289304
	35	0.239715	0.232895	0.246669
	40	0.237841	0.231038	0.244781
	45	0.240384	0.233599	0.247303
	50	0.242074	0.235298	0.248982
	55	0.240587	0.231588	0.249823
	60	0.247365	0.219654	0.277329
1960–1970	20	0.384248	0.378325	0.390206
	25	0.377384	0.371337	0.383469
	30	0.272104	0.265562	0.278746
	35	0.238869	0.232228	0.24564
	40	0.234657	0.227996	0.241452
	45	0.248934	0.240256	0.257818
	50	0.206256	0.179704	0.235605
1970–1980	20	0.293685	0.286717	0.300752
	25	0.332955	0.32631	0.339667
	30	0.255896	0.248667	0.263262
	35	0.220343	0.210539	0.230471
	40	0.171416	0.142803	0.204394

Panel D: Accumulated, Disposable Income

Cohort	Age	Sibling Correlation	Lower Bound, 95% Confidence Interval	Upper Bound, 95% Confidence Interval
1950–1960	20	0.395417	0.388758	0.402116
	25	0.410026	0.404097	0.41598
	30	0.336805	0.330459	0.34321
	35	0.286467	0.279835	0.293193
	40	0.272027	0.265346	0.278813
	45	0.284258	0.277588	0.291023
	50	0.301202	0.294577	0.307912
	55	0.310867	0.302127	0.319745
	60	0.327168	0.299664	0.355914
1960–1970	20	0.404314	0.398553	0.410102
	25	0.416263	0.410493	0.422057
	30	0.339199	0.332924	0.34553
	35	0.305741	0.299308	0.31225
	40	0.31631	0.309918	0.322772
	45	0.325475	0.317248	0.333812
	50	0.320068	0.290127	0.35157
1970–1980	20	0.341206	0.334568	0.347908
	25	0.365708	0.359186	0.37228
	30	0.305859	0.298978	0.312827
	35	0.304118	0.295031	0.313361
	40	0.340659	0.312091	0.370433

Table S3. Sibling Correlations in Earnings and Disposable Income, Women

Panel A: 5-Year-Average, Earnings

Cohort	Age	Sibling Correlation	Lower Bound, 95% Confidence Interval	Upper Bound, 95% Confidence Interval
1950–1960	20	0.18634	0.179369	0.193517
	25	0.149375	0.14253	0.156488
	30	0.126675	0.119839	0.133841
	35	0.110422	0.103342	0.117923
	40	0.104887	0.097684	0.112554
	45	0.111668	0.104261	0.119532
	50	0.109553	0.101876	0.117733
	55	0.096873	0.086592	0.108231
	60	0.101638	0.068931	0.147406
1960–1970	20	0.277948	0.271161	0.284839
	25	0.156558	0.149543	0.163839
	30	0.129146	0.122029	0.136612
	35	0.114594	0.107395	0.122209
	40	0.12212	0.114709	0.12994
	45	0.105962	0.096292	0.116479
	50	0.143793	0.112705	0.1817
1970–1980	20	0.285746	0.278275	0.293336
	25	0.161821	0.153674	0.170314
	30	0.157774	0.149675	0.166226
	35	0.130089	0.11913	0.141894
	40	0.105916	0.073859	0.14964

Panel B: 5-Year-Average, Disposable Income

Cohort	Age	Sibling Correlation	Lower Bound, 95% Confidence Interval	Upper Bound, 95% Confidence Interval
1950–1960	20	0.197147	0.19021	0.204273
	25	0.134936	0.128131	0.142044
	30	0.134215	0.127027	0.141744
	35	0.146609	0.13922	0.15432
	40	0.16641	0.159002	0.174093
	45	0.162831	0.155673	0.170252
	50	0.181472	0.173951	0.189244
	55	0.172927	0.163203	0.183104
	60	0.225344	0.194554	0.259436
1960–1970	20	0.2781	0.271217	0.28509
	25	0.141482	0.134072	0.149231
	30	0.15018	0.142826	0.157843
	35	0.155265	0.147753	0.163086
	40	0.179765	0.172351	0.187425
	45	0.207886	0.19847	0.217627
	50	0.190942	0.15551	0.232228
1970–1980	20	0.275912	0.268478	0.283472
	25	0.165636	0.157961	0.173607
	30	0.157075	0.148976	0.165527
	35	0.179859	0.16919	0.191046
	40	0.199028	0.165001	0.238072

Panel C: Accumulated, Earnings

Cohort	Age	Sibling Correlation	Lower Bound, 95% Confidence Interval	Upper Bound, 95% Confidence Interval
1950–1960	20	0.226064	0.218398	0.233918
	25	0.174772	0.168097	0.181654
	30	0.185721	0.179134	0.192494
	35	0.197675	0.190955	0.204573
	40	0.202719	0.19605	0.209556
	45	0.205592	0.198885	0.212466
	50	0.214694	0.207944	0.221601
	55	0.216725	0.207912	0.225804
	60	0.236407	0.208781	0.266457
1960–1970	20	0.300796	0.29405	0.307629
	25	0.260702	0.253922	0.267597
	30	0.230761	0.224037	0.237625
	35	0.234211	0.227483	0.241076
	40	0.234151	0.22738	0.24106
	45	0.241058	0.232322	0.250015
	50	0.237965	0.208008	0.270761
1970–1980	20	0.27004	0.262511	0.277704
	25	0.27421	0.266792	0.281754
	30	0.217621	0.210051	0.225385
	35	0.217984	0.207976	0.228335
	40	0.181939	0.151741	0.216612

Panel D: Accumulated, Disposable Income

Cohort	Age	Sibling Correlation	Lower Bound, 95% Confidence Interval	Upper Bound, 95% Confidence Interval
1950–1960	20	0.239049	0.231509	0.246755
	25	0.174911	0.168186	0.181846
	30	0.16565	0.158866	0.172664
	35	0.17669	0.169729	0.183872
	40	0.196732	0.18967	0.20399
	45	0.219183	0.212135	0.226399
	50	0.243304	0.236309	0.250437
	55	0.257452	0.24834	0.266779
	60	0.282761	0.254353	0.313011
1960–1970	20	0.359952	0.353514	0.366441
	25	0.302563	0.295688	0.309528
	30	0.25609	0.249082	0.263225
	35	0.254425	0.247355	0.261628
	40	0.257916	0.250835	0.265126
	45	0.272463	0.263334	0.281787
	50	0.267111	0.233779	0.303313
1970–1980	20	0.312242	0.304951	0.319627
	25	0.312676	0.305418	0.320028
	30	0.265745	0.258189	0.27344
	35	0.269108	0.259247	0.279203
	40	0.277867	0.246754	0.311283

Table S4. Differences in Sibling Similarity in Accumulated Disposable Income by Family Socioeconomic Status, Cohort 1950–1960

Panel A: Men, Parental Occupational Status

Parental Occupational Status	Age	Sibling Correlation	Lower Bound, 95% Confidence Interval	Upper Bound, 95% Confidence Interval
High	20	0.401327	0.391671	0.411059
	25	0.41087	0.402523	0.419268
	30	0.349859	0.341001	0.358821
	35	0.284608	0.275329	0.294072
	40	0.267359	0.257853	0.277086
	45	0.28271	0.273159	0.292461
	50	0.293772	0.284312	0.303413
	55	0.296417	0.28371	0.309448
	60	0.309006	0.269271	0.351782
Low	20	0.317219	0.307595	0.327003
	25	0.337999	0.329023	0.347092
	30	0.303812	0.294646	0.313137
	35	0.28804	0.27866	0.297607
	40	0.263527	0.254173	0.273101
	45	0.251664	0.242379	0.261182
	50	0.258682	0.249311	0.268278
	55	0.271646	0.259426	0.284221
	60	0.284883	0.246456	0.326704

Panel B: Women, Parental Occupational Status

Parental Occupational Status	Age	Sibling Correlation	Lower Bound, 95% Confidence Interval	Upper Bound, 95% Confidence Interval
High	20	0.290598	0.27977	0.30167
	25	0.197045	0.187403	0.207057
	30	0.160758	0.151099	0.17091
	35	0.168699	0.158877	0.179
	40	0.192506	0.182564	0.202855
	45	0.22464	0.214675	0.234929
	50	0.249093	0.239173	0.259284
	55	0.258679	0.245649	0.272151
	60	0.281985	0.239347	0.328934
Low	20	0.185171	0.174958	0.195839
	25	0.162878	0.153498	0.172714
	30	0.170219	0.160619	0.18027
	35	0.178919	0.169047	0.189236
	40	0.188117	0.178085	0.198578
	45	0.190478	0.180537	0.200832
	50	0.202	0.192063	0.212315
	55	0.213676	0.200865	0.227072
	60	0.242991	0.205481	0.284894

Panel C: Men, Parental Education

Education	Age	Sibling Correlation	Lower Bound, 95% Confidence Interval	Upper Bound, 95% Confidence Interval
High	20	0.422076	0.399815	0.444658
	25	0.368853	0.350459	0.387637
	30	0.310615	0.291018	0.330916
	35	0.273301	0.252757	0.294856
	40	0.283766	0.262932	0.305566
	45	0.302723	0.281877	0.324414
	50	0.298126	0.277263	0.319865
	55	0.296028	0.265709	0.328259
	60	0.159495	0.061504	0.354618
Low	20	0.360369	0.353165	0.367637
	25	0.375022	0.368367	0.381725
	30	0.317458	0.310585	0.324412
	35	0.28365	0.276631	0.290777
	40	0.269877	0.262825	0.277048
	45	0.277255	0.270213	0.284409
	50	0.29336	0.286334	0.300487
	55	0.303297	0.294118	0.312635
	60	0.335065	0.307124	0.364212

Panel D: Women, Parental Education

Parental Education	Age	Sibling Correlation	Lower Bound, 95% Confidence Interval	Upper Bound, 95% Confidence Interval
High	20	0.338221	0.313994	0.363327
	25	0.237697	0.21656	0.260212
	30	0.177101	0.156656	0.199584
	35	0.177235	0.156593	0.199952
	40	0.209858	0.188273	0.233207
	45	0.238601	0.216992	0.261643
	50	0.262622	0.241062	0.285386
	55	0.234732	0.205004	0.267323
	60	0.241184	0.134923	0.393102
Low	20	0.2129	0.204982	0.221038
	25	0.164712	0.157659	0.172016
	30	0.165334	0.158185	0.172739
	35	0.176946	0.169598	0.184541
	40	0.193536	0.186092	0.201203
	45	0.210657	0.203211	0.218301
	50	0.229525	0.22209	0.237133
	55	0.246666	0.237052	0.256538
	60	0.272492	0.243214	0.303879

Table S5. Approximations of Sibling Correlations in Accumulated Income with Incomplete Information

Panel A: Earnings, Men

Age Range	Correlation	Lower Bound, 95% Confidence Interval	Upper Bound, 95% Confidence Interval
20–30	0.223588	0.216803	0.230522
20–40	0.221835	0.215079	0.22874
30–40	0.190995	0.184044	0.198146
30–50	0.199181	0.192279	0.206267
40–50	0.157307	0.150211	0.164674
20–50	0.242074	0.235298	0.248982

Panel B: Disposable Income, Men

Age Range	Correlation	Lower Bound, 95% Confidence Interval	Upper Bound, 95% Confidence Interval
20–30	0.261794	0.255065	0.268638
20–40	0.26661	0.259859	0.273472
30–40	0.247932	0.241034	0.254962
30–50	0.291819	0.285162	0.298566
40–50	0.249569	0.24274	0.256524
20–50	0.301202	0.294577	0.307912

Panel C: Earnings, Women

Age Range	Correlation	Lower Bound, 95% Confidence Interval	Upper Bound, 95% Confidence Interval
20-30	0.171554	0.164996	0.178318
20-40	0.196526	0.189831	0.203399
30-40	0.131485	0.124612	0.138677
30-50	0.163177	0.156178	0.170426
40-50	0.127505	0.120273	0.135105
20-50	0.214694	0.207944	0.221601

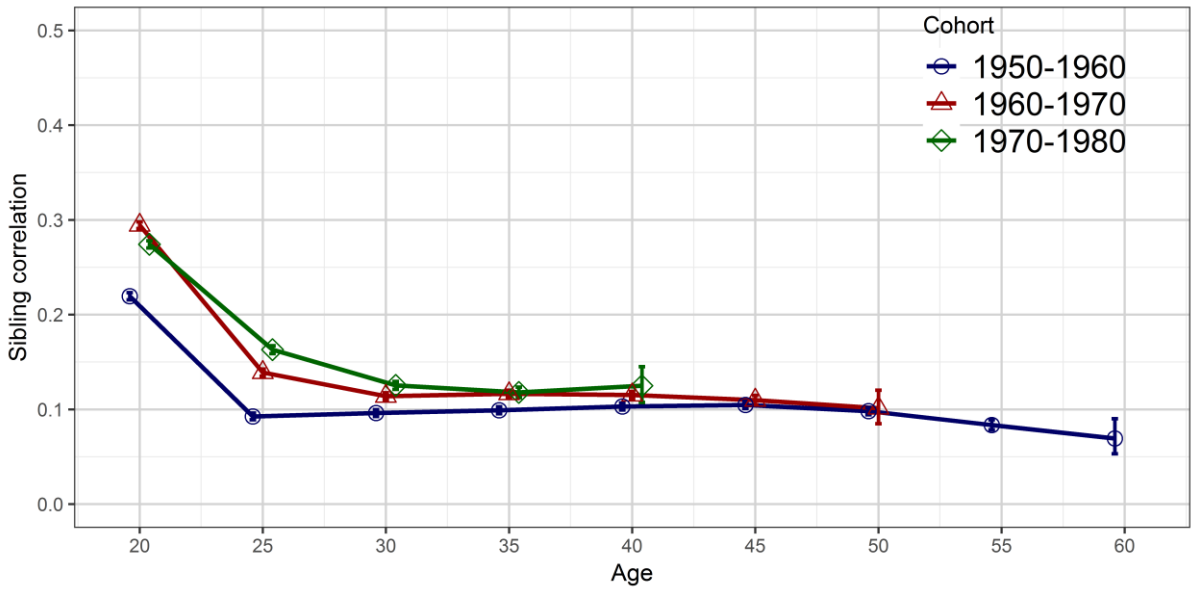
Panel D: Disposable Income, Women

Age Range	Correlation	Lower Bound, 95% Confidence Interval	Upper Bound, 95% Confidence Interval
20–30	0.154219	0.147417	0.161276
20–40	0.195796	0.188719	0.203072
30–40	0.176479	0.169057	0.184155
30–50	0.234172	0.226946	0.241556
40–50	0.200534	0.19333	0.207937
20–50	0.243304	0.236309	0.250437

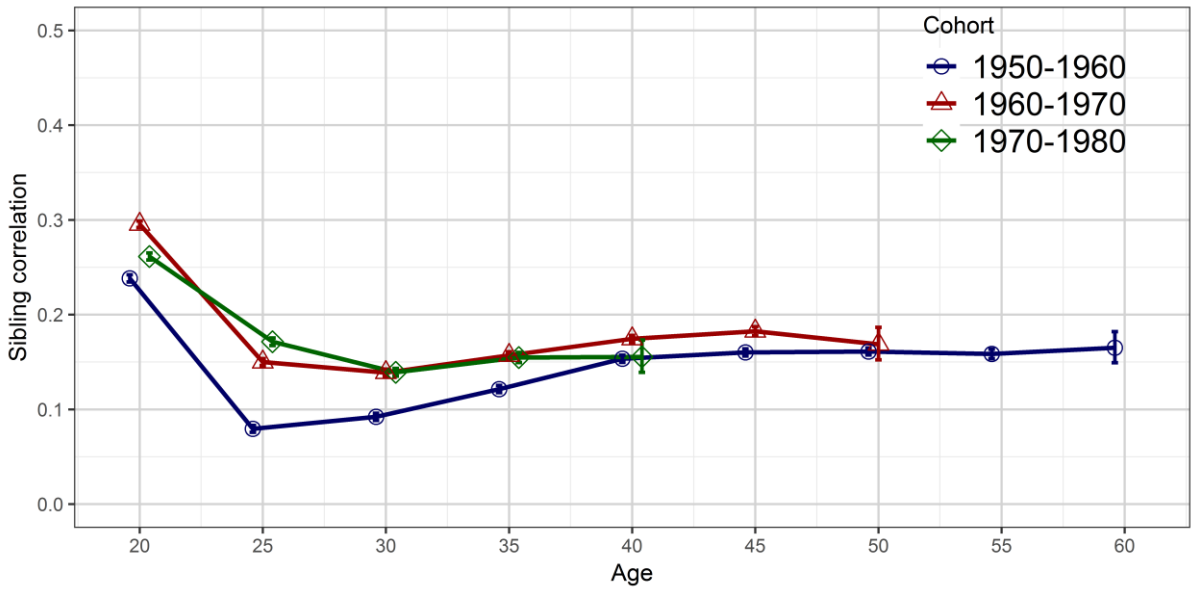
FIGURES

Figure S1. Sibling Correlations in Earnings and Disposable Income, Men and Women Combined

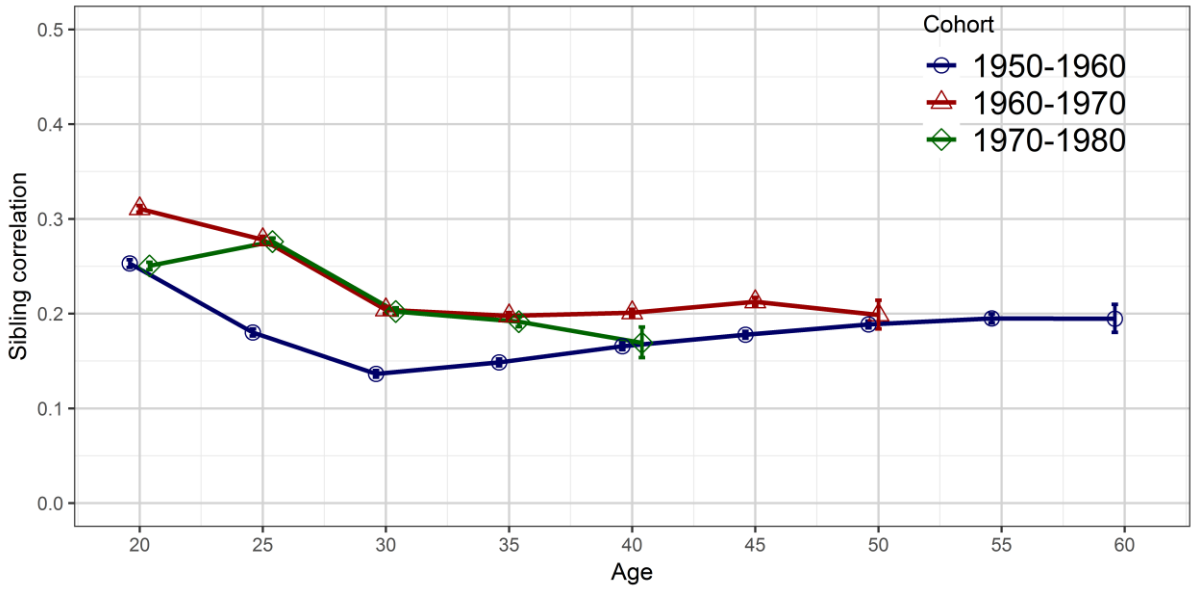
Panel A: 5-Year-Average, Earnings



Panel B: 5-Year-Average, Disposable Income



Panel C: Accumulated, Earnings



Panel D: Accumulated, Disposable Income

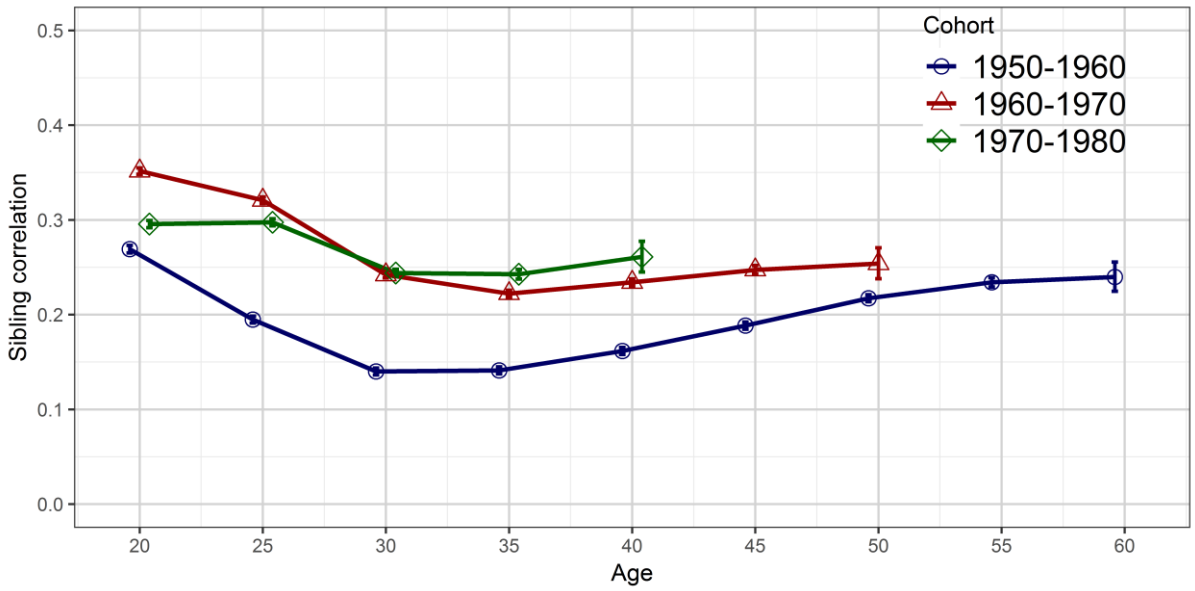
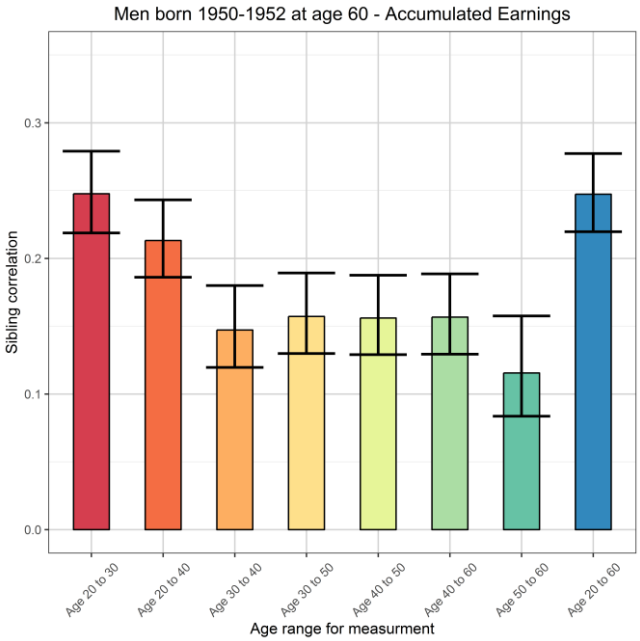
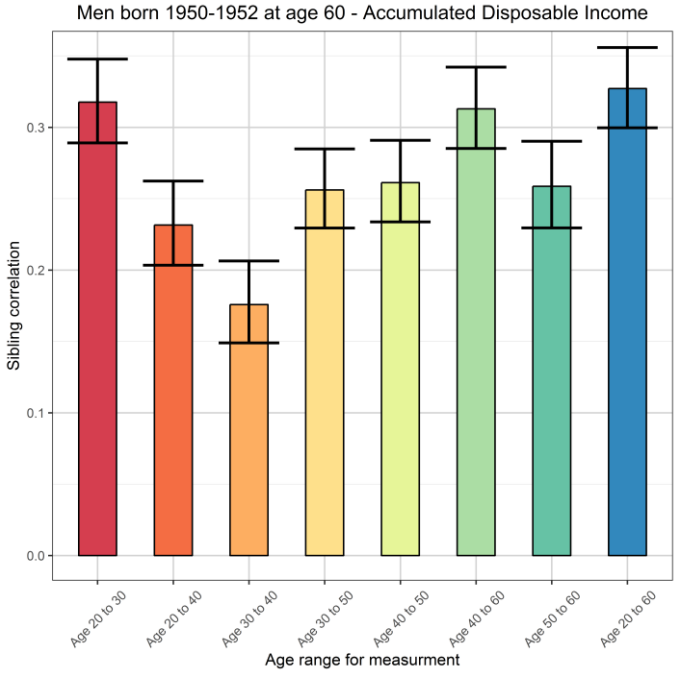


Figure S2. Approximations of Sibling Correlations in Accumulated Income at Age 60 with Incomplete Information

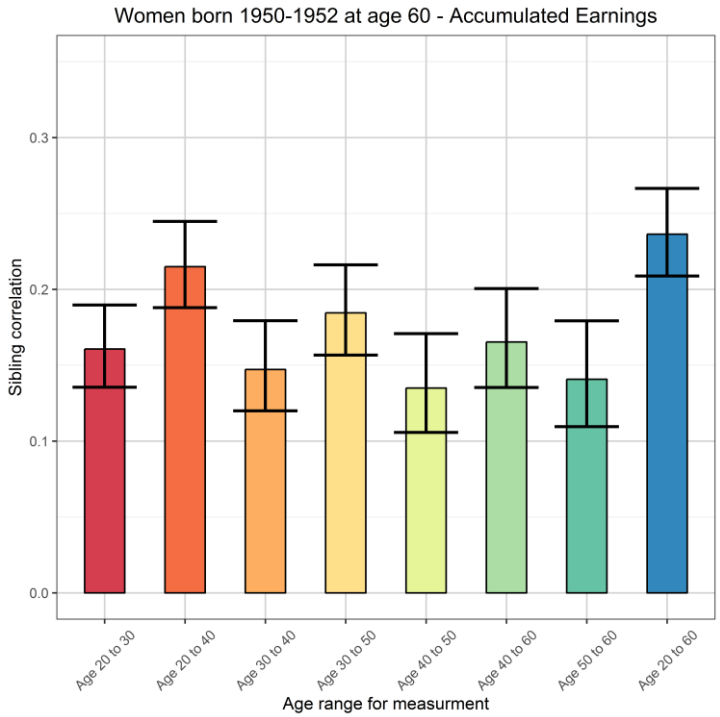
Panel A: Earnings, Men



Panel B: Disposable Income, Men



Panel C: Earnings, Women



Panel D: Disposable Income, Women