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Intergenerational mobility and Sweden's social structure 1865-2015

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Patterns of Persistence

Intergenerational mobility and Sweden's social structure 1865-2015

ELIEN DALMAN

LUND STUDIES IN ECONOMIC HISTORY 108 | LUND UNIVERSITY



Patterns of Persistence

Intergenerational mobility and Sweden's social structure 1865-2015

Patterns of Persistence

Intergenerational mobility and Sweden's social structure
1865-2015

Elien Dalman



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MADE IN SWEDEN 

Man is born free, but is everywhere in chains

The social pact, far from destroying natural equality, substitutes, on the contrary, a moral and lawful equality for whatever physical inequality that nature may have imposed on mankind; so that however unequal in strength and intelligence, men become equal by covenant and by right.

Jean-Jacques Rousseau (1762), The Social Contract

In an open world, success depends on education, on equipping yourself to compete and win in a global economy. This means that national governments must ensure that everyone has an equal chance to get the education on which success depends. But it also means that those who land on top come to believe that they deserve their success. And, if opportunities are truly equal, it means that those who are left behind deserve their fate as well.

Among the winners, it generates hubris; among the losers, humiliation and resentment... it encourages the winners to consider their success their own doing, a measure of their virtue — and to look down upon those less fortunate than themselves... It leaves little room for the solidarity that can arise when we reflect on the contingency of our talents and fortunes. This is what makes merit a kind of tyranny, or unjust rule.

Michael Sandel (2020), The Tyranny of Merit

Table of Contents

Acknowledgements	12
List of Papers	14
Author's contribution to the papers	14
Introduction	15
Motivation, aim, and contribution	15
Research questions	19
Clarifications	20
Limitations	21
Economic-historical context	23
Structural transformation of the Swedish economy	23
Institutions for equal opportunities	32
Background, theory, and previous research	35
Social stratification in the long run	35
Intergenerational persistence in the long run	38
Types of intergenerational persistence	39
Social origin, surname, and family types: heterogeneity in intergenerational persistence	42
Mechanisms behind intergenerational mobility	52
The impact of institutions for equal opportunities	55
Data and methods	63
Census and register data across time	63
Research design and statistical methodology	66
Measuring dimensions of social status across time	67
Summary of papers	75
Paper I. Social stratification of men and women in Sweden 1880-2015.	75
Paper II. A Schumpeter hotel? Surname status persistence in Sweden 1880-2015	76
Paper III. The impact of mothers. Intergenerational mobility in Sweden 1865-2015.	77
Paper IV. Intergenerational status persistence in Sweden 1865-2015. The impact of occupational and surname status.	78

Concluding discussion.....	80
References	86
Social stratification of men and women in Sweden 1880-2015	107
Introduction	108
Background	111
Structural transformations of the Swedish economy	111
Women in the workforce	112
The social structure of the Swedish workforce.....	114
Data and Methods.....	117
Measuring social stratification: class and status	118
Results	122
Structural transformation.....	122
Social class of men and women.....	129
Occupational status of men and women	134
Occupational status and social class by gender	136
Microclass of men and women.....	140
Concluding discussion.....	148
References	152
Appendix.....	158
Creating a uniform occupational coding across time	158
Appendix: figures and tables	161
A Schumpeter Hotel? Surname status Persistence in Sweden 1880-2016.....	171
Introduction	172
The surname approach	175
Swedish surname practices.....	180
Data and Methods.....	186
Data and analytical sample	186
Measuring social status.....	187
Measuring the informational content of surnames	190
Measuring surname inequality and persistence	191
Results	195
Latent factor or group-level intergenerational persistence?	195
Surname status inequality.....	200
Surname status persistence	203
Concluding discussion.....	207
References	210
Appendix	219

The informational content of surnames and surname groups by rarity	219
Sensitivity analysis	220
Tables and figures.....	223
The impact of mothers. Intergenerational mobility in Sweden 1865-2015....	237
Introduction	238
Background	241
Families as units of production and reproduction.....	241
Institutions for equal opportunities.....	244
Who marries whom?.....	245
Different measures of family social origin and their rationale	246
Compensation or multiplication?.....	247
Gender and mobility	249
Previous research.....	250
Synthesis	253
Data	256
Study Design	258
Results	263
Mobility patterns and trends by gender	263
Father-child mobility in the long run.....	265
Mobility patterns and trends by family type.....	267
The impact of mothers and fathers by social origin	270
Accumulation of father and mother social origin	273
Concluding discussion.....	276
References	280
Appendix	288
Intergenerational Status Persistence in Sweden 1865-2015. The Impact of Occupational and Surname Status.....	295
Introduction	296
Background	298
Structural transformations and institutions for equal opportunities...298	
Social status in a changing social structure	298
Swedish surname practices and surname groups.....	301
Different stories on intergenerational persistence over the long run .304	
What kind of mobility?.....	306
Data	308
Study Design	312
Results	317

Surname groups as a status indicator: intermarriage	317
Stable intergenerational status correlations in the long run.....	319
Reduced but persistent surname group premia.....	323
Long-run mobility trends differ by surname group	326
Concluding discussion.....	331
References	337
Appendix	345

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Starting my PhD trajectory at Economic History in Lund meant a radical change in social environment. Not only did I move to a country I had never lived in before, but I also left all my friends and family behind. I am deeply grateful to my main supervisor Martin Dribe – and anyone else who was involved in my selection for the PhD position – for giving me this opportunity not only to develop myself academically, but also to start a new life: with new friends, a new home country, and a new family. For various reasons my life in the Netherlands had been strained before I went to Sweden, and I was incredibly lucky to meet so many warm and welcoming people after arriving in Sweden. Without them, and without this change in environment, I am certain that I would not have been able to write this book.

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I see my PhD trajectory as my first encounter with proper academic work; before starting the PhD, I rather approached academia as a tourist, trying to experience as many of the highlights of as many disciplines as possible. Changing this was hard work, but it was also highly rewarding. I was lucky to get the opportunity to learn from three supervisors with very distinct competences. From Björn Eriksson, my assistant supervisor during my first years, I learned how to communicate research – and the archaeologist's approach to historical data. My main supervisor Martin Dribe has a unique ability to strike the right balance between teaching his PhD students how to be an independent researcher and being promptly available if and when necessary. Even if at times I disagreed in the short term, I have taken to heart many of the things you have taught me about Sweden, social stratification, and economic history. Without my assistant supervisor Annika Elwert, I would not have been able to complete this dissertation. Thank you for your emotional support and for your valuable feedback on my ideas – I am afraid I have placed more than a fair share of the emotional burden of completing my PhD on you.

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Over the past pandemic years, I have often been working from home. I live close to Sweden's oldest building: the church of Dalby. During workdays I would regularly take a short walk and pass this church – with its beautiful view over the Scanian countryside – and its cemetery. On most of the gravestones on the cemetery four things are mentioned: a person's name, their dates of birth and death, their gender, and their occupations. Names, occupations, gender, and the era in which you live, are defining characteristics of an individual in society. They are also the main characters in this dissertation, and I use them to describe the Swedish social structure and patterns of persistence therein. I hope you enjoy reading it!

List of Papers

- I. Dalman, Elien. Social stratification of men and women in Sweden 1880-2015. *Unpublished manuscript.*
- II. Dalman, Elien, Dribe, Martin & Eriksson, Björn. A Schumpeter hotel? Surname status persistence in Sweden 1880-2015. *Unpublished manuscript.*
- III. Dalman, Elien. The impact of mothers. Intergenerational mobility in Sweden 1865-2015. *Unpublished manuscript.*
- IV. Dalman, Elien. Intergenerational status persistence in Sweden 1865-2015. The impact of occupational and surname status. *Unpublished manuscript.*

Author's contribution to the papers

- II. ED led the study design, carried out the practical part of the study, in which BE contributed with the linking of historical census data. ED interpreted the results together with the co-authors and led the writing.

Introduction

Motivation, aim, and contribution

Our life chances are not fully equal, but depend on our family background. Those born into lower classes, with less educated or poorer parents, are less likely to end up in high status positions, than those with richer, more educated, or higher-class parents. At the other end those born into lower classes, with less educated or poorer parents, are more likely to end up in low status positions. Despite widely supported political efforts to equalize opportunities, such differences are seen across the world and across time. In this dissertation I ask how different dimensions of social status, such as the prestige associated with one's occupation, interact to shape inequalities of opportunity over the course of economic and institutional development.

Socio-economic life chances are commonly believed to have been unequal in pre-industrial European 'ascription' societies; those born into the nobility or bourgeoisie had better chances to 'get ahead' in life than those born as children of peasants. There were clear differences, legally, politically, economically, and socially, between different social strata. These strata shaped the political and social hierarchy in pre-industrial Sweden, as in many other European countries (Ågren 2017; Stadin 2004). Nobility and the clergy formed a ruling elite, followed by an – in the nineteenth century expanding – urban upper class distinguished by their educational or economic position. Below them on the social ladder was the majority population of farmers, followed by landless laborers. Similarly, socio-economic life chances differed substantially by gender and marital status in a society dominated by patriarchic nuclear families which served both as units of production and reproduction. Women's work outside of the family was largely restricted to a period in young adulthood, or dependent upon agreement of the head of household (father or husband). Head of household social class or occupational status formed another dimension of distinction leading to diverging socio-economic outcomes in adulthood, for example through access to training (guilds). On the other hand, in a substantially less globalized world Sweden, as many pre-industrial societies, had an ethnically rather homogeneous population (with small Sámi and Finnish minorities in the north) and very few international immigrants, so that there was little room for distinct socio-economic life chances by ethnicity or migrant status.

Today, however, most of these dimensions of social status are no longer formally connected with different opportunities.¹ In modern societies, the ideal is for status positions to be attained through ‘achievement’ rather than ‘ascription’ (see e.g. Kerr et al. 2000; Lipset and Zetterberg 1959). This focus on meritocratic achievement is often connected to the idea of ‘equality of opportunity’ (Roemer 1998); socio-economic outcomes may not be the same, but at some point in time all (children) should have equal opportunities to achieve any status position suiting their abilities. In a society with equality of opportunity, children may still end up in the same social status positions as their parents. Equality of opportunity does not imply high ‘intergenerational mobility’; in a society with high intergenerational mobility of social status, the position of children does not resemble that of their parents much, while equality of opportunity can go alongside either high or low intergenerational mobility depending on which children end up in which positions.

That is, if we assume there to be perfect equality of opportunity in a society, this could go hand in hand with perfect immobility if children experiencing these equal opportunities ended up in the exact same status positions as their parents. The same situation of perfect equality of opportunity could also go hand in hand with perfect mobility if children do not at all perform so that they end up in similar status positions as their parents. At the start of industrialization, many contemporaries believed that industrialization and democratization would lead both to equal opportunities and high intergenerational mobility. Those from lower status backgrounds would aspire to get ahead in life and would have the chance and abilities to do so:

There is still a class of menials and a class of masters, but these classes are not always composed of the same individuals, still less of the same families; and those who command are not more secure of perpetuity than those who obey [...] At any moment a servant may become a master, and he aspires to rise to that condition.

Alexis de Tocqueville (2006 [1838]), *Democracy in America. Volume 2.*

Such increases in intergenerational mobility and in the importance of own achievements during economic and institutional development are also expected according to modernization theory in sociology (Treiman 1970). The idea of a meritocracy, with own achievement determining status attainment, has been described as naïve by some recent scholars from different backgrounds (see e.g. Sandel 2020). Based on a novel empirical approach, American economic historian

¹ In Sweden, only one of these dimensions of parental background creates legal inequalities between individuals in the twenty-first century: migrant status (Shachar 2009). Citizenship rights are limited to those with Swedish-born parents or new applicants fulfilling other restrictive conditions. Those without citizenship cannot vote in national elections, and those without other permits are not allowed to participate in society at all, for example through employment.

Gregory Clark in his polemic work *The Son Also Rises* (2014) claims that intergenerational mobility is as low today as it was historically.

The work by Gregory Clark, and many other recent studies showing lower intergenerational mobility than previously assumed, revived the debate on the level of intergenerational persistence experienced in different societies today and in the past. To what extent is your social status affected by your family background, and does this change over the course of economic and institutional development? And following from this, as different approaches to this question have given different answers: How should we define family background? Which information on which family members should be contained in ‘social status origin’? Does what constitutes your ‘social status origin’ change as society transforms structurally and institutionally? These questions are the main focus of this dissertation.

Why do I study intergenerational persistence? What do I hope to find; what level of intergenerational persistence is desirable? Here again, the answer depends strongly on the question: intergenerational persistence *of what*? Setting a desired level for overall intergenerational persistence between parents and their children is not the task of a researcher, but rather the task of a politician based on ethical considerations. However, as the debate on ‘ascription’ and ‘achievement’ shows, intergenerational persistence at the group level is substantively different from intergenerational mobility at the level of individual families. Persistence at the level of social groups creates tangible social inequalities that can be linked to a society’s wellbeing in a different way from persistence at the level of individual families. For example, persistent inequalities between social groups lower social trust and undermine social cohesion (Putnam 2000; Rothstein 1998; Savage 2021). Persistence at the level of social groups is hard to link to an individual’s own achievements. Disentangling intergenerational persistence related to social group membership from parent-child mobility (in terms of occupational status) is one of the main aims of this dissertation. The types of group membership studied are pre-industrial social strata (surname groups), gender, and social status. The latter means that I allow for heterogeneity in mobility levels by social status origin.

The overarching contribution of this dissertation is to show how the changing social structure – and social groups therein – are related to levels and patterns of intergenerational status persistence. I study such changes over the course of long-term economic and institutional development. By studying different dimensions of social status origin that may affect child status attainment, I distinguish between different types of intergenerational persistence, which differ in their consequences and desirability. Some social status dimensions, such as gender, migrant status, or pre-industrial social strata, would not be associated with differences in child status attainment in a ‘meritocratic’ society, as they do not represent traits resulting in differential achievement at the group level. Intergenerational persistence of social status as determined by such group belonging reflects ‘ascription’ rather than ‘achievement’. In a meritocratic society we would not, on average, expect men to

perform better or worse than women, or those with a nobility origin centuries ago, on average, to perform better than those with a farming origin centuries ago.²

This dissertation specifically links the social status of these social groups to occupational intergenerational mobility and demonstrates how intergenerational mobility is mediated in important ways by such group belonging. As the relevance of different social groups in shaping the social structure changes over time, I expect intergenerational persistence of social status to reflect different patterns of persistence in different contexts. One of the major questions I ask, by distinguishing pre-industrial social strata, is to what extent inequalities related to social group belonging persist over time. I find high persistence of pre-industrial social strata (paper two) and, historically, an important mediating role of these social strata in determining levels of occupational intergenerational mobility (paper four). Both at the level of individual families, and as a group, higher social strata experience lower levels of mobility than the majority population in the late nineteenth and early twentieth century. These high-status groups manage to maintain their occupational structure as the rest of society converges to the same occupational structure with economic development.

Changes in family type and gender norms, and their implications for the composition of social origin, could have important consequences not only for our understanding of time trends in mobility but also for our understanding of differences between countries in mobility levels (Beller 2009). In previous research, Sweden is often found to experience increasing intergenerational mobility among cohorts born between ca. 1900 and 1972, and more so than other European countries (e.g. Breen 2004; Breen and Müller 2020; Erikson and Goldthorpe 1992). These results are however based on a one-parent conceptualization of family origin, which becomes increasingly ill-suited to capture parental social status origin - especially in Sweden, a country where mothers' labor force participation expanded both relatively early and rapidly (Stanfors and Goldscheider 2017; Thaning and Hällsten 2020). I find patterns of intergenerational mobility to differ substantially as family type and gender norms change; a lowering of father-child associations as Sweden transitions to a dual-earner society goes hand in hand with higher mother-child associations (paper three).

I first study how the Swedish social structure changes over the course of institutional and economic development (paper one). In this study I cover different dimensions of occupation-based social stratification, describe how they relate to each other

² Even in the first generation, attaining nobility status did not reflect abilities paying off in the labor market today, but, for example, braveness on the battlefield. At least formally, what is rewarded and highly regarded in society changed as pre-industrial institutions were replaced by democratic welfare states (e.g. Tönnies 1966 [1931]; Weber 1978a [1921]).

empirically, how this changes over the long term, and how it differs by gender. I study both social class, occupational status, and ‘microclasses’.

I find that overall levels of occupational intergenerational mobility are highly stable in the long run; at the surface, occupational mobility seems surprisingly unaffected by the roll-out of institutions for equal opportunities (cf. Beller and Hout 2006; Esping-Andersen 2015), or by sharp reductions in economic inequality (cf. “Great Gatsby Curve”, see Corak 2013; DiPrete 2020). In contrast to income mobility, long-run levels of occupational mobility in Sweden are similar to those in the United States (Song et al. 2020). This finding is not new and the discrepancy between income mobility on the one hand, and educational and occupational mobility on the other hand, is often referred to as the “mobility paradox”: Scandinavian countries, while more equal economically, display largely the same opportunity structure in terms of other dimensions of social status as less economically equal countries (Beller and Hout 2006; Breen and Jonsson 2005; Breen, Mood, and Jonsson 2016).

Seeing these levels of intergenerational mobility in conjunction with important social and structural transformations suggests that stable levels of occupational intergenerational mobility might indicate substantial decreases in terms of broader intergenerational persistence of social status. Most importantly, with economic and institutional development, the social structure becomes more varied and captures social status differences increasingly well – first as men enter the non-farming workforce during industrialization, and then as women enter the formal workforce. Moreover, the social groups studied in this dissertation – pre-industrial social strata and gender – become less important in shaping intergenerational mobility in Sweden over time.

An important qualification to this general conclusion of long-run reductions in intergenerational persistence is the arising status gap, observed in the different papers, between Swedish-born and foreign-born workers; this new dimension of social stratification becomes increasingly important in shaping patterns of persistence in the twenty-first century.

Research questions

The first paper focuses on the social structure, and answers the research questions:

1. How do different occupational dimensions of social status interact to shape the Swedish social structure over the course of economic and institutional development? How does this differ by gender?

Paper two to four focus on intergenerational persistence, and each reflect in different ways upon the overarching questions: Do levels and patterns of intergenerational persistence of social status change over the course of economic and institutional

development? Does the importance for intergenerational persistence of different dimensions of social status origin change over time?

The main research questions in each of the respective papers are:

2. To what extent does surname status persistence reflect lineages or pre-industrial social status origins? Do levels and patterns of surname status inequality and persistence change over the course of economic and institutional development?
3. Does the extent to which fathers' and mothers' occupational status interact and affect children's status attainment change over the course of economic and institutional development? Does this differ between production units, male breadwinner, and dual-earner family types?
4. To what extent does surname status persistence reflect, and interact with, intergenerational mobility in occupational status? Does this change over the course of economic and institutional development? And does this differ by social status origin?

Clarifications

The dissertation revolves around different concepts relating to 'social status' and 'intergenerational persistence'. When referring to 'social status', I have a Weberian definition of the concept in mind; any marker of social or cultural distinction, often resulting in economic distinction – at least in the long run, and defined primarily through patterns of social interaction, can be referred to as 'social status' (Weber 1978a [1921]). Occupational status is an example of social status, as is 'surname status' (see later sections), gender, educational attainment, or ethnicity. The social status concept is more specific than the compound term 'socioeconomic status' also used in the dissertation. With socioeconomic status, I refer to social status as well as economic dimensions of stratification, such as Weberian social class, income, or wealth. Economic distinction is generally associated with social or cultural distinction, so that social classes often also form social status groups. But social status differences are not necessarily associated with economic inequality. The term 'social stratification' refers to a society's structure in terms of social status, and 'social inequality' to a hierarchical dimension thereof. 'Economic stratification' or, more commonly used, 'economic inequality' refers to differences in terms of economic status (income or wealth), which are inherently hierarchical.

The term 'intergenerational persistence' is used to encompass both 'intergenerational mobility' and other forms of socioeconomic status persistence over generations, such as persistence at the level of social groups rather than individual families. 'Intergenerational mobility' refers to (dis)similarities between parents and their children in one specific dimension of socioeconomic status. As a

form of intergenerational mobility, ‘social mobility’ is used to refer to occupation-based social status mobility, either in terms of social class or in terms of occupational status. For clarifications of other mobility concepts, I refer to the subsection on ‘types of intergenerational mobility’ in the background section.

Limitations

Occupational data, besides surname types, forms my main source of information about society’s social structure. I do not study other important dimensions of social stratification such as educational attainment – which over the early decades of my study period was not so varied for most of the Swedish population, or economic dimensions such as income and wealth (but see the discussions on their development over time in the economic historical context section). The main reason for focusing on occupational data is data availability – individual-level information on income, wealth, or educational attainment is not available historically in the same way as occupational information. But arguably, occupation is also the most time-consistent and inherently meaningful dimension of social stratification, both over the life-course and over the course of Sweden’s economic and institutional development. I complement occupational information with surname types, which reflect other dimensions of social status in Sweden historically. For further reflections on both occupational and surname status, see the later sections on ‘social stratification in the long run’ and ‘measuring dimensions of social status across time’.

This dissertation spans a long time period, yet it does not fully cover the Swedish economic and institutional developments from the start of industrialization until today. I use individual-level data covering those living in Sweden across the period 1880-2016 and born from around 1810 until 1985. I observe children in parent-child pairs in cohorts born since 1865. These first cohorts of children experience Sweden’s industrialization as (young) adults but complete their occupational careers in an industrialized country. This means that I do not observe parent-child cohorts growing up and growing old in a pre-industrial society, as would have been the case with census material from 1860 or 1870 – including cohorts born from 1845. It would be interesting to extend this study further back in time using the Swedish censuses of 1860 and 1870, which have in part been digitized by the Swedish National Archives (*Riksarkivet*) but, to my knowledge, have not been standardized or linked to more recent censuses. I also do not observe the Swedish population between 1910 and 1950. Parts of the 1930 Swedish census have recently been digitized by the Swedish National Archives, within the *Swedpop* project used for other data sources in this dissertation.

For the most recent period and contemporary levels of intergenerational mobility, I am limited by my empirical strategy to children reaching a point in their career where occupation reflects social status reasonably well, which means that I cannot include cohorts born after 1985. The life course of cohorts born today likely differs

substantially from that of cohorts born in the 1980s, which is also in some respects important for intergenerational mobility. The Swedish educational system has for example been reformed substantially since the late 1980s, with reduced educational equality as a result (Fjellman, Yang Hansen, and Beach 2019; Wennström 2020).

Economic-historical context

Several changes in the make-up of Swedish society over the past hundred-and-fifty years are reflected in levels and patterns of intergenerational persistence and social stratification. In this section, I summarize structural transformations of the Swedish economy, including sectoral change, economic growth, the changing institutions of family and work, changes in economic stratification, and the changing composition of individuals in the Swedish workforce in terms of migration background and gender. I also cover the emergence and expansion of institutions for equal opportunities. I situate these aspects of Swedish economic history, which form the context in which intergenerational persistence is studied, in their international context.

Structural transformation of the Swedish economy

Swedish industrialization occurred rapidly and took off during the last quarter of the nineteenth century. From 1890 until the middle of the twentieth century, the country outpaced the rest of the world in terms of economic growth, and especially in the earlier period in terms of real wage growth (Schön 2012).³ Economic growth in Sweden and other world regions is shown in figure 1 as reflected by the gross domestic product (based on internationally comparable data from the Maddison project, Bolt and Van Zanden 2020). Until 1850, the Swedish population had been largely agricultural and demand for household goods had been met by homecrafts production. Over a century, this changed entirely. Due in part to high real wage growth in the first phase of industrialization market consumption grew rapidly.

Rapid economic growth followed educational expansion and the growth of human capital among the Swedish population, as primary education expanded (Goldin and Katz 2008; Ljungberg and Nilsson 2009). In the second half of the twentieth century, after the introduction of comprehensive schooling, higher education also expanded. This human capital growth is shown in figure 1 and discussed in greater detail in the section on institutions for equal opportunities.

³ See paper 1, and Schön 2012, p. 126, 206, 297, 331, 403 for statistics in this section.

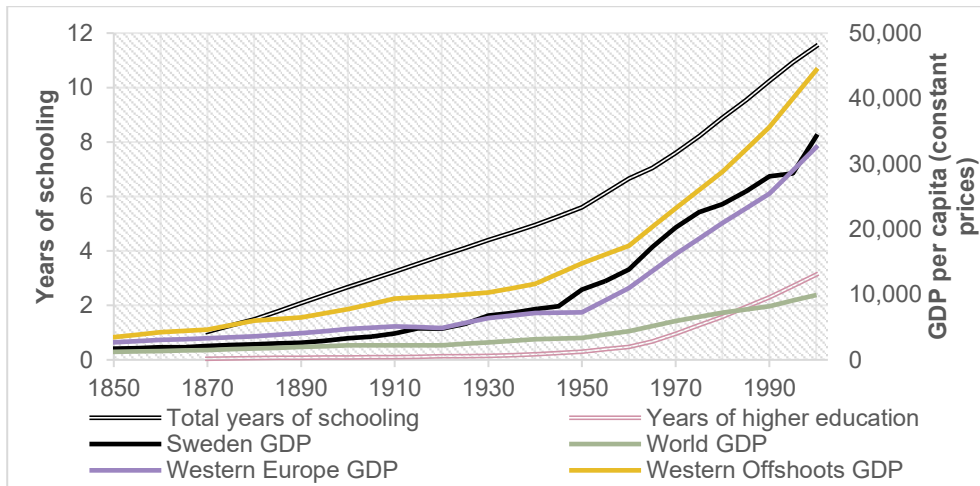


Figure 1 Growth of gross domestic product per capita and human capital in Sweden 1850-2000

Sources: Average years of schooling in the population aged 15-65, with 'higher education' as upper secondary, vocational, or tertiary education (Ljungberg and Nilsson 2009). GDP per capita (in constant 2011 international dollars) for Sweden and other world regions which industrialized early, with "Western Offshoots" including: United States, Canada, Australia, and New Zealand (Bolt and Van Zanden 2020).

As economic growth accelerated and market consumption grew, the employment structure changed fundamentally. In the late nineteenth century, most of the Swedish formal workforce was composed of farmers and general, low- and unskilled laborers. These two groups disappeared over the course of the twentieth century in favor of high-skilled and non-manual workers (see figure 2). In 1850, about half of Sweden's national product was generated in the agricultural sector, and the employment share was substantially higher. The share of agriculture in GDP had decreased to one-third by 1890, when 58% of the working population was still employed in the agricultural sector. Between 1890 and 1950, employment in industrial sectors (industry, crafts, construction, transport and communications) increased from 27% to 50% of the workforce. Compared to the US and other European countries, the transition from the primary to secondary sector happened relatively late in Sweden, but Sweden underwent a decisive industrial phase before transitioning to a post-industrial society – unlike some other late industrializers (Schön 2012, and paper one in this dissertation).

Thus, the late nineteenth and first half of the twentieth century marked an important shift from predominantly agricultural to predominantly industrial for the Swedish workforce (among men, see paper one). During the latter half of the twentieth century, the Swedish economy became post-industrial, as services rather than industry came to dominate the labor market of men as well as women. Women in the workforce had always primarily worked in the service sector (see paper one). The expansion of the service sector among men started with industrialization and

gradually progressed over the entire period 1880-2015. By the twenty-first century, the majority of the Swedish workforce – and the majority of men therein – were occupied in the service sector. Structural transformations during the period of 1880-2015 did not only entail sectoral change, but for the Swedish workforce they also meant general occupational upgrading, a shift from medium-skilled to high-skilled work, and a transition from manual to non-manual work (see paper one).

These structural transformations, and the growth of economic and human capital, shape intergenerational persistence in important ways. Their potential link to intergenerational persistence is discussed in the background, theory and previous research section, while actual findings are summarized in the paper summaries.

Changing institutions of family and work

Women's and mothers' formal engagement in the labor force increased substantially during the twentieth century, in Sweden as in many other countries (Goldin 1995; Stanfors and Goldscheider 2017). Increases in formal work reflect both real increases in productive work outside of the household, and formalization of work more generally. Before industrialization, the family often formed a production (as well as a reproductive) unit, and while both men and women worked, only the occupation of the head of household was formally registered (for example among proprietors, artisans, or farmers; see e.g. Goldin 1979; Nyberg 1994). In fact, in Sweden, women's labor force participation follows a U-shaped curve over the course of economic development – first decreasing during industrialization as the male breadwinner family type takes hold, and then increasing with the growth of the tertiary sector (cf. Goldin 1995; see e.g. Molinder 2021; Stanfors 2014).

Sweden forms a special case in following Goldin's hypothesized U-shaped trend, in the US or several more recently developing countries, increases in women's gainful employment have stalled in more recent decades, rather following an S-shaped trend. It is for these contexts hypothesized that the intergenerational transmission of gender attitudes and norms encourage women to (not) enter the formal labor force (Luke 2021).

Families observed in the late nineteenth century – the era of the production unit family type – are characterized by a high reproductive workload; marital fertility for these cohorts lies around four to five children per woman (Dribe and Scalone 2014). Both the productive nature of family units, and reproductive activity of family units, decrease in subsequent cohorts as Sweden experienced the first demographic transition and industrialized.

In the male breadwinner family type, societal gender norms promoted work inside the home for women, and work outside the home for men ('separate spheres', see e.g. Cherlin 2012; Rosaldo, Lamphere, and Bamberger 1974). In male breadwinner families, homemakers are more important than breadwinners for socialization and transmission of cultural resources (Hess and Shipman 1965; Kalmijn 1994; Marks

2008). With rising educational attainment, automatization of housework, and decreasing fertility, gender norms around women’s work shift and women’s formal work increases (Luke 2021; Stanfors and Goldscheider 2017). Especially during the 1970s, women’s labor force participation expanded rapidly in Sweden, and a dual-earner family norm was established. This particularly rapid and substantial expansion of women’s and mothers’ work is likely related to generous Swedish family policies introduced around this time (Lewis and Åström 1992; Stanfors and Goldscheider 2017).

These changing institutions of family and work are summarized in figure 2, which shows fertility rates, the share of women in the formal workforce, and the share of men in typical pre-industrial occupations (farming and general laborers). The expansion of human capital and development of new technologies associated with industrialization – as shown in figure 1 – resulted in men’s work shifting away from these two categories, is associated with declining fertility, and in the long run with increases in women’s formal work.

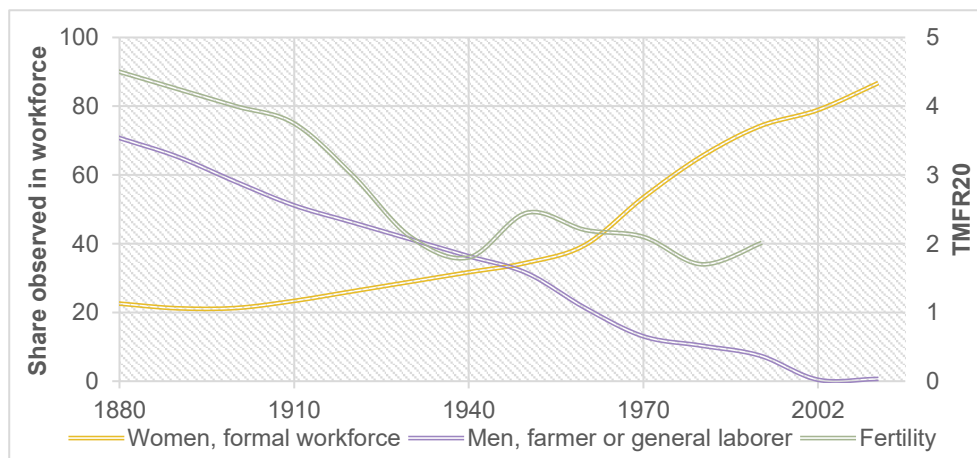


Figure 2 Demographic transition and men’s and women’s work in Sweden 1880-2015
 Sources: own calculations for observed labor force participations (see paper one); total marital fertility rate per woman aged 20-50 observed at 10-year intervals, based on Dribe and Scalone 2014.

The male breadwinner family is criticized to some extent by contemporaries; during the 1930s, sociologist and politician Alva Myrdal raises the “general issue” of combining gainful employment with ‘homemaking’ activities, and thereby makes the private sphere of the family public (e.g. Ekerwald and Ekerwald 2000). Relevant in this context is that this first movement to make working motherhood possible was reserved for women occupying high status positions – in practice if not in purpose. At the same time as gender questions were primarily raised among higher (non-

manual) social classes, the demand for women's formal work was also higher in the non-manual (higher) classes (see paper one).

A few decades prior to this first expansion of women's formal labor force participation, it was also among such high-status families that fertility first declined; in the late nineteenth century, the fertility transition was initiated by the non-manual, then 'elite', classes (Dribe and Scalone 2014). Socioeconomic differences in fertility are important for our understanding of intergenerational persistence and social stratification, as they determine the composition of social origins represented in the next generation. However, in Sweden, fertility has not followed a consistent social gradient historically.

By the late nineteenth century, high-status groups led the transition to lower fertility, so that they have less children than other social origins in the early cohorts in this dissertation. Today, in contrast, fertility is higher among high-status groups in Sweden and the other Nordic countries – although among cohorts not observed in this dissertation (Jalovaara et al. 2019). Over the course of the twentieth century and across the cohorts included here, these patterns have varied by gender, followed a U-shaped pattern, and differed by parity (Dribe and Smith 2021). Generally, these fertility differences appear to have followed the changing institutions of family in work; fertility was lower among working mothers when family policies were not yet in place, higher among lower-status mothers and higher-status fathers in male breadwinner families, and is recently higher in families who are able to benefit from the institutions facilitating the combination of family and work.

The transitions in work and family life have changed both the composition of the workforce and the composition of family social origins, fundamentally. However, the role of mothers and fathers in the family and in the workforce is far from equal also in the dual-earner family type. On average, mothers are responsible for the majority of housework and childrearing activities (Evertsson and Neramo 2004; Stanfors and Goldscheider 2017). The labor force is segregated by gender, and women far more often than men work parttime (e.g. Lewis and Åström 1992). On average, the occupational status of women is somewhat lower than that of men, and women more often work in lower-skilled occupations (see paper one). Despite these differences, both the occupational status of mothers and fathers, and the way in which they interact, play an important role in defining family social background in dual-earner families (see especially paper three).

Economic inequality in Sweden: changes and contradictions

Intergenerational persistence describes the consequences of inequality in terms of duration. The consequences of inequality, and of intergenerational persistence, are also determined by the levels of inequality; whether you are or aren't socially mobile becomes more or less consequential depending on the difference it makes for your life outcomes. Inequality – as intergenerational persistence – is clearly

multidimensional (status, class, earnings, wealth, ethnicity, etc.). I describe economic inequality, in terms of income and wealth, here. I describe its development over the study period. Inequality in terms of other dimensions of social stratification is described in paper one.

The Nordic countries, including Sweden, are widely seen as particularly equal and egalitarian, at least since the emergence of the welfare state (Esping-Andersen 2015). Whether Swedish equality is an historical heritage, or has arisen with the emergence of the welfare state, has been a matter of debate (see e.g. Bengtsson 2019). Certainly, Sweden forms a special case today in the shape of its economic structure; while income inequality is low internationally, Swedish wealth inequality is very high (Pfeffer and Waitkus 2021). I discuss the potential relationships between intergenerational mobility and the income and wealth distribution in the background section, and show here the developments in terms of income and wealth inequality in Sweden over the late nineteenth to twenty-first century. These are summarized, based on the previous literature, in figure 3.

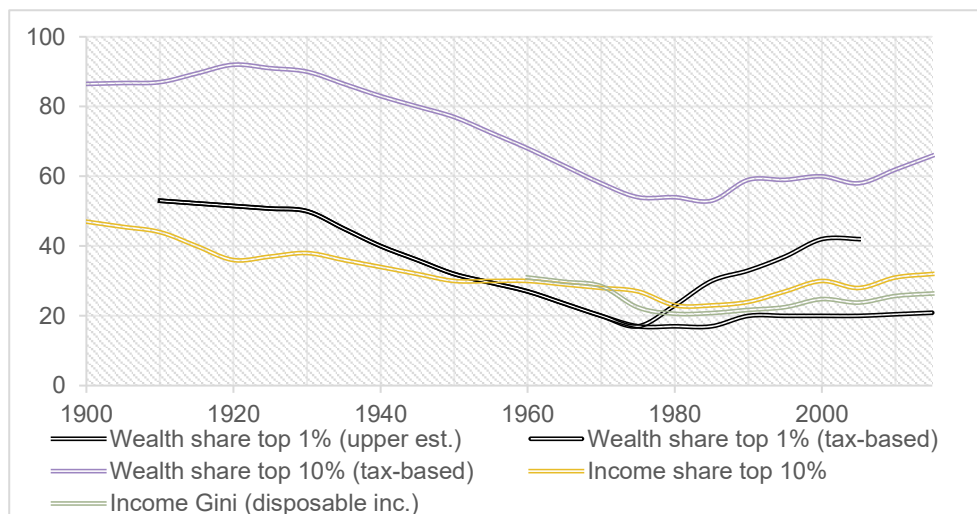


Figure 3 Income and wealth inequality in Sweden, 1900-2010

Sources: for top wealth shares until 2005 (Roine and Waldenström 2009); for estimated top wealth shares in 2012 (Lundberg and Waldenström 2018); for top income shares until 2005 (Roine and Waldenström 2008); for top income shares in 2010 and 2015 (Hammar, Roth, and Waldenström 2021); for an internationally comparable income Gini based on disposable income, SWIID v. 7 (Solt 2019).

Figure 3 shows substantial decreases in top income and wealth shares between 1910 and 1975. In 1910, the top 10% had owned over 90% of all wealth, which decreased to slightly over half of all wealth by the late 1970s (Roine and Waldenström 2009). A similar, although less radical, trend is seen for total (gross) income of the top 10% (Roine and Waldenström 2008). After 1980, income and wealth inequality appear

to be increasing, although the extent to which they increase is highly uncertain. This is demonstrated by the two black lines reflecting the wealth shares of the top 1%, with the lower bound reflecting taxed wealth and the higher bound including a variety of additional assets – held in Sweden or abroad (Roine and Waldenström 2009). After 2006, Sweden abolishes its general wealth taxes, and therefore its tax registers on wealth, making the assessment of wealth inequality uncertain (Lundberg and Waldenström 2018).

Figure 3 shows how wealth and income inequality have generally developed in parallel in Sweden. But a comparison of top 10% income and wealth shares indicates a large and persistent gap in levels; also when the full distribution is used to calculate wealth and income, Gini's wealth inequality is substantially higher than income inequality in Sweden. Although this is not shown in figure 3, the authors of these time series on top income and wealth shares have compared Swedish economic inequality to other European and 'Western Offshoot' (cf. figure 1) countries. These comparisons demonstrate that Sweden was not exceptionally equal but displayed internationally relatively high levels of inequality at the start of the twentieth century (for a study going further back in time, see e.g. Bengtsson 2019).

Today, Sweden displays relatively low levels of income inequality internationally, while wealth inequality is substantially higher than in most other European and 'Western Offshoot' countries. Sweden's comparatively high wealth inequality is primarily related to the housing market; not the share of home ownership per se, but the structure of the housing market and inequalities among home owners account for much of the international differences observed in twenty-first century wealth inequality (Pfeffer and Waitkus 2021). I show Sweden's outlier position in the twenty-first century as compared to several other countries – either European or 'Western Offshoots' – in terms of wealth and income inequality in figure 4.

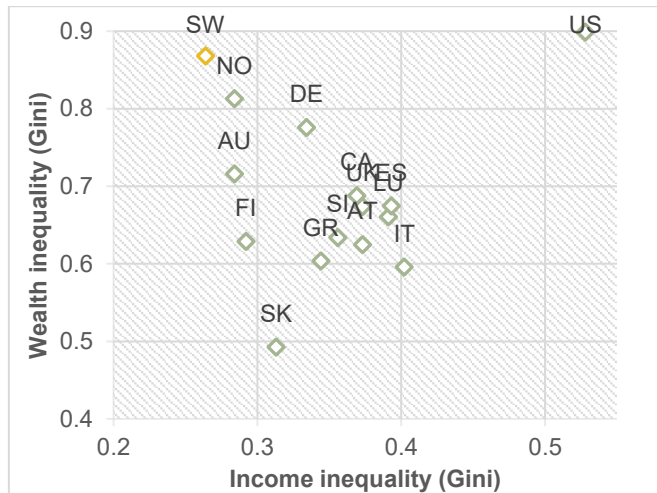


Figure 4 Income and wealth inequality in Sweden and other countries in the early 2000s

Source: own adaptation of figure 1(a) in Pfeffer and Waitkus 2021, as based on the Luxembourg Wealth Study (LWS, wave 9) including surveys conducted between 2005-2014. Standard country abbreviations (see source article).

Over recent decades, high immigration to Sweden has resulted in decreasing shares of Swedish-born among the full population. Across the income distribution, the incomes of Swedish-born have diverged from the incomes of foreign-born; foreign-born incomes are now substantially below Swedish-born incomes, while they did not differ much before 1995 (see e.g. Björklund and Waldenström 2021). At the same time as this new economic divide at the bottom arose, income shares at the very top – among fractions of a percent – have increased over recent decades. Thus an increasingly clear divide was created between a small economic ‘elite’ and the majority population (Hammar et al. 2021; Lundberg and Waldenström 2018; Roine and Waldenström 2008, 2009).

From emigration to immigration

Few migrated to Sweden from other countries before 1945. Until the First World War, Sweden was an emigration country with high rates of emigration to the Americas (see e.g. Nilsson, 2004). In the census data used in this dissertation, the share of immigrants increased slightly from 0.6% in 1880 to 1.2% in 1910 and 2.5% in 1950. Half of migrants to Sweden in this period were return migrants coming from the Americas. It is therefore likely that a large share of foreign-born individuals in this period were children of emigrated Swedes. Other migrants often came from the Nordic countries, Germany and Russia (Statistics Sweden 2016).

Since the 1930s, Sweden has become a net immigration country, with immigration exceeding emigration. Immigration to Sweden was particularly high after World

War II, around 1970, in the early 1990s and over a ten-year period around 2010 (Nilsson 2004; Statistics Sweden 2021).⁴ Since 2016, immigration to Sweden has decreased substantially (Statistics Sweden 2021). Accordingly, the share of foreign-born in my study population increased from 5% in 1960 to 12.5% in 1990 to 25% by 2015.

In the 1950s and 1960s, labor migrants came to Sweden to perform unskilled to medium-skilled manual work – mostly from Finland.⁵ This era of labor migration with liberal policies ended after restrictive legislation was introduced for non-Nordic immigrants in 1968, and immigration from Finland decreased as living standards within the Nordics had become relatively equal (Statistics Sweden 2016). In the early 1970s, immigration to Sweden decreased and was thereafter relatively stable for two decades. As the stock of immigrants increased, family reunification became an increasingly common reason to migrate to Sweden. The group coming in search of refuge also grew. Large waves of refugees resulted in high immigration levels in the early 1990s and during 2006-2016 (Statistics Sweden 2021).⁶

Higher levels of both immigration and emigration in recent decades also reflect a variety of other reasons related to globalization: international studies, family reunification (marriage), and labor migration. Migration to and from EU countries especially increased since Sweden became a member of the EU. About half of immigrants to Sweden in the twenty-first century were born in Sweden, the Nordics and the EU (Statistics Sweden 2016, 2021). Among recent Swedish cohorts, more women than men are born abroad. This is not because women are more likely to migrate, but because return migration is more common, and mortality higher, among men (Statistics Sweden 2016, 2021).

This changing composition of the increasingly large share of Sweden's population with a foreign background – immigrants as well as their (grand)children – is likely reflected in their position in the Swedish social structure, and their experience of intergenerational persistence of social status (see paper two and four).

⁴ The refugee immigration wave after World War II went largely undocumented as most refugees returned to their origin countries without registering in Sweden.

⁵ Over half of them came from Finland, but migrants also came from other Nordic countries, Germany, Austria and Italy and later Yugoslavia or Greece.

⁶ Particularly high levels of immigration in these years reflect the arrival of large numbers of refugees from Iran, Yugoslavia, Afghanistan, Iraq, Somalia, and Syria (Statistics Sweden 2021).

Institutions for equal opportunities

The welfare state

Over the period studied, democracy and the welfare state were gradually introduced in Sweden. As compared to a Diet system or census suffrage, universal suffrage may lead to policies and institutions better representing the interests and wellbeing of the full population. Importantly, the introduction of a democratic state system goes hand in hand with the introduction of legislation making citizens formally and legally equal also in other domains than voting rights. According to early philosophical work on democracy, in *The Social Contract* by Jean-Jacques Rousseau in 1762, and later writings by Alexis de Tocqueville (especially, *Democracy in America* 1835/40), democracy would have important implications for equality of opportunity and intergenerational mobility.

In 1880, Sweden was a country that had recently transitioned from a Diet system with four Estates of medieval origin (nobility, clergy, bourgeoisie, and farmers) to a two-chamber parliamentary system with voting right for men fulfilling rather strict age, income and wealth criteria. In practice, this transition was less radical, and had been accompanied by less political upheaval, than democratic revolutions in continental Europe. By the 1890s, one in four adult Swedish men were enfranchised, which was low in a contemporary European context (cf. 80% in Germany and France). Moreover, electoral participation among the enfranchised was low at one-fifth in 1872 and almost half by 1896. The first chamber was even more exclusive, with only a few thousand enfranchised men (Bengtsson 2019). In the early 1900s, the franchise was expanded, with the introduction of near-universal suffrage for men in 1907 and then women in 1919. Universal suffrage was introduced by the first liberal-socialist governing coalition.

Between 1932 and 1976, Sweden had social democratic governments who created and expanded the welfare state. The expansion of the welfare state is reflected quantitatively in increasing tax-to-GDP ratios, from 10% in the early 1930s to 50% in the 1980s (e.g. Magnusson, 2000). This gradual increase in taxation impacts the social structure as an increasing share of the population is formally working in the service sector to provide welfare, rather than performing this work informally. For example, childcare or elderly care in nursery schools or retirement homes is reflected in the formal workforce while such care provided by housewives is not.

As the welfare state expanded and taxation increased overall, wealth taxes also started increasing rapidly from the late 1930s. Sweden introduced its first wealth taxation in 1885, tax rates were initially very low (0.5%) and growing slowly – to ca. 5% by 1930. They were at their highest levels around 1970, after which they again decreased rapidly to levels more similar to those before 1950 (Du Rietz and Henrekson 2015). Sweden has no wealth taxation since 2007. Wealth taxation

reduces the possibility for intergenerational transmission of wealth and is thus related to intergenerational persistence.

Policies to reduce the dependence of children's wellbeing and opportunities on their parents' economic resources were also implemented during these decades, such as universal benefits (e.g. child allowance and free school meals) and the abolishing of fees for higher education (e.g. Breen & Jonsson, 2007). These efforts to equalize opportunity and facilitate schooling for all are associated with occupational upgrading and increases in intergenerational occupational mobility (e.g. for education Fischer et al. 2020; Meghir and Palme 2005).

The relationship between state and family changed with the introduction of family and other welfare policies beginning in the 1930s. The relationship between employer and employee became more equal and 'universalistic' welfare policies were introduced (e.g. Magnusson 2000), with the idea that everyone should benefit. Early example of such universalistic family policies are maternity (1938) and child (1948) benefits. Further family policies to alleviate child poverty and ease the combination of work and family for mothers were introduced in the 1950s and 1960s (Stanfors 2007).

In terms of gender equality in the workforce, some early progress was made with the opening of public employment and secondary education for girls and women in the 1920s, and the ban on dismissal due to marriage of women workers in 1939 (Stanfors 2007). These made (non-manual) formal work possible for women. In the 1970s, family policies became gender equal, in contrast to the distinct role assumed of mothers and fathers in earlier policies. Importantly, taxation became individualized in 1971 and parental leave replaced maternity leave in 1974. This was followed by further extensions of parental benefits during the 1980s. After temporal reductions during the 1990s crisis family benefits have largely been at their 1980s levels during the 2000s, except for further efforts to increase gender equality (Stanfors 2007).

The educational system

Public schooling had been introduced early in Sweden in 1842 (Westberg 2019). However, dissipation of full primary educational attainment was slow and completion of primary schooling did not become universal until around 1950, as shown in figure 1; initial roll-out of public schooling was slow, and especially on the countryside two-year 'minor' or parttime schools were more common throughout the nineteenth century than complete primary schooling (cf. Ljungberg and Nilsson 2009).

Few were able to attend secondary or higher education before the 1950s, and such education at the time formed a marker of distinction. 'Educated elites' formed an important high-status group in late nineteenth century Sweden (as signaled by their surname type, see paper two and four). Enrollment in secondary schooling expanded

rapidly for cohorts born after 1935 – especially with the introduction of comprehensive schooling (*grundskola*) in 1962 (e.g. Meghir and Palme 2005). The introduction of *grundskola* marked a major shift in the political purpose of education. In the late nineteenth and early twentieth century, higher education was strongly selective and primarily a pathway for intergenerational transmission of advantage.⁷ Public primary schooling was not aimed at equalizing opportunities for all children, but rather intended to create a sense of national (and religious) identity (e.g. Widerberg 1980).

Despite lack of intent, this early public primary schooling did lead to equalizing opportunities as increasing shares of the population became qualified for occupations with higher skill requirements (as shown in figure 1). Comprehensive schooling (*grundskola*) was introduced with the explicit aim of equalizing opportunities for all children (see e.g. Husén 1989; Paulston 1966). As higher educational expanded, the association between social origin and educational attainment declined in Sweden for cohorts born between the 1920s and 1950s (Jonsson and Erikson 2000). Some of these equalizing opportunities can be linked directly to the introduction of comprehensive schooling (Holmlund 2008; Meghir and Palme 2005). The introduction of comprehensive schooling initiated society-wide increases in higher educational attainment, as shown in figure 1.

⁷ This does not mean that attendance was entirely reserved to children from high status background, some children from other social backgrounds were selected to attend higher education.

Background, theory, and previous research

In this section, I situate my dissertation in the broader scientific literature and wider debates. I cover the previous work on social stratification and, especially, on intergenerational mobility which I consider most relevant to my own work.

Social stratification in the long run

Individuals and groups in a society are organized in one or more, stable or unstable, hierarchies of status. This process is known as social stratification, and in some form or another applies to any society. In pre-industrial or early-industrial societies – such as Sweden until ca. 1900, differences in occupational skill levels are small among the majority population, and ownership of more than a family production unit is concentrated to a small elite. In such a context, social class distinction is mostly present between a small elite and the rest. Such a dichotomous Marxian economic class distinction between bourgeoisie and proletariat was substantial in early industrial Sweden. As described by Max Weber, *economic* class distinctions in early industrial societies were often grounded in Weberian *social* ‘status’ or estate distinctions (Weber 1978a [1922], 1978b [1922]).⁸ High or low social status was strongly heritable and often shaped opportunities for economic attainment, e.g. through higher education, social networks and intermarriage (e.g. Edgren 2021; Fahlbeck 1892).

While ‘class’ is primarily an economic form of distinction, ‘status’ is inherently social (see e.g. Gane 2005). ‘Status’ in Weber (*stände, stand*) is defined with pre-industrial status groupings in mind – although the concept can be applied much more broadly (e.g. to ethnic, racial or gender groups). It refers to social prestige, ascribed group belonging with shared customs, conventions and values and strong social ties. Group belonging is reflected in behavior; status groups tend to strive for intermarriage and interaction within the same group (Weber 1978a [1922]).

In a contemporary context, heritable status distinctions have presumably become less pronounced than in the Weberian context observed in early industrial Sweden and described above, as society moved from attainment through ‘ascription’ to attainment through ‘achievement’. Nevertheless, differences in social origins still translate into distinct labor market trajectories today. Status groups share tastes, experiences, leisure pursuits, and self-presentation styles (‘culture’, cf. Bourdieu 1984), and employers are more likely to hire someone culturally similar to themselves (Rivera 2012). High status origins are today associated with higher wages for the same work, in Sweden as well as elsewhere (Hällsten 2013; Laurison

⁸ Rather than vice versa, as suggested by Marx.

and Friedman 2016).⁹ As society transitioned from ‘ascription’ to ‘achievement’, a stronger link is generally expected historically than today between heritable status differences and labor market outcomes, such as class attainment (cf. modernization theory, Treiman 1970).

So far, the transition from ascription to achievement has often been studied by comparing levels of intergenerational mobility (of class or occupational status) over cohorts. The study of social mobility levels across cohorts does however not tell us whether social stratification along (heritable) status group lines became less consequential for children’s occupational attainment during the same period, or whether the arising industrial social structure still reflected heritable status groups. This is a fundamental open question in our understanding of intergenerational persistence during economic and institutional development – as society presumably moved from ‘ascription’ to ‘achievement’. In this dissertation, I try to answer this question by distinguishing heritable pre-industrial status groups using their distinct surname types, and also occupational status or class positions of parents, and studying how these interact and together are associated with children’s occupational status attainment.

In Sweden, different status groups had distinct political power at least until the abolishment of the Diet system in 1866 and, given the association between economic conditions and status, most likely into the twentieth century (Bengtsson 2019). That the political power of high-status groups other than the nobility and clergy likely increased substantially as economic means rather than estate position became the basis for distributing voting rights after 1866. Not only political stratification, but also other forms of economic stratification was shaped in important ways by pre-industrial status distinctions (e.g. Norrby 2005; Palme 1947). The identification of high-status groups as nobility, clergy, bourgeoisie and other persons of status (*ståndpersoner*), farmers, or as none of these (e.g., the working classes), was of great consequence for inhabitants of Sweden. The higher status groups of nobility, clergy, bourgeoisie, and *ståndpersoner* held much of the political and economic power in the late nineteenth and early twentieth century. These status groups interacted and intermarried primarily with each other rather than with the majority population (see paper four). Moreover, their status group belonging often – but not always – corresponded to a high class position; they were often capitalists or (petty) bourgeoisie in a Marxian sense, owning the means of production and purchasing the labor power of others.

⁹ Note that Laurison and Friedman as well as Hällsten refer to ‘class’ rather than ‘status’. Laurison and Friedman refer to a Bourdieusian class concept, where class and status are seen as strongly interdependent forms of social stratification. When referring to class in this dissertation a narrow economic class concept, following Weber, is intended. For broader social stratification ‘status’ is used, also following Weber.

An ‘ascribed’ trait such as status is more dependent on place of birth than, for example, active participation in a formal labor market. Therefore, pre-industrial social status of both mothers and fathers can be expected to form an important dimension of the intergenerational persistence; the distinct positions of men and women in the economic structure do not apply to this dimension of social stratification if operationalized without the use of occupations. Through intergenerational transmission and status exchange on the marriage market, status inequalities of fathers and mothers may have remained important for the occupational status attainment of later generations (as indicated for elites in e.g. Almenberg and Dreber 2009).

Is social stratification by heritable attributes (such as status groups reflected by surname type) or attained attributes (such as occupation) more consequential in a given context, and how are such attributes defined for different members of a family? Historically, both sexes were born and often married within a status group, with occupational choice largely limited to typical occupations for that prestige group (Tönnies 1966 ; Weber 1978 [1921]). This was the case in Sweden as in many other European societies (e.g. Fahlbeck 1892). When industrialization and gender revolution gave increasing shares of first fathers and then mothers more occupational opportunities (Stanfors and Goldscheider 2017), social stratification by occupation both increased quantitatively and became (formally) independent of pre-industrial social status heritage.

With industrialization, occupational social status positions (occupational status or class) increasingly form a relevant dimension of social stratification also outside of the owner/worker dichotomy. Partly because occupations are perceived as inherently meaningful to individuals and their social environment; it is often one of the first things we ask about when making acquaintance. Other indicators of socioeconomic status such as income and wealth are meaningful only within a context (e.g. currency, state) and through the possibilities associated with them (e.g. consumption, investment). The consequences of class background – on health, wealth and attitudes – are well-documented, especially in the Nordic countries (e.g. Brooks and Svallfors 2010; Esping-Andersen 1990).

Moreover, occupational social status positions are rather fixed over the life course; if class belonging could be changed at will at any time, it would be inconsequential for life outcomes. It is, however, well-known that class positions are tied to earlier life experiences, such as educational attainment, often persisting over the life course (after initial career progression), and partially persisting over generations (e.g. Barone and Schizzerotto 2011; Beller and Hout 2006; Breen 2004; Breen and Müller 2020; Härkönen and Bihagen 2011; Kalleberg and Mouw 2018).

In the dissertation I follow both an occupational status (prestige) approach, a traditional social class approach, with broad classes (conceptually) reflecting Weberian economic distinction, and a ‘microclass’ approach. These three

dimensions of occupational social status are discussed at greater length in the section on measuring social status using occupations. Surname-based social status is discussed in depth in the section on measuring social status using surnames.

Intergenerational persistence in the long run

A long tradition of social mobility research has found important associations between parental social status and child social status, in particular also as represented by occupations (Blau and Duncan 1967; Ganzeboom and Treiman 2003; Hauser and Featherman 1977; Hauser and Warren 1997; Sorokin 1927). The study of social mobility has to a large extent been descriptive. Whether the intergenerational association in social status reflects intergenerationally transmitted economic, cultural or social resources, personal traits such as cognitive ability, or some of each of these or yet something else, remains a matter of debate (see e.g. Morgan, Grusky, and Fields 2006, and later sections on mechanisms).

This dissertation connects to the literature on intergenerational mobility – and especially social mobility – in the long run. I study cohorts before, during, and after industrialization and post-industrialization, and across the emergence and expansion of the Swedish welfare state. The question on how patterns and levels of social mobility have changed under these developments has been one of the key interests in the mobility literature. Early on, it was suggested that all industrialized nations would have similar mobility levels – and likely higher than before industrialization (Lipset and Zetterberg 1959). Later on, a distinction was made between absolute mobility, where differences in the social structure are not controlled for, and relative mobility, where such differences are abstracted from (see more on this in the next section on types of mobility).

Once it was established that absolute mobility differed between industrialized nations, it was suggested that relative mobility was rather similar and stable between industrialized nations (with a market economy, liberal democracy, and a nuclear family system, cf. Featherman, Jones, and Hauser 1975). This hypothesis was long supported by comparative work on social mobility across countries (see e.g. Grusky and Hauser 1984; Hout and DiPrete 2006), also in the seminal book *A Constant Flux* by Robert Erikson and John Goldthorpe (1992). In more recent large-scale comparative studies, relative mobility levels are however deemed to change substantively over time (Breen 2004; Breen and Jonsson 2005; Breen and Müller 2020). A moderate form of the hypothesis has recently been suggested (Bukodi, Paskov, and Nolan 2020). Relative social mobility in these modern societies is suggested to have an upper bound. Societies may either recede from or move closer to this upper bound, depending on economic and institutional differences.¹⁰

¹⁰ The flexible formulation of the “Featherman-Jones-Hauser” hypothesis on stable levels of relative mobility in for example Erikson and Goldthorpe (1992) and recent work makes it close to a

The *Constant Flux* is also one of the first key publications questioning modernization theory on social mobility (Treiman 1970); the idea that social mobility – both relative and absolute – would continuously increase and converge between countries during industrial development (Erikson and Goldthorpe 1992). In recent studies, intergenerational mobility is generally found to be *higher* in the middle of the industrialization process than among later cohorts (as e.g. Berger et al. 2021; Long and Ferrie 2013; Song et al. 2020); differences in the occupation-based social status position of children and parents are large as the occupational structure changes fundamentally – and this is true both when studying relative and absolute mobility. Studies on social mobility going yet further back in economic development however find lower levels of social mobility before industrialization than during or after industrialization (e.g. Dribe, Helgertz, and Van de Putte 2015; Maas and Van Leeuwen 2016; Modalsli 2017). Thus, a long-run increase in social mobility over the course of industrialization is rather well-established, while this increase does not appear to result in similar levels across all societies with a market economy, liberal democracy, and nuclear family system – as initially suggested.

Types of intergenerational persistence

Studies on intergenerational mobility differ in what intergenerational transmission of socioeconomic status each of them studies. Long-term trends in social class mobility (e.g. Maas and Van Leeuwen 2016) may not be the same as trends in intergenerational rank-rank correlations (e.g. Song et al. 2020). The former study associations in a cross-table of discrete social class origins and destinations, controlled for contextual differences. The latter study positions on a hierarchical status scale that has been standardized through a rank-transformation to control for contextual differences. More broadly, studies on intergenerational mobility, intergenerational effects, sibling correlations, and equality of opportunity do not capture the same processes of intergenerational transmission (Björklund and Jäntti 2020; Stuhler 2018). The different approaches differ both conceptually and methodologically. In this dissertation, I follow the currently expanding “equality of opportunity” approach which tries to capture multiple components of social status or compound family background (cf. Björklund and Jäntti 2020; Roemer 1998). I refer to this broader concept of intergenerational transmission as ‘intergenerational persistence’.

In this branch of the literature, previous simpler models of intergenerational mobility have been criticized for not answering the question of how family social

tautology; the hypothesis of constancy is accepted despite it being rejected by their statistical modelling, as differences are deemed non-substantive and the observed commonality more important. This commonality does however not exclude possible institutional effects on social mobility, nor does it make them implausible.

background affects child status attainment – and thereby doesn't reflect overall patterns of persistence and 'equality of opportunity' levels in society. Multiple rather than one generation of ancestors affect child status attainment, either directly or indirectly (e.g. Adermon, Lindahl, and Palme 2021; Hällsten and Kolk 2020; Lindahl et al. 2014; Solon 2018; Song and Mare 2017). Moreover, different indicators of socioeconomic status complement and interact with one another, so that intergenerational transmission of overall (dis)advantage is substantially higher than transmission of one specific aspect of socioeconomic status (e.g. Adermon et al. 2021; Engzell and Tropf 2019; Hällsten 2013; Mood 2017; Vosters 2018; Vosters and Nybom 2017). Higher intergenerational persistence than implied by parent-child associations is also found in the expanding sibling mobility literature; the similarity in outcomes between siblings is generally higher than between a parent and their child, reflecting their broader shared environment (e.g. Björklund and Jäntti 2020; Breen and Jonsson 2005).

The literature on broader intergenerational persistence has often referred to different findings as compared to the intergenerational mobility literature (one indicator of socioeconomic status) as measurement error. However, either approach can be relevant to answer different research questions (e.g. Breen and Jonsson 2005). In my dissertation, I take the multidimensional approach from the 'inequality of opportunity' literature and study how multiple components of parental status affect child status attainment, as I am interested in studying intergenerational persistence of (dis)advantages in a broad sense. To understand my approach and how it relates to other studies of intergenerational mobility it is important to clarify some basic concepts in the mobility literature.¹¹

Levels of *intergenerational* mobility at the individual level refer to disparities in socioeconomic outcomes resulting from the individual's family background. At the one extreme, when mobility is non-existent, such disparities generate complete intergenerational persistence: socioeconomic outcomes of one generation are completely determined by the previous generation – conditional on structural change. At the other extreme, when social mobility is at its maximum, individual outcomes are completely independent of parental outcomes. The chances to obtain a certain social status are the same for a son of a farm worker as for the son of a minister. Such social mobility at the individual level is often referred to as 'relative mobility' or 'social fluidity'.

'Absolute mobility', then, refers to mobility at the aggregate level and does not control for structural change. If the labor force composition of a country shifts towards higher (or lower) skilled occupations, absolute mobility can be high while relative mobility is low. As an example, say that the number of farm workers in a

¹¹ The below concepts are covered in several key books on intergenerational mobility, see e.g. [Erikson and Goldthorpe 1992](#), or for a - shorter - interdisciplinary review article [Torche 2015](#).

country decreases considerably, then many sons of farm workers will have different occupations from their fathers, while the share of farm worker sons among those who are farm workers in the next generation – through which relative mobility is measured – does not need to change. In other words, ‘relative mobility’ abstracts from those parts of intergenerational mobility that are unrelated to the characteristics of the individual and occur because of aggregate changes in the labor market, while ‘absolute mobility’ does not.

From the perspective of the individual, however, ‘absolute mobility’ may be equally relevant. A family experiences whether their children are more ‘successful’ than the parental generation and might not know or care whether this is due to structural change or an individual achievement. On the other hand, relative ‘upward’ mobility may be experienced as more meaningful than absolute ‘upward’ mobility as absolute mobility may affect social stratification; in the first case one son of a farm worker becomes a teacher, in the second case all sons of all farm workers become teachers, and the status of being a teacher may change accordingly. Thus, both ‘absolute’ and ‘relative’ mobility can be important for experienced equality of opportunity and are relevant in different research contexts.

The terms ‘upward mobility’ and ‘downward mobility’ are used when social status is conceptualized hierarchically and then refer to vertical movements up and down the hierarchy of social status. Generally, intergenerational mobility using earnings or income is discussed in hierarchical terms as a one-dimensional hierarchy is inherent in this measurement of status. Social (class) mobility generally has both hierarchical and non-hierarchical components. ‘Vertical mobility’ then refers to either upward or downward mobility and may be considered – depending on the research question – a more substantial form of mobility as its alternative, ‘horizontal mobility’, which refers to movements between social classes that cannot be distinguished hierarchically.

I generally use the term ‘mobility’ to refer to intergenerational mobility. However, individuals also experience changes in earnings or occupation over their life-course. Such changes are often referred to as ‘career mobility’ or ‘intragenerational mobility’. Career mobility is implicitly part of any study of intergenerational mobility, as the researcher has to choose one or more points in the life-course of each generation to designate that generation’s status. Using different stages of the life-course in different generations, often an unwanted consequence of using survey material to study mobility, can lead to substantial bias in the estimation of intergenerational mobility.

Both levels of absolute and relative mobility are affected by changes and socioeconomic differences in demographic behavior; in a conventional ‘retrospective’ mobility approach, children are the ‘focal’ generation which is linked to their parents or other relatives. In a ‘prospective’ approach, the ancestor generation is instead the ‘focal’ generation which is linked to their offspring (Kolk

and Hällsten 2017; Song 2021; Song and Mare 2015). In contrast to the retrospective approach, this prospective approach includes individuals without children, and accounts for differential fertility – both in terms of number of children and generational gaps. Such fertility differences create differences between levels of intergenerational persistence at the societal and individual level.

Social origin, surname, and family types: heterogeneity in intergenerational persistence

Heterogeneity by family type: societal norms, homogamy, and accumulation

Intergenerational transmission of social status (i.e. occupational status, homemaker status, social class) is often seen primarily as a family-level, rather than individual-level, process. That is, family resources in one generation are assumed to be partly transmitted to the next generation. An individual-level approach would instead assume that each parent's resources are transmitted to the next generation independently of one another (e.g. Becker and Tomes 1979; Erikson 1984).¹² A family-level mobility approach is to be preferred over an individual-level approach as parents are likely affecting each other's economic and labor market decisions rather than acting independently of one another (e.g. Dickens and Flynn 2001). In the study of occupational intergenerational mobility, a patriarchal perspective on social origin, where the family social status is represented by the occupation of the head of household, has long prevailed. It was criticized early on (Acker 1973, 1980; Rosenfeld 1978; Sorensen 1994) and continues to be so more recently (Beller 2009; Hout 2018; Korupp, Ganzeboom, and Van Der Lippe 2002; Thaning and Hällsten 2020).

The “dominance approach” in the social mobility literature was developed by Robert Erikson (1984) as a solution to recognized issues with the previous exclusion of mothers from social mobility studies (e.g. Watson and Barth 1964). The family would continue to form the unit of analysis in social mobility research, but their social status would be defined as the occupational class of the parent with highest status. In practice the dominant parent was mostly the father in mid-twentieth century households, but this role was increasingly often taken by the mother in more recent cohorts (e.g. Korupp et al. 2002; Meraviglia and Ganzeboom 2008). This “dominance” approach is still commonly used in studies of social mobility today, despite repeated critique (Beller 2009; Korupp, Ganzeboom, et al. 2002; Sorensen 1994; Thaning and Hällsten 2020).

There are obvious methodological benefits to using one parent rather than two, such as parsimonious modelling and no collinearity due to assortative mating (e.g.

¹² In single parent households the individual-level and family level approach are equivalent and therefore the following discussion focusses on two parent households.

Sorensen 1994). Theoretically, pooling of resources within the household may be used as an argument to use only one parental measure reflecting both parents, such as total family income (Becker and Tomes 1979, 1986). Whereas the “dominant” approach treats families as a patriarchal (or matriarchal) unit, the “pooled” approach treats a family as the simple sum of its parts. It is evident that not both can reflect family social origin well, as underlying assumptions are clearly distinct. Max Thaning and Martin Hällsten (2020) show that the “pooled” approach (averaging of occupational status) performs better empirically also when it comes to occupational social status in recent Swedish cohorts. They demonstrate that the ‘dominance’ approach to social origin is still dominant in the sociological literature, despite performing worse than several other alternatives. A measure including the social origin of both parents, as well as an interaction between parents, is best able to explain sibling correlations in social status. Their findings are based on child status attainment not separated by gender, i.e. sons and daughters are not studied separately (Thaning and Hällsten 2020). It therefore remains an open question whether these findings apply in the same way to sons and daughters. I partly apply the pooled approach suggested by Thaning and Hällsten in paper four; there I use either the occupational status of the father – if the mother is not working, or the average of both parents’ occupational status – if both parents are working. The “pooled” approach that treats parental resources as cumulative is an improvement upon the “dominance” approach in a number of contexts, but also has its limits.

It was not until a study by Emily Beller (2009) that the impact of mothers was brought back on the agenda of mainstream social stratification research. Beller shows that in a contemporary US context, both mothers and fathers impact child status attainment and found no interaction effects between the two parents – an additive model of mobility including fathers and mothers separately performed just as well as a multiplicative model (Beller 2009). Beller also finds that intergenerational mobility patterns differ for sons and daughters. She finds an increasing impact of mothers over time. As a result, intergenerational mobility has been overestimated for recent cohorts in studies using the dominance approach (Beller 2009).

Defining social origin as the sum of fathers’ and mothers’ social (occupational) statuses – an additive model – assumes that parents affect child status attainment independently of each other and that distinct transmission pathways, such as cultural or economic resource transmission, are cumulative (e.g. Beller 2009). It disregards the possibility that the impact of one parent with given social status differs depending on the social status of the other parent. Importantly, such interactions between parents change over time with changes in the institution of the family and changing gender norms. For example, in a breadwinner-homemaker context, specialization in the household may be positive for child outcomes (cf. Becker 1985), while it may be negative in a dual-earner context.

Parental resources may interact through *compensation*, where additional resources from the second parent are more beneficial for those with *fewer* resources from the first parent (Bernardi 2012; Erola and Kilpi-Jakonen 2017; Grätz and Wiborg 2020). In contrast, parental resources may interact through *multiplication*, where additional resources from the second parent are more beneficial for those with *more* resources from the first parent (Blau and Duncan 1967; DiPrete and Eirich 2006; Grätz and Wiborg 2020). For a more thorough discussion of compensation and multiplication, see paper three. In the context of social mobility, some evidence has been found for such multiplicative effects of both parents (see online appendix, Thaning and Hällsten 2020).

Moreover, status homogamy also affects the extent to which parents transmit social status to their children (Schwartz 2013). That is, a given cumulative social status of two parents may either reflect one parent with relatively high, and one parent with relatively low social status – or two parents with intermediate social status. Parents resembling each other (status homogamy) are expected to be more beneficial for child status attainment than parents who differ from each other (status heterogamy). If levels of homogamy affect child status attainment, then we can interpret this as a specific case of multiplicative accumulation. This can either be the result of multiplicative processes as described above, or the result of threshold effects where having two parents above a given threshold is more beneficial than having one parent with particularly high social status (Schwartz 2013).

Status homogamy has historically been especially profound among high status groups who have resources to transmit intergenerationally. In nineteenth century Sweden, homogamy in social origin was indeed stronger among high status (land holding) groups (Dribe and Lundh 2005). Also more recently, (wealth) homogamy is especially profound among high status groups (e.g. in the Nordic countries; Wagner, Boertien, and Gørtz 2020). The level of homogamy is important to answer the question to what extent family-level social origin affects child status attainment, as it describes resemblance between parents in terms of social status. That is, family social origin is a function of both assortative mating and occupational attainment of each parent. Erikson and Goldthorpe (1992, p. 261) maintain that information on the class distribution of men of a given class origin is sufficient to predict “with no great inaccuracy” their sisters’ class distribution through marriage in all countries and cohorts studied. That is, status homogamy is deemed nearly complete and gender differences in intergenerational mobility and status homogamy negligible (Sorensen 1994).

However, homogamy, although substantial, is far from complete both historically and today (Dribe and Lundh 2005; Henz and Jonsson 2003). Homogamy also differs substantially by gender. In our Swedish context, fathers are married to mothers with lower levels of educational attainment (“male hypogamy”), while mothers are married to fathers with higher levels of educational attainment (“female hypergamy”). This pattern of male hypogamy and female hypergamy is persistent

for all cohorts of parents included in this dissertation, but did become less profound over time (see Henz and Jonsson 2003).¹³ The impact of children's status homogamy on intergenerational mobility has been studied empirically in the American and European context and is found to vary over time and space (Choi, Chung, and Breen 2020; Ermisch, Francesconi, and Siedler 2006; Holmlund 2022). Differences in parents' status homogamy and their impact on social mobility levels has not been the focus of previous research – although it has been recognized as relevant (e.g. Beller 2009; Mood 2017; Thaning and Hällsten 2020).

Intergenerational mobility of mothers' occupational status has barely been studied for historical settings. But in the context of the nineteenth century Netherlands, mothers' occupational and homemaker status are found to be relevant (Kong, Maas, and van Leeuwen 2020). Having a homemaker mother was positively associated with child status attainment, especially for sons. In this historical context, substantial gender differences in intergenerational mobility are found, with the father-son association being strongest. Over time, father-daughter mobility is found to have increased (Kong et al. 2020). Differences in intergenerational mobility by family type have been addressed mostly for the US context. Breadwinners are found to impact child status attainment more than men in dual-earner couples (Fischer and Hout 2006), while the role of homemakers seems to vary based on other factors (Beller 2009; Brea-Martinez 2022). Previous research has not yet addressed long-term patterns and trends in two-parent mobility as society transitioned from the agricultural production unit, to the male breadwinner, to the dual-earner family type. A large literature shows that gender differences in intergenerational mobility exist among children and change over time (with changes in family type, gender norms and structural development, see e.g. Olivetti and Paserman 2015; Torche 2015).

In a recent study, the family type transition from male breadwinner to dual-earner is shown to have reduced mother-child income mobility and thereby parent-child income mobility, despite father-child income mobility remaining constant for 1951-1979 birth cohorts in Sweden, Denmark and Norway. Thus, an observed overall reduction in income mobility over this period in Scandinavia does not necessarily reflect reductions in the transmission of 'underlying' socioeconomic status, but rather an increase in the extent to which family income reflects both fathers' and mothers' broader socioeconomic status. A similar trend – although less pronounced – is observed also in the US (Ahrsjö, Karadakic, and Rasmussen 2021). Given distinct patterns of occupational and income mobility in the Scandinavian countries (Breen and Jonsson 2005; Breen et al. 2016; Karlson 2021), it is interesting to study this transition also using occupational status. All the more so as the transition from male breadwinner to dual-earner society likely impacted the occupational status of

¹³ More recent Swedish cohorts experience female hypogamy, but these do not form parental cohorts in our study. See e.g. Chudnovskaya and Kashyap 2020.

families more strongly than household income, e.g. if breadwinner fathers, on average, work more hours than dual-earner fathers.

Based on these theoretical and methodological considerations and previous empirical studies, I expect the impact of mothers and of parents on child status attainment to strongly depend upon the contemporary context of family and work. Processes of accumulation and multiplication in intergenerational transmission are likely relevant but also strongly dependent upon the societal family type context. In societies where families as production units dominate, the occupational status of both parents is perfectly correlated and necessarily well represented by the head of household. In societies where a substantial share of parents form male breadwinner family units, the major distinction will be between specialized and non-specialized households. In such societies, the social position of homemakers relative to mothers in formal employment, or relative to those in production units, will matter for intergenerational persistence. In these societies the occupation of the head of household represents the occupational social status of both mothers and fathers, while other dimensions of mother's independent social status are probably important for child occupational status attainment.

Unlike in production units, the parents in male breadwinner families perform clearly distinct tasks in distinct spheres – therefore the social status in these family types is probably more two-dimensional than in family production units. For example, the homemaker status of a mother per se may increase the propensity for her children to become homemakers themselves or engage in similar formal work such as childcare services, irrespective of the father's occupational status. Moreover, the strength of the father-child status association may depend on their partners occupational or homemaker status ('breadwinner effect', as also found in Fischer and Hout 2006; Hout 2018). The influence of homemaker mothers on child status attainment may depend both on the social status of her partner (which due to assortative mating partly reflects the mothers' social origin), and on prevailing gender and family norms. A previous study on social mobility using both parents suggest just this, that the category of homemaker mothers is highly diverse and therefore their impact on child status attainment varies (Beller 2009).

The influence of a working mother's occupational status on their children's occupational status attainment may similarly depend upon prevailing gender and family norms. Her labor market attachment and thereby the extent to which a mother's broader socioeconomic status is reflected by her occupational status differs between these contexts. These dependencies are the reason that I study intergenerational persistence and the role of both parents therein with a focus on societal family norms as well as actual family constellations in paper three. In this paper, I do find important differences in patterns of intergenerational persistence between different family types and by societal family norms.

Heterogeneity by gender

According to gender-role model theory, same-gender parents could play a larger role than opposite-gender parents in intergenerational mobility of social status (e.g. Rosenfeld 1978). Children identify with the same-gender parent and – either through socialization or unconscious imitation – behave similarly to the same-gender parent (Boyd 1989; Kong et al. 2020). Such gender differences in intergenerational mobility have indeed been found in some contexts (for the US, Beller 2009).

The applicability of gender-role model theory is linked to contextual factors. In societies with both male breadwinner and dual-earner families, working mothers provide a role model function for their daughters. There is a clear mother-daughter association in labor force participation, so that more working mothers raise more working daughters (Siegel and Curtis 1963; Stevens and Boyd 1980), working outside of female-dominated occupations (Rosenfeld 1978). Gender attitudes and corresponding family types may also be transmitted intergenerationally (e.g. Luke 2021).

Whether children choose gender-segregated occupations is associated with their parent's propensity to choose such occupations. But gender segregation in the labor force in itself could also lead to more mobility among opposite-gender parent-child pairs; parent and child of the same gender are more likely to end up in occupations dominated by their gender (Eriksson 2015; Korupp, Sanders, and Ganzeboom 2002). Both gender-role models and gender segregation in the labor force could thus be associated with gender differences in intergenerational mobility, where the same-gender parent is more important in explaining child status attainment.

Both gender segregation of the labor market and gender segregation in the family were stronger and more formalized in historical contexts than in Sweden today (e.g. Janssens 2014; Widerberg 1980), and therefore gender differences in intergenerational mobility could be more pronounced historically. Changes over time in the extent to which roles in the family and labor force are gendered suggest that the inclusion of gender is particularly important when studying intergenerational mobility over a long period of time. Gender differences in intergenerational mobility could be more pronounced under the male breadwinner and production unit family types than in dual-earner families (Beller 2009; Kong et al. 2020).

Heterogeneity by occupational social origin

I study intergenerational mobility of mothers and fathers by social origin to see whether parents matter at different points in the social structure and to explore processes of accumulation of parental resources. There is a broad literature on wealth and income mobility and their differing rates of intergenerational persistence at different points of the distribution. A number of previous studies, both on Sweden

and other countries, have found intergenerational persistence of socioeconomic status to be higher at the high end of the social structure (Adermon et al. 2021; Björklund, Roine, and Waldenström 2012; Bratsberg et al. 2007; Hällsten and Pfeffer 2017; Munk, Bonke, and Hussain 2016; Reeves et al. 2017). Especially intergenerational transmission of wealth is particularly strong among the wealthy (Pfeffer and Killewald 2018). Top income persistence is high and similar across countries with very different welfare regimes; the variation in overall mobility levels derives from differences in income persistence at the lower end of the income distribution (Esping-Andersen 2015).

Previous research has shown that wealth, income, occupational status and other indicators of socioeconomic status complement each other in terms of overall intergenerational persistence (Hällsten and Thaning 2021). Social climbers often experience worse economic outcomes even within high-status positions (Hällsten 2013; Hansen and Toft 2021; Laurison and Friedman 2016). Both this complementarity of different dimensions of socioeconomic status, and the economic differences within social classes at the top, suggest that some of the high economic persistence at the top is not associated with high occupational status persistence.

It is not entirely clear from previous research whether occupational status would also be transmitted more strongly at the high end of the social structure, and there are both methodological and theoretical reasons for this uncertainty. Differences by social origin in father's and mother's relative time investment in their career and family – where lower-status families follow more traditional patterns and higher-status families more gender-equal patterns (Bonke and Esping-Andersen 2011) – could result in differences in the relative importance of fathers and mothers at different social origins. If parental time investment creates high persistence, mothers in low status families could be more important than fathers – while both parents would be similar in high status families. If more parental time invested in children means a weaker labor market attachment and this in turn would make occupational status of a parent less persistent over generations, then mothers in low status families could be less important than fathers – while both parents would still be similar in high status families.

In practice, detailed differentiation on an occupational status scale is often lacking among high-status occupations (see also Blanden 2013). Elite intergenerational persistence will therefore often not be captured by social mobility measures. Theoretically, high income and wealth persistence at the top can be related to processes not reflected by occupational attainment, such as inheritance or geographical income inequalities. Social networks (e.g. dynastic social capital), manners and habits, and other forms of distinction could play a role in a high level of high-status persistence economically as well as socially (e.g. Almenberg and Dreber 2009; Reeves et al. 2017). Other possible explanations of high income and wealth persistence, relating to credentialism and ability more broadly, can also result in high social as well as economic immobility.

Thus, I cautiously expected to find lower intergenerational mobility of occupational status at the higher end of the social structure, but less so than for income and wealth mobility; in paper three this is generally what I find when it comes to fathers, but not mothers. Both among late nineteenth century cohorts, and among the most recent cohorts born in the 1970s and 1980s, I find that mother-child associations in occupational status are *higher* at lower social origins, while father-child associations are higher at high social origins. These differences might be linked to gender differences in parental time investment by social origin (cf. Bonke and Esping-Andersen 2011).

High persistence at the top in the Scandinavian countries has received particular attention, as these countries are generally seen as egalitarian. Gøsta Esping-Andersen evaluates the relationship between welfare regimes and intergenerational persistence (Esping-Andersen 2015; Esping-Andersen and Wagner 2012). He finds – also beyond the economic realm – that equalization in Scandinavia has been a ‘bottom-up’ process; welfare policies have benefited children from disadvantaged backgrounds and substantially reduced their disadvantages, as compared to other countries’ policies. At the same time, the opportunity structure of higher-status groups appears rather unaffected by welfare policies.

Esping-Andersen suggests three possible explanations for this imbalance (Esping-Andersen 2015). He deems the first two – political constraints and compensatory strategies – to be unlikely in the Scandinavian context, but suggests that intergenerational persistence at the top is unaffected by policy because its mechanisms cannot be equalized through policy, and that this policy-resistant form of intergenerational persistence has become increasingly important over time. Examples of such policy-resistant mechanisms behind high persistence at the top are increasing socioeconomic differences in parental investment (of time and resources), increasing status homogamy, and regressive pension systems (Esping-Andersen 2015).

Such high, and apparently policy resistant, intergenerational persistence at the top could explain high surname status persistence as I find in paper two and paper four, as social status reflected by surnames mainly distinguishes traditionally high-status groups from the rest of the population – they make little distinction among the broad majority.

Heterogeneity by surname type

One of several recent approaches to study intergenerational mobility over long time periods or across varying contexts has been the use of surnames and surname groups to proxy family lineages (e.g. Clark 2014; Güell, Rodríguez Mora, and Telmer 2015). Gregory Clark and collaborators depart from the idea that conventional intergenerational mobility studies suffer from bias due to measurement error. At the surname (group) level, random variation in any one indicator of socioeconomic

status would be lower than at the individual level because more than one individual is observed in the same surname (group). Therefore, they suggest that parent-child associations in “underlying” socioeconomic status can be approximated better at this level than at the parent-child level (cf. Bukowski et al. 2021; Clark 2014; Clark et al. 2015; Clark, Leigh, and Pottenger 2020; Clark and Cummins 2014, 2015). This idea rests upon a large number of stringent assumptions on the nature of intergenerational mobility patterns and social stratification, which are unlikely to apply in real world situations (e.g. Maas 2015; Torche and Corvalan 2018).

An alternative benefit to using surnames is that they allow studies of intergenerational mobility using only cross-sectional data sources that would otherwise be too limited for mobility research. In this case, surnames are used not because they form a better measure than parent-child associations, but because they form a measure on equal footing that can be applied more easily to a wider range of contexts (Barone and Mocetti 2021; Güell, Pellizzari, et al. 2018; Güell, Rodríguez Mora, and Telmer 2007; Güell et al. 2015; Santavirta and Stuhler 2021). The methodology of this latter approach is also applied to study intergenerational persistence using first names (Olivetti and Paserman 2015; Olivetti, Paserman, and Salisbury 2018; Santavirta and Stuhler 2021), and in other evaluations of the surname approach (Chetty et al. 2014; Feigenbaum 2018).

Both approaches find high intergenerational persistence of socioeconomic status. Higher than implied by the intergenerational mobility literature, if intergenerational mobility would be a simple parent-child transmission process (“AR(1)”, cf. Becker and Tomes 1986). Thereby they confirm the broader recent literature on intergenerational persistence (e.g. also using multidimensional status indicators, three or more generations, or siblings) in finding higher intergenerational persistence when conceptualizing socioeconomic status more broadly than the earlier intergenerational mobility literature did. However, both approaches lean heavily on the ‘informational content’ of lineages contained in rare, often high-status, surnames (Santavirta and Stuhler 2021). Thus, resulting estimates of intergenerational persistence may reflect high-status groups in society more than other social strata (see also e.g. Maas 2015). Indeed, intergenerational persistence as measured using surnames appears to be somewhat higher among higher-status groups, both at the surname and surname group level (see paper two, and Barone and Mocetti 2021; Santavirta and Stuhler 2021).

In this dissertation I apply a group-level surname approach. In paper two, we find that much of the informational content of individual surnames in Sweden is contained in a small number of surname groups distinguished by their distinct pre-industrial social status. In this introduction to the dissertation, I discuss the Swedish social status groups as based on surname types in the section on ‘measuring social status using surnames’. This means I depart in substantive ways from the existing surname mobility literature. While they use surnames as a proxy for family lineages, I see surname group as a proxy for pre-industrial – non-occupational – social status

groups. Paper two covers this distinction between surname groups as social strata, and surnames as proxies for families, extensively. With an empirical evaluation, we show in this paper that most of the ‘informational content’ of surnames reflects these pre-industrial social strata rather than individual family lineages, as the informational content of different surnames *within* pre-industrial social strata is rather low.

This distinction is important, especially in the context of a major critique to the surname mobility literature. When using surnames, intergenerational mobility is estimated using grouped data. This means that intergenerational mobility at the surname group level only reflects the between-group component of parent-child intergenerational mobility (Torche and Corvalan 2018). Within surname groups, intergenerational mobility may be either high or low. Depending on this, high surname-level intergenerational persistence has different implications for an individual’s chances to move up or down the social ladder as compared to their parents. In paper four, I disentangle surname status persistence – the between-group mobility also covered by paper two – from intergenerational mobility of occupational status. I estimate parent-child associations in occupational status attainment within surname groups and across the full population, and describe how patterns and changes over time in intergenerational mobility differ by pre-industrial social origin (as defined by surname type).

We find very high surname status persistence in Sweden in paper two, across all social strata distinguished by surname type. However, the two large surname groups contain 25-65% of the Swedish population. For such large groups, intergenerational mobility *within* surname groups is of great importance for child status attainment, as members of these surname groups are distributed across all social strata to a much larger extent than the members of small high-status surname groups. In paper four, I show that historically high surname-level intergenerational persistence and high parent-child persistence among high-status groups goes hand in hand with substantial intergenerational mobility within the large group with lower status (patronymic) surnames.

Combining the study of individual-level and group-level processes of intergenerational persistence has been suggested as a new and valuable direction of mobility research (Güell, Rodríguez Mora, and Solon 2018). A similar approach has been applied in the context of geographical or neighborhood differences in intergenerational mobility (Chetty et al. 2014; Chetty and Hendren 2018a, 2018b; Connor and Storper 2020), and racial or ethnic differences in intergenerational mobility (Chetty et al. 2020; Davis and Mazumder 2018; Torche and Corvalan 2018). However, this dissertation is the first to disentangle intergenerational mobility along the lines of pre-industrial social strata and show how high within-group mobility for the majority population goes hand in hand with strong patterns of persistence among high-status groups.

Mechanisms behind intergenerational mobility

Clearly contextual factors and the way in which one accounts for them matters for our understanding of intergenerational mobility, both at a large and small scale. Mobility levels differ when comparing individuals to either one or both parents, of differing or same gender. Mobility levels differ by the extent to which parents resemble each other's social status (through homogamy). They differ as the institutions of family and work transform, for men as well as for women. Mobility levels differ by social origin. They differ by surname status and gender. Mobility levels differ during and as a result of structural transformations of the economy. Once one accounts for these important differences, other mechanisms behind different levels of intergenerational mobility at the family level remain.

One major contributor to both intergenerational mobility and intergenerational persistence is education. Publicly financed universal education, together with other institutions for equal opportunities, give broader parts of the social structure access to qualifications necessary for high status occupational attainment (e.g. Breen and Müller 2020). The impact of such institutions for equal opportunities on intergenerational mobility is discussed in the next section, while I shortly cover previous research on parental investment (of time or money) and biological and other personal characteristics in this section. These important mechanisms are discussed only briefly here, as they are not directly studied in the dissertation.

Parental investment

At the family level, a key contributor to the intergenerational transmission of social status from parents to children is parental investment, of time as well as other resources (e.g. Heckman 2006; Schneider, Hastings, and LaBriola 2018). Different forms of parental investment have been linked to children's educational attainment, also in the Nordic context (Thomsen 2015). The size of the association between parental investment and attainment is substantial, especially in early life. In the US, parenting style and home learning environment have been found to explain more of income-related gaps in kindergarten test scores than maternal education does (Waldfogel and Washbrook 2011).

Parental investment of both time and economic resources has increased in recent decades, especially parental investment in early life before equalizing institutions such as schools come into play (e.g. Bianchi, Robinson, and Milke 2006; Kornrich and Furstenberg 2013). As parental investment has increased during the past half century, it presumably becomes an increasingly important contributor to intergenerational persistence over time. Especially because social inequalities in parental investment have increased during recent decades (McLanahan 2004; Schneider et al. 2018). Inequalities in parental time investment are not only high in economically more unequal settings such as the US, but also in a recent Nordic context (Bonke and Esping-Andersen 2011).

In the American context, mothers' education is generally seen as more consequential than fathers' for the effect of parental time investment on children's educational attainment, as mothers tend to spend more time on childrearing activities. When tested in a Nordic context, this assumption is violated; both mothers and fathers with higher levels of educational attainment invest more time in their children – especially if both parents are highly educated (Bonke and Esping-Andersen 2011). Homogamy plays an important role in parental time investment in the Nordics as its effect differs by educational level. Lower-educated homogamous parents spend less time on caring, and time spent is more gendered with mothers doing most of the childrearing. In contrast, highly-educated homogamous couples both spend more time on childrearing, in an egalitarian rather than specialized way (Bonke and Esping-Andersen 2011).

In terms of intergenerational mobility, these patterns may be reflected in higher intergenerational persistence – both from fathers and mothers – among (homogamous) high-status parents in the dual-earner family type. Specialization among low-status parents along traditional gender lines may be reflected in lower status associations between mothers' occupational status and their children's occupational attainment, as the labor market attachment of these mothers is weaker. On the other hand, if time investment is a key mediator in parent-child associations, mother-child associations could be higher in low-status families as mothers spend more time with children in such families – especially also in terms of mother's non-occupational social status.

Personal characteristics

It is not always clear what content of parental time investment results in intergenerational transmission between parents and children. When it comes to intergenerational persistence in an exact occupational category, parents can be role models to their children (Jonsson et al. 2009). When it comes to intergenerational persistence of a certain class belonging, but not the exact same occupation, time investment is often linked to the transmission of a broad array of characteristics – including characteristics which are generally not seen as 'meritocratic' in defining occupational attainment, such as personality or social skills (Jackson 2007).

Certain personality traits and social skills can increase one's chances to be employed in specific occupations or social classes, while being less valuable for attainment in other occupations or classes. Parental social networks may also play an important role in giving access to certain occupational positions but not others (e.g. Pöyliö, Erola, and Kilpi-Jakonen 2018). It is likely that information asymmetries exist between high- and low-status families in terms of employment processes, career paths, and career attractiveness. Importantly, career aspirations are to an extent shaped by one's parents and broader social environment. Thus, perceived desirability as well as accessibility of high-status positions likely differs between high- and low-status families (e.g. Bernardi and Ballarino 2016).

On the other side of the employment process, the employer may value characteristics in a potential employee that are related to social origin – such as certain social skills. In particular, employers generally prefer to employ candidates with characteristics similar to themselves (e.g. Rivera 2012).

In the following section, on the impact of institutions for equal opportunities, I discuss inheritance – a form of parental investment – and its relationship to intergenerational persistence.

Inheritance of traits

Studies on intergenerational ‘direct’ effects often want to abstract from any contextual components of intergenerational persistence and study to what extent the social status of parents and children resembles each other net of any parental investment or contextual or group-level differences. A focus on such ‘direct’ effects is motivated by the presumed inevitability of ‘direct’ intergenerational effects; these should not be dependent on policy context and therefore intergenerationally transmitted inequalities of this kind are inevitable as long as inequalities in outcomes exist (e.g. Björklund and Jäntti 2020; Stuhler 2018). To distinguish direct and indirect intergenerational effects, specific subsamples have been studied where presumably indirect factors are not at play or can be controlled for, such as adoptees and monozygotic twins.

Using monozygotic twins, the effect of a mother’s schooling on children’s educational attainment *net* of the mother’s inert abilities is studied in the US context (Behrman and Rosenzweig 2002, 2005); with the latter reflecting the part of the mother’s intergenerational persistence that exists regardless of circumstances. Once inert ability and the father’s schooling and earning are controlled for, these studies find no direct effect of a mother’s schooling on children’s educational attainment – or rather a negative effect. In contrast, a positive direct effect of the father’s schooling on children’s schooling is found (Behrman and Rosenzweig 2002, 2005). A study using adoptees rather than twins comes to a similar conclusion; rearing mothers, but not biological mothers, affect their children’s educational attainment – suggesting that time investment is more important than inert ability in the case of mothers (Plug 2004).

Results such as these – which reflect a broader literature in which mothers are seen as primarily affecting intergenerational persistence in their role as homemakers, while fathers primarily in their role as breadwinners – could be highly context-dependent, as indicated by results in paper three in this dissertation. Contextual differences in these results are made plausible by similar studies in a Swedish context, using Swedish adoptees (Björklund, Lindahl, and Plug 2006; Grönqvist, Öckert, and Vlachos 2017). In these studies, both adoptive and biological parents are found to affect children’s educational attainment, earnings, cognitive and non-cognitive abilities. Adoptive parents appear to be more important for outcomes in

later childhood as outcomes in early childhood (Björklund et al. 2006; cf. Kalmijn 1994). Both cognitive and non-cognitive abilities are persistent over generations – and more so than income, but appear to be transmitted along separate lines (Grönqvist et al. 2017). In contrast to the earlier literature based on the US, in Sweden direct intergenerational effects from adoptive mothers to their children are stronger than from adoptive fathers (Grönqvist et al. 2017).

Overall, these studies on twins and adoptees, which try to disentangle biological and childrearing pathways in intergenerational mobility, confirm a picture of multidimensionality and context-dependency of patterns of intergenerational persistence. In contrast to expectations, causal genetic intergenerational effects do not seem to generalize across contexts – suggesting that contextual factors mediate the importance of biological factors differently across contexts, and consequently that there is no fixed level of (genetic) intergenerational persistence that exists regardless of context. These contrasting findings on intergenerational effects taken together highlight the relevance of studying intergenerational persistence descriptively, with attention to context, and as a society-wide phenomenon, as I do in this dissertation.

The impact of institutions for equal opportunities

The educational system

The expansion of public schooling is often seen as the most important policy reform in the transition from an ‘ascription’ to an ‘achievement’ society; as education becomes available universally, those with highest ability, rather than those with parents in the right positions, can attain more prestigious occupational positions. Occupational sorting becomes based on educational qualifications rather than quality markers more dependent on family background. The actual effect of the expansion of schooling on intergenerational mobility and equality of opportunity is, however, difficult to quantify; school expansion often occurs nation-wide and overlapped with the development of other institutions for equal opportunities. Moreover, school expansion at different levels may affect opportunities differently. In Denmark, educational mobility increased with the expansion of secondary schooling, but decreased with further educational expansion at the tertiary level (Karlson and Landersø 2021).

In Sweden, the effect of the introduction of comprehensive primary and secondary schooling on intergenerational mobility has been quantified, exploiting the gradual implementation of the reform during the 1950s and 1960s (Holmlund 2008; Meghir and Palme 2005). The introduction of comprehensive schooling (*grundskola*) meant both an increase in compulsory schooling duration to nine years (from seven or eight), the abolition of educational tracking at early ages, and the introduction of a nationally unified curriculum. The effect of this reform on earnings of the full

population was either marginally positive (Meghir and Palme 2005), or non-existent (Holmlund 2008). However, both studies find the reform to have increased equality of opportunity as children with lower social origins benefited while the incomes of children with well-off parents were reduced by the reform.

Those with lower-educated fathers were positively affected by the reform, both in terms of educational attainment and earnings. Earnings increased most for children with lower-educated fathers who themselves had high cognitive ability, but also increased among those with lower ability. However, for children to fathers with more than compulsory schooling (less than one in five fathers), earnings decreased substantially after the reform (Meghir and Palme 2005). Holmlund finds a 12% increase in income mobility caused by the educational reform (Holmlund 2008). These studies thus strongly suggest that opportunities in Sweden depended more on ability, and less on family background, after the introduction of comprehensive schooling.

This much-studied compulsory school reform has been compared to a more specific earlier Swedish reform which did not affect tracking but only extended educational duration by increasing term length (Fischer et al. 2020). In contrast to the later reform, this earlier reform resulted in higher earnings across the social structure, increasing overall economic growth rather than equality of opportunity. Compared to this term extension, the negative effects of the compulsory school reform during the 1950s on earnings of individuals from well-off families (either highly educated or with high lifetime incomes) suggest that the tracking system existing in Sweden before the compulsory school reform particularly benefited individuals with high-status family backgrounds.¹⁴ Negative effects of tracking on equality of opportunity are also found outside of Sweden across a variety of national contexts (Brunello and Checchi 2007).

Education plays a role in intergenerational mobility in three ways. *Equalization* takes place when the effect of class origins on educational attainment declines. Mobility can also increase as a result of *expansion*; if labor markets are more meritocratic at higher levels of educational attainment (i.e. less dependent on class origin), then increasing shares of each cohort attain higher levels of educational attainment. This increases mobility without changes in the effect of class origin at a given level of educational attainment. Finally, reductions in the association between educational attainment and social destination would also lead to higher mobility. In Sweden, both equalization and expansion played an important role among 1906-1972 birth cohorts (Breen and Jonsson 2007, 2020).

¹⁴ There was a marginal negative effect on years of schooling among these groups as well, but this is unlikely to explain the more sizeable negative effect on earnings given existing estimates of the returns to schooling.

Equalization was mostly important among cohorts born during the first half of the twentieth century; among these cohorts, the association between parental class and educational attainment was substantially reduced as primary schooling expanded. Educational expansion, both at the secondary and tertiary level, drove reductions in social mobility among cohorts born 1945-1964 – cohorts affected by the previously discussed compulsory school reform (Breen and Jonsson 2007, 2020). Among cohorts born after 1964, social mobility no longer increases. Studying the role of the expansion of tertiary education on social mobility has so far been difficult in the Swedish case, as cohorts experiencing tertiary but not secondary expansion are born from the 1960s. The survey material often used to study social mobility ends in 1972, so that few cohorts experiencing tertiary expansion are observed (but see on Denmark, Karlson and Landersø 2021).¹⁵

Studies on other countries show that the equalization process observed in Sweden occurred also elsewhere; in countries such as France, Germany, Italy and the Netherlands a weakening of the relationship between social origin and educational attainment during the twentieth century was associated with increased social mobility (Breen and Müller 2020).

Overall, the introduction of comprehensive schooling during the 1950s and 1960s thus increased social mobility for affected cohorts, and descriptive studies suggest increases in social mobility due to school expansion even for earlier twentieth century Swedish cohorts. The preconditions underlying processes of equalization and expansion are however context-dependent, and it is not a given that further educational expansion also increased social mobility. In more recent contexts, parental compensation has been raised as a pathway reducing ‘direct’ social mobility, controlled for educational attainment; parents compensate for the weakening relationship between social origin and educational attainment in order to ensure that their children’s social status resembles theirs – regardless of their educational attainment (Bernardi and Ballarino 2016).

Reductions in social mobility as (tertiary) education expands can also occur regardless of conscious parental compensation strategies. This may be the case if other family background characteristics than educational attainment become more valuable on labor markets as a result of reduced variability in attainment (e.g. Bernardi and Ballarino 2016; Karlson and Landersø 2021). Educational reforms, especially tertiary expansion, and increases in compulsory years of schooling, have been found to increase such parental compensation in twenty-five European countries, including Sweden (Pöyliö et al. 2018). The observed increase in the ‘net’ association between social origins and destinations is in fact large enough to

¹⁵ Among 1975-1985 Swedish birth cohorts and reaching occupational maturity by 2021, one in three has a university degree and over half have attended some tertiary education. Among 1955-65 Swedish birth cohorts, this was still substantially lower with 20% having a university degree and less than 40% some tertiary education (Statistics Sweden 2022).

compensate for any reductions in the association between social origin and educational attainment, resulting in constant levels of social mobility over European cohorts born ca. 1940-1975 (Pöyliö et al. 2018).

The overall effect of educational systems on social mobility is difficult to study, as changes in educational systems often happen simultaneously with other contextual changes, and internationally comparable educational systems are associated with different mobility regimes. Several studies have captured the association between education and mobility by comparing educational systems and levels of inequality of opportunity among European countries (Pöyliö and Kallio 2017; Schlicht, Stadelmann-Steffen, and Freitag 2010). The comprehensive account by Schlicht and collaborators found a number of policy effects differing substantially between former Communist and Western democracies (including Sweden). Higher educational expenditure, high preschool attendance, and long hours per school year, are associated with smaller parental background effects on educational attainment in Western democracies. Sweden has among the lowest number of hours per school year, but high educational expenditure and high preschool attendance (Schlicht et al. 2010). When only the possibility of preschool attendance was evaluated, no association with mobility was found (Pöyliö and Kallio 2017).

Contrary to expectations, tracking, a high share of private schools, and large class size increased educational mobility (Schlicht et al. 2010). In the data used for this study, Sweden had no tracking, a low share of private schools, and small class sizes – all associated with low educational mobility. Although most aspects of the Swedish educational system studied here point towards strong associations between parental social origin and educational attainment, educational mobility is actually found to be relatively high in Sweden (Schlicht et al. 2010).

This study would thus suggest that relatively high educational mobility in Sweden today exists despite, rather than because of, the Swedish educational system. However, an increase in school leaving age and higher proportions completing tertiary education – both observed in Sweden – are found to be associated with increases in social mobility. Both in a European comparative perspective (Pöyliö and Kallio 2017), and specifically at the moment of implementation in Sweden (Holmlund 2008; Meghir and Palme 2005).¹⁶

Early life conditions have been shown to affect later life socioeconomic outcomes in important ways (Heckman 2006). Much of the debate on education and intergenerational mobility, however, focuses on educational expansion and therefore on secondary and tertiary education, undergone at teenage or adolescent

¹⁶ Whether increased mobility with the introduction of *grundskola* is due to increases in school leaving age or to the abolishment of tracking cannot be addressed by the referenced studies, although other research points towards the latter (Brunello and Checchi 2007; Fischer et al. 2020).

ages. Whether an educational system equalizes opportunities or not might depend largely on the quality and scope of high-quality, pre-school institutions (as suggested by Esping-Andersen 2015; but see Pöyliö and Kallio 2017).

Before the 1960s, daycare attendance in Sweden was not widespread and daycares were mostly used by poor families, such as those with single mothers (Elwert and Quaranta 2022). They may thus have played a role in enhancing upward mobility chances for those at the very bottom of the social structure. Although today's Swedish pre-schools are both universal and high-quality, their further expansion occurred rather late – during the 1970s through the 1990s. Moreover, early expansion of publicly financed pre-schools during the 1970s was far greater among children from middle class families than among children with a lower-class background (Nyberg 2012). Potential equalizing effects of Swedish pre-schools among broader groups of the population would thus not be observable for cohorts born prior to 1980, and would be outside of the scope of my dissertation – or most other existing studies on social mobility in Sweden.

The welfare state

Although education is seen as the key component in the relationship between social origin and destination, other aspects of the welfare state have also been suggested to relate to social stratification and mobility. Overall, social mobility levels do not differ much between countries with different welfare regimes, and do not always differ in expected ways (Breen and Müller 2020; Erikson and Goldthorpe 1992). This makes the question of how institutions influence intergenerational mobility a difficult one to answer. Social democratic welfare regimes, such as the Swedish, are suggested to reduce inequality of opportunity relative to other regimes (e.g. Beller and Hout 2006; Sørensen 2006; Tranby 2006). Under these regimes, social policies reducing inequality of opportunity are expected to increase intergenerational mobility in terms of income, as well as education and occupation (Sørensen 2006).¹⁷

As other welfare policies increase mobility in social democratic welfare regimes, the role of educational systems is suggested to be more limited here than in liberal welfare regimes (cf. Beller and Hout 2006). Not only education, but also other policies and institutions may matter less for intergenerational mobility in a low economic inequality context (cf. Hertel and Groh-Samberg 2019). The Swedish welfare regime transitioned to become more liberal and less economically equal since the 1990s and thus the role of education in reducing inequality of opportunity in Sweden may have increased over time. Moreover, in recent decades returns to education have increased, which could lead to decreasing income mobility (cf. Harding and Munk 2020).

¹⁷ This link between low income inequality and high mobility may be limited to income mobility, see discussion on the “mobility paradox” of the Nordic countries elsewhere (see e.g. Breen, Mood, and Jonsson 2016; Karlson 2021).

It has been suggested that the equalizing effect of educational expansion as well as other welfare institutions does not affect all parts of the social structure equally. Equalization of opportunities in the Nordic countries has been a bottom-up process, where the impact of disadvantaged social origins is substantially reduced, while advantages connected to a high-status origin remain constant (Esping-Andersen 2015; Esping-Andersen and Wagner 2012). Specifically, generous *universal* welfare provisions may decrease the disadvantages associated with a lower class background, while leaving higher social origins unaffected.

Equalization as a bottom-up process has functioned well to reduce social inequalities in the Nordic countries during much of the twentieth century. More recently it may facilitate the quick integration of immigrant groups. As previous lower-status groups, immigrants in Sweden generally experience more intergenerational mobility than natives (OECD 2018). On the downside, the lack of mobility at the higher end of the social structure, in combination with high and increasing wealth inequality, may increasingly reduce access to high-status positions for those from other social origins (see e.g. Adermon et al. 2021; Hansen and Toft 2021).

Family policies, which generally redistribute income from the general population to families with (young) children, have also been linked to intergenerational mobility of social status. A comparative European study suggests that increased expenditure on family services – financing policies facilitating the combination of family and work – is associated with increased upward educational mobility for those from lower status origins (Crettaz and Jacot 2014). In particular, the expansion of pre-schools may alleviate the adverse effects of a childhood in poverty (Esping-Andersen 2015).

Gender equalization policies, and the early increase in labor force participation among mothers, reduced poverty risks at the bottom of the Swedish income distribution. The increase of women's labor force participation across the social structure is associated in time with reductions in the relationship between social origin and educational attainment. Thus, gender equalization and family policies may indirectly be at the heart of high social mobility in the Nordic countries (Esping-Andersen 2015 - high when studied using the 'dominance' approach to social origin).

The important role of family policies is partially confirmed for policies not related to gender equalization. Maternity leave policies are shown to form a perfect example of institutional compensation; longer paid maternity leave is associated with higher occupational attainment among children from low-status origins, while it does not affect the occupational status of children from high-status origins either positively

or negatively (Pöyliö and Kallio 2017).¹⁸ With regards to maternity leave, the idea of institutional reductions of intergenerational persistence as a bottom-up process is thus confirmed.

The progressive redistribution of economic resources is a key characteristic of the welfare state. Together with levels of economic inequality, more broadly, it has been linked to social mobility. The literature on the relationship between inequality and mobility is described in the following section.

The distribution of income and wealth

Current levels of economic inequality, and how they have changed over time, are important in the study of intergenerational persistence, especially because of a recently widely confirmed pattern termed ‘the Great Gatsby Curve’ (Corak 2013) – countries with lower levels of economic inequality generally display higher levels of income mobility. Similarly, in a cross-country comparison, lower levels of economic inequality between social classes appear to be associated with higher levels of social mobility (Hertel and Groh-Samberg 2019).

Although the ‘Great Gatsby Curve’ is widely established in cross-country or regional comparisons, its generalizability to changes over time appears limited (DiPrete 2020; Durlauf, Kourtellos, and Tan 2022); generally, there is no clear association between reductions in economic inequality and subsequent reductions in relative intergenerational mobility – as studied in most of this dissertation. Absolute mobility, which does not control for structural changes in the economy or social structure, is more consistently related to economic inequality also over time (DiPrete 2020).

The ‘Great Gatsby Curve’ – and its social mobility equivalent – relate income or earnings inequality to intergenerational persistence. A rapidly expanding literature also links wealth to social stratification and mobility, as a complementary dimension to income or earnings (Hansen and Toft 2021; Killewald, Pfeffer, and Schachner 2017; Pfeffer 2018; Pfeffer and Killewald 2018). Especially in Sweden, wealth appears to be associated with intergenerational persistence in important ways not accounted for by studying income mobility (Hällsten and Pfeffer 2017; Hällsten and Thaning 2021).

The relationship between wealth inequality and intergenerational persistence is in some ways more direct than that between income inequality and persistence, as wealth refers to capital stocks rather than flows – which are more persistent over time. Inherited wealth results in intergenerational persistence of socioeconomic status in a very direct way, and in Sweden as in many other developed economies

¹⁸ The same study does however not find significant associations between pre-primary education or family allowances and social mobility, possibly due to limited identification strategies rather than the lack of an association.

about half of all private wealth is inherited (Ohlsson, Roine, and Waldenström 2020). In Sweden, inheritances play an important role in explaining intergenerational persistence of wealth, explaining up to half of such persistence (Adermon, Lindahl, and Waldenström 2018). While wealth inequality is discussed as a possible explanation for the ‘Great Gatsby Curve’ in terms of income – especially through its role in distributing political power (Durlauf et al. 2022), most of the comparative literature on the link between economic inequality and mobility has not focused on wealth as its measure of economic inequality (DiPrete 2020).

Through inheritance, wealth inequality present in one generation is partially transmitted to the next generation – also when taking differential fertility into consideration. Inheritance taxation can be seen as an institution for equal opportunities, as it limits the direct intergenerational transfer of wealth. Welfare states differ in the extent to which they limit intergenerational transmission of wealth through differing tax regimes. Among the wealthiest, wealth is transmitted intergenerationally and not depleted by each generation – as rates of return on inherited wealth are high among this group. However, inherited wealth among other groups of the population is generally depleted within one generation and therefore less consequential for mobility levels (Nekoei and Seim 2018). Inheritance tax rates, and tax evasion, among the wealthiest are therefore consequential for levels of intergenerational mobility – but perhaps inheritance or other wealth taxes are less important in determining mobility levels among the rest of the population.

In the dissertation I make use of several pre-industrial high-status surname groups. As the wealthy, these groups form an elite – at least in terms of their occupational status – in Sweden. I do not quantify the extent to which these two dimensions of elite status interact, but it is likely that wealth and high surname status overlap to a considerable extent – especially over the long term. Thus, particular patterns of intergenerational persistence which apply to the wealthy could also be at play for high-status surname groups.

Data and methods

Census and register data across time

Throughout the dissertation I use administrative data in the form of historical and contemporary full-count censuses and official registers. The included historical censuses (1880, 1890, 1900, 1910, 1950) cover the full population living in Sweden at the time (4.6-7 million individuals). Statistics Sweden (*Statistiska centralbyrån*) started compiling population statistics from 1858. Swedish censuses from 1860 are based on excerpts from church books kept by local priests. Priests sent excerpts of parish registers (*husförhörslängden*), and birth-, marriage- and death registers to Statistics Sweden who centrally compiled full population censuses based on the former, and population statistics based on the latter (Statistics Sweden 1969).

Resident registration was fundamentally reorganized in 1946, importantly with the introduction of personal identifiers in 1947. Consequently, censuses compiled by Statistics Sweden in 1950 and 1960 are no longer based on local priest excerpts, but instead on tax registers (*mantalslängder*). These tax registers were however still based on excerpts from church registers (see e.g. Statistics Sweden 1969). From 1968, automation of population statistics resulted in the creation of continuous registers; whereas local population statistics were sent in at fixed intervals previously, this now happened on a continuous basis.

The historical census material is of relatively high quality internationally as the demographic, geographic, and socioeconomic information contained in it was recorded by local priests rather than reported by a population with – initially – little education among the majority. The 1880-1910 censuses have been digitized by the Swedish National Archives in the SweCens project (The Swedish National Archives, Umeå University, and the Minnesota Population Center, 2011a, 2011b, 2014; The Swedish National Archives and the Minnesota Population Center, 2016).

Within the Swedpop project (www.swedpop.se), occupational information has been harmonized across the 1880, 1890, 1900, 1910 and 1950 censuses. Other information from the 1950 census used in this dissertation, such as surnames, is from an earlier digitized version of the census (Arkiv Digital 2015). Importantly, the 1950 census includes numeric personal identifiers.¹⁹

¹⁹ The 1950 census misses some important information (e.g., complete personal identifiers) for specific groups (children born in central Stockholm in the years directly prior to 1950). This is likely related to the process of assigning unique personal identifiers taking some time to coordinate in early years, especially in densely populated areas (also indicated by duplicates elsewhere). However, this does not limit my work as I use the census material for two purposes not affected by these limitations. Firstly, I link individuals living in Sweden both in 1910 and 1950 – who are adults in 1950 and were assigned personal identifiers upon introduction in 1947.

Since 2001 Statistics Sweden maintains an annual occupational register. I use data from this register, in combination with other relevant registers, to define occupational status among recent cohorts.²⁰

The 1970-1990 censuses contain self-reported information on the occupations of individuals. Occupations in the occupational registers are reported by employers and reflect current employment. For the purpose of studying social stratification and mobility, the self-reported information, with high coverage, is preferable over the information contained in the occupational registers. These registers miss occupational information on individuals in project employment, larger non-salaried employers, and most small employers (with 0-2 employees). This means that both some high status occupations such as consultants or investors, but also low-status occupations such as small shop-owners and other self-employed (e.g. construction workers, cleaners) are not included. Coverage in the occupational registers is better for the public than private sector and consequently better for women than men (Statistics Sweden 2011).

Why census and register data?

Each of the papers in the dissertation describes long-term patterns in social stratification or mobility. To do so, data sources covering a long time period have been combined and, to the extent possible, aligned. Throughout the dissertation, descriptive statistical methods are used. The dissertation aims to describe changes over time across the Swedish population with high external validity. Therefore, it makes use of data sources covering the full population rather than survey material. Such data sources are generally more limited in the depth of individual-level information which is available than, for example, targeted surveys. This means that the research questions that can be answered using such sources in one way are more limited; administrative and census data generally does not include any subjective information (on for example attitudes, beliefs). However, in another way the range of questions that can be answered using longitudinal full-population data is much wider than when using a sample.

This type of data lends itself well to study small subpopulations or rare outcomes, such as elite surname groups, for which smaller samples do not have the statistical power. It also lends itself well to study broad changes over time across society, as I do in this dissertation (cf. Stuhler 2018). In particular, the dissertation emphasizes several dimensions of heterogeneity in social stratification and mobility. Such heterogeneity can limit the representativeness of studies based on (smaller) samples.

Secondly, I observe surnames and occupational information for adults in 1950 and link this to subsequent generations using continuous registers.

²⁰ Modern register and census data used in the dissertation are part of the Swedish Interdisciplinary Panel (SIP), a compilation of different official register and censuses starting in 1960 (hosted at the Centre for Economic Demography, PI: Jonas Helgertz), or part of

Compared to other sources, full-population administrative data is also less vulnerable to attrition; generally, all those who stay in the country can be followed over time, especially since the introduction of personal identifiers (in Sweden in 1947).

In previous studies, results on patterns of intergenerational persistence have varied or been inconclusive (for a short interdisciplinary literature review, see e.g. Stuhler 2018). Trends in intergenerational mobility have often been studied over a relatively short observation period, or over few birth cohorts. In economic history and historical sociology, some studies on long-term trends in intergenerational mobility have been conducted, also with contradictory conclusions (e.g. Dribe et al. 2015; Long and Ferrie 2013; Maas and Van Leeuwen 2016; Song et al. 2020). These studies differ in methodology as well as sample size, and descriptive studies such as those on intergenerational mobility trends are particularly sensitive to such differences (see e.g. Engzell and Mood 2021; Stuhler 2018). These inconsistencies in the existing literature illustrate the importance of a thorough and consistent research design in answering questions on changes over time in social stratification and mobility – which I hope to provide in this dissertation by using standardized occupational information from full-count censuses and registers.

Linking individuals and families across time

In order to study intergenerational persistence records of individuals need to be linked across time as well as to their parents and children. Such a longitudinal data structure is necessary to observe both parents and children in their prime working ages. The 1880-1950 censuses include information at the individual and household level. This structure with household and individual layers makes it possible to link children to their parents reliably, and observe their family relationship. Individuals in these historical censuses are linked between census years and to a register of all deaths (*Sveriges dödsbok*) by Björn Eriksson using probabilistic name linking methods (as elaborated in Dribe, Eriksson, and Scalone 2019; Eriksson 2015).

For data compiled after 1950, I use personal identifiers to link individuals to themselves across time. As the register of deaths (*Sveriges dödsbok*) also includes personal identifiers and is linked to the historical 1880-1910 censuses, I also use personal identifiers to create a link between the data from 1950 onwards and the historical data. This creates longitudinal data on individuals, but to also be able to link individuals across generations to their family members, I use the multigenerational register (*flergenerationsregistret*) from Statistics Sweden. This register covers most parent-child links for children born from 1932 onwards, with some limitations for early cohorts.²¹ To follow families over time, I link censuses from 1950 (1950-1990) and occupational registers (2001-2016) to each other using

²¹ Coverage is rather low for birth years before 1935, I therefore use the multigenerational register for children born from 1935 onwards.

personal identifiers. Intergenerational links and current presence in Sweden are retrieved from the multigenerational register and register of the total population (RTB) from Statistics Sweden.²²

Research design and statistical methodology

To make best use of this unique data source, the research design and statistical methodology must fit the data across time. Each of the studies uses data sources compiled from 1880 until 2016 and covering Swedish birth cohorts from 1810 until 1985. Changes in data sources make the use of data spanning such a long period challenging, and much time in this dissertation project has been spent on data management and designing a study population of parent-child cohorts that are, to the greatest extent possible, followed across time. The alignment of occupational coding considerations around the measurement of dimensions of social status (see subsequent subsections) have received particular attention.

Throughout the dissertation, descriptive statistical methods are used. These methods are best suited to describe long-term developments in social stratification and intergenerational mobility. Knowing, descriptively, how these processes develop over the long term is a prerequisite for asking relevant questions about underlying mechanisms. This could seem straightforward, but requires careful consideration of applicability of definitions and methods in different contexts – and differences between these result in substantively different results (e.g. Engzell and Mood 2021).

In sociology and social history relative social mobility, or ‘social fluidity’, the association between parental class origin (O) and child class destination (D), has long been studied using log-linear models (Breen 2004; Breen and Müller 2020; Erikson and Goldthorpe 1992; Grusky and Fukumoto 1989; Hauser 1978; Hout 1983). In such models, the (log) odds ratios of mobility tables (OD crosstables) are compared over time or contexts using a hypothesized mobility structure. The best model to explain a mobility table is chosen by comparing goodness-of-fit statistics (such as BIC) between specifications. This approach generates rather complex outcome parameters and relies on specific assumptions on the pattern of change. Specifically, it assumes that class boundaries are fundamental in intergenerational mobility while status differences within social classes are assumed to be inconsequential. This assumption is questionable given the literature on microclass mobility showing that big class immobility to an extent reflects occupational immobility (e.g. Griffiths et al. 2019; Jonsson et al. 2009), as well as the literature evaluating class boundaries and comparing class to occupational status where

²² The modern register and census data used here are part of the Swedish Interdisciplinary Panel (SIP), a compilation of different official register and censuses starting in 1960 (hosted at the Centre for Economic Demography, PI: Jonas Helgertz).

theoretical expectations do not align with empirical findings (e.g. Bihagen and Halleröd 2000; Bihagen and Lambert 2018).

In this dissertation, I therefore operationalize child status attainment using a continuous occupational scale. Parental social origin is also primarily operationalized using occupational status, although I often perform sensitivity analyses using social class instead.²³ Occupational status is rank transformed in order to make occupational status positions more comparable across time; the rank transformation controls for structural transformations of the occupational structure. However, as the variation in underlying occupations differs quite substantially over time, the rank transformation alone is not sufficient to make parental and child status distributions fully comparable across cohorts; the variation in the rank transformed occupational status indicator differs across time. I control for this by standardization of the occupational status rank.

After careful consideration of variable definitions and controls, most analyses are performed using OLS regressions, or linear probability models in the case of binary outcomes. In the study of surname status persistence, I make use of the proportion of explained variance (R^2) statistic, which has a generally bad reputation because of its limited usefulness in goodness-of-fit testing. Its use has been revived in the surname mobility literature (Güell et al. 2015) and I extend this approach by applying it to group-level intergenerational persistence. In most papers, relatively complex interaction hypotheses are tested, and to make the results of these tests interpretable, expected outcomes are visualized at different values of explanatory variables.

Measuring dimensions of social status across time

Measuring social status using occupations

Occupational information is recorded in string format in the 1880-1950 census data. These occupational strings are recoded into HISCO (Leeuwen, Maas, and Miles 2002) in a standardized way within the SwedPop project (www.swedpop.se). In the dissertation, I create HISCO codes for modern occupational source data as available in the 1960-90 censuses. This makes the occupational coding used in the dissertation substantially more consistent over time as was possible with existing coding schemes (see paper one). From this standardized occupational information, I derive information on social stratification in the form of social class as well as occupational status (or prestige). In this section, I describe some of the important considerations and decisions related to that process.

²³ Social class is assumed to be a more specific indicator of labor market status than my operationalization of occupational status, which reflects social status more broadly.

The link between social status and occupations at young ages is less stable than at ‘mature’ ages, both historically and today.²⁴ Historically, occupations at younger ages may be on-the-job training or a way to save capital for a future career. These phases are incorporated in the educational and welfare system in later cohorts. For example, farmers and farmers’ wives often started their career as agricultural or domestic servants (e.g. Lundh, 2004). In more recent decades, establishment in the labor force happens at increasingly older ages and this differs by educational attainment (e.g. Gottfries, 2018). It is increasingly common for occupations held by individuals in their twenties to be precarious (side jobs, temporary jobs) and not reflect eventual occupational status of individuals (e.g. Savage et al., 2013).

Thus, an important aim in the dissertation has been to observe individuals’ occupations at ‘mature’ ages. In paper one on social stratification, I reflect on the importance of age for the social structure by studying different age groups. In paper two, only men aged 30-60 are included. In paper three and four, which use longitudinal data, I have tried to abstract from changing career trajectories by observing as complete career trajectories as possible, and have subsequently used the highest attained occupational status or class position over the life course – after the age of 25 – to define social status. This abstraction from differing career trajectories is especially relevant in a study on intergenerational persistence which includes both men and women. Occupational status of women is relatively lower in childbearing ages, and career trajectories change over cohorts (Härkönen, Manzoni, and Bihagen 2016).

In previous research occupational status is generally defined using either occupational prestige rankings from surveys (e.g. Treiman’s prestige scale, Treiman 1977), indices reflecting other socioeconomic status attributes associated with an occupation (education and income, e.g. ISEI, Ganzeboom, De Graaf, and Treiman 1992), or social distances between occupations (e.g. CAMSIS, Prandy and Lambert 2003).²⁵ The first and last definitions are most in line with a Weberian definition of social status. Weber explicitly defines assortative mating and social interaction amongst themselves as a defining characteristic of status groups (Weber 1978b [1922], 1978a [1922]).

As it is not possible to conduct a survey to generate a subjective prestige ranking historically, the alternative of a social distance based occupational status measure is most suitable to define social status in historical contexts. A standard historical status scale, in the spirit of CAMSIS, has been created based on HISCO

²⁴ The age range for occupational maturity, or career completion, is not necessarily constant over time. The Swedish workforce appears to reach occupational maturity at increasing ages over cohorts born during the twentieth century (Bihagen, Shahbazian, and Kjellsson 2022).

²⁵ For an excellent discussion of contemporary as well as occupational status measures – with the emphasis on social network based measures as used in this dissertation – see especially chapter 3 in Lambert and Griffiths (2018).

occupational coding (as used here). This HISCAM status scale is derived using marriage certificates covering seven countries, including Sweden, and the period of 1800-1938 (Lambert et al. 2013). The scale captures social distances by using social networks as reflected by marriage certificates.

Social class has long been the most widely used measure of social stratification in the literature on social mobility (Breen 2004; Breen and Müller 2020; Erikson and Goldthorpe 1992). Theoretically as well as empirically, the concepts of occupational status and social class differ in substantive ways. Social class, following a Weberian tradition, directly reflects economic conditions and labor relations – rather than social networks and prestige (Weber 1978b [1922], 1978a [1922]). There is a temporal difference between the two concepts as well; status is inherently more persistent than class, as it reflects a collective value placed on one's social position (social esteem), while class reflects an individual's actual (current) economic situation. Class is a categorization, which divides members of a society over a limited number of social groups. Between these groups, clear boundaries should exist, while groups are relatively homogenous amongst themselves (see e.g. Crompton 2008).

In paper one of this dissertation, I compare the Swedish social structure as defined by social class to that defined by occupational prestige. I find that over the course of economic and institutional development – and as human capital among the workforce increases – the occupational social structure appears to become more 'gradational' and less 'discrete' in nature. While both dimensions of social stratification have their distinct inherent value, I mainly use occupational status in the study of intergenerational persistence. Occupational status lends itself well to study heterogeneity along non-occupational dimensions of social status.

I operationalize social class using an internationally standardized historical class scheme based on HISCO occupational coding, and called HISCLASS (Van Leeuwen and Maas 2011). The HISCLASS scheme has some particular advantages over contemporary class schemes for application in a study of long-term patterns and trends. It is feasible to use in a contemporary as well as a historical context, as it specifies a sufficient number of class boundaries between large social groups today which were often small in pre-industrial contexts; it contains five non-manual classes (Van Leeuwen and Maas 2011).

Empirical studies in the Swedish context generally find dependence relationships (employer/employee) to be rather inconsequential for social inequality (Le Grand and Tåhlin 2013; Tåhlin 2007). From a long-term perspective the inclusion of dependence relationships as a distinctive feature of a class scheme is problematic, as positions with high authority and autonomy commonly held by employers until the early twentieth century became managerial employee positions since the later twentieth century. This shift towards managerial positions is abstracted from in the

HISCLASS scheme by classing together all supervisory positions (either owners or managers).

Differences in skill requirements between jobs create important distinctions in terms of wage and prestige (Le Grand and Tählin 2013; Tählin 2007). Therefore, another advantage of the HISCLASS scheme is its distinction of four different skill levels, which are related to the duration of required training for different jobs. In our study, educational attainment of the workforce changes substantially. Arguably, occupations that historically had the same skill requirements can still be grouped as one social class with similar social status in modern times – although the actual number of years or days of training of those occupying these classes will have generally increased substantially. Moreover, HISCLASS separates the farmers and farm workers from other social classes. This is also useful when a class scheme is applied to a context first dominated by and later virtually without a primary sector.

Beside ‘big’ social classes and an occupational status scale, I also use microclasses in the dissertation. Microclasses are defined as (groups of) occupations which are seen as reflecting ‘classes’ in their own right – reflecting occupational networks and specific shared expertise which create a sense of class belonging and shared class interests (Weeden and Grusky 2005). Intergenerational mobility has been shown to follow microclass lines to a significant extent (Griffiths et al. 2019; Jonsson et al. 2009), but the question of whether microclasses should be interpreted as ‘class’ in a Weberian sense – reflecting economic distinction – remains debated. Microclasses could rather reflect non-economic factors, such as social networks (as suggested by the empirical evaluation in Brooks and Svallfors 2010). Regardless of the importance of the economic dimension in each, microclasses, big social classes, and occupational status each reflect social status in different ways.

Measuring social status using surnames

As the general social structure of the Swedish workforce changed, its link to historical institutions also faded. Aristocratic distinction was important in pre-industrial nineteenth century Sweden and is reflected in Swedish surname practices. Although only Clark (2012) has so far used some of these distinctions to study social stratification and intergenerational mobility in Sweden, these prestige differences between surname groups have been noted repeatedly by linguists (Brylla 2005, 2009, 2011, 2014; Frändén 2010, 2014, 2017; Hedberg 2019; Nyström et al. 2021; Utterström 1985, 1994).

Surnames contain information on the social status origins of individuals. They are generally inherited over generations and are often informative on prestige of ancestors at the time of adoption. Traditional Swedish surnames appear to be particularly informative on ancestral prestige, as they are explicitly rooted in the pre-industrial system of social stratification (Nyström et al. 2021). Most Swedish surnames used in the period of 1880-1950 fall into distinct groups reflecting their

prestige in the historical system of social stratification (in Swedish: *stånd*, cf. *Stände* in German, see e.g. Carlsson 1949, 1966; Fahlbeck 1892; Weber 1978 [1921]). Pre-industrial social stratification of surname groups thus reflect “*stånd*” heritage, or Weberian “social status”. Status groups did not necessarily reflect economic distinction but are primarily associated with cultural and social capital. Although such social stratification in the long run also leads to economic distinction among those with high status, status is not dependent on economic resources and is more persistent than for example wealth (Weber 1978 [1921]).

The social stratification reflected by surname groups is for example reflected in concrete power differences as the nobility, clergy, bourgeoisie and farmers each had their own political representatives in the Swedish Diet of Four Estates (*ståndsriksdagen*) from the mid-fifteenth century until 1866 (e.g. Carlsson 1949).²⁶ In pre-industrial Sweden, patronyms referring to the name of one’s father were used among all social classes. This did not change for most of the population until the eighteenth and nineteenth century, although in coastal cities and the north the use of other fixed surnames began already in the late seventeenth century. Adoption of fixed surnames was particularly uncommon before 1900 in the formerly Danish regions in the south of Sweden, which is still evident from the prevalence of patronymic surnames in the south today (Nyström et al. 2021).²⁷ Surname adoption became widespread in aristocratic circles in the seventeenth century, and thereafter spread to other social groups. The emergence of fixed surnames in Sweden was relatively late in a European context. In for example Italy, surnames were commonly used as early as the fifteenth century (see e.g. Barone and Mocetti 2021). Patronyms and names with geographical and occupational reference are common throughout Europe (Debus, Heuser, and Nübling 2014; Heuser, Nübling, and Schmuck 2011).

²⁶ Not all of the Swedish population was represented by these estates, as the ‘farmer’ estate was exclusively open for landholding farmers (and iron producers - *bergsmän*). Thus, a substantial share of the Swedish population was estateless.

²⁷ Legally, families were almost fully free to choose and change their surnames until 1901, when the process was formalized. Before 1901, only the use of noble surnames was formally restricted. However, as family names or surnames were adopted with the purpose to signal family belonging, in practice surname change was likely not that frequent. Quantitative accounts on this are lacking. Changing surname was and is often associated with important life-course transitions such as migration, marriage, childbirth and graduation (Brylla 2005, 2011, 2014; Nyström et al. 2021; Utterström 1994). In certain contexts, the lack of legislation on fixed surnames led to high rates of surname change; supposedly only about 10% of prison inmates bearing noble surnames belonged to the nobility (Leibring 2012). This was addressed and having a surname became compulsory in 1915. During much of the twentieth century the possibility to change surname was limited legally. Following new legislation in 1982 and 2016 adopting new names has again become comparatively easy in Sweden. Since the 1990s adopting surnames that signal high social status, such as those resembling nobility names, has become increasingly popular (Brylla 2005; Leibring 2012). Surname change by ethnic minorities has been used as an assimilation strategy historically as well as today (Frändén 2010, 2020).

The adoption of patronyms as surnames was also common among the broad majority of farmers and (non-)farm workers in Sweden.

The first status group with distinct surnames distinguished consists of surnames adopted by the nobility. These are identified as surnames listed by *Riddarhuset* as ‘titled’ (higher) and ‘untitled’ (lower) noble lineages, and their usage was formally restricted to paternal descendants of the title holder from 1626 until the 1980s.²⁸ In pre-industrial Sweden noble lineages would be expected to hold high-status occupations, either as a land-owning elite, in the military or within the state apparatus – being strongly overrepresented in the legislative, executive and judiciary power (e.g. Carlsson 1949).

The second surname group distinguished here consists of ‘educated’ names initially reserved for the ‘clergy’ of the Church of Sweden. Over time, this group broadened and its names became associated with a broader ‘educated’ status group; those with higher educational degrees were seen as *ståndspersoner* by their nineteenth century contemporaries (e.g. Fahlbeck 1892). In the analysis, ‘educated’ names are separated into three distinct subgroups: Latinized (-us) and Greek (-ander) names were commonly adopted during the sixteenth and seventeenth century. Subsequently French-sounding names (e.g. -ell, -ér, -én) became more fashionable and the adoption of such French-sounding names was still common among the educated in the late nineteenth century. Between 1880 and 1950, new bearers entered the group of French-sounding names, while there is little change in the size of the Latinized and Greek-sounding surname groups.²⁹ This ‘educated’ status group, together with the nobility, formed a pre-industrial aristocracy in Sweden; education was relatively expensive and mostly reserved for children of the existing higher classes (see context section).

The third group of geographic ‘bourgeois’ surnames includes names originally primarily adopted by the (petty) bourgeoisie (artisans, merchants, and similar). These names generally consist of two geographic elements referring to natural locations such as hills, trees, rivers or plants (e.g. Lindberg), but may also contain

²⁸ A selection of names from the *Riddarhuset* list with rapidly increasing number of bearers, or high number of bearers throughout, are excluded. Examples of excluded names are common foreign names reserved for a noble lineage in Sweden; migrants were not required to change their ‘noble’ name upon entry to Sweden. Although many noble surnames have a distinct connotation due to heraldic elements, I define the surname group based on noble heritage rather than name connotation; many noble-sounding names never had noble bearers and many noble names do not have a noble-sounding, heraldic, connotation. In the historical sample I can separate titled nobility (*friherrlig*, *grevlig* and *kommendör*) from untitled nobility (*adlig*).

²⁹ Surname adaptation was largely unregulated in Sweden up until 1901, when surnames became fixed. It was not until a sequence of legislative changes in 1919, 1920, 1921 and 1922 that adoption of existing surnames became restricted. Only noble surnames were somewhat protected under earlier legislation from 1626/1707 (see further Linde 2003). Even during the 1920s-1950s, adoption of new ‘designated’ surnames was common (see e.g. Hedberg 2019 and his ongoing work).

heraldic elements or geographical references to the area in which a family lives or used to live. Patronyms (e.g. Eriksson) form a fourth group. During medieval times, virtually all Swedes bore proper patronymic names (father's first name plus son or daughter). These names were abandoned by higher status groups, while they remained in use and became fixed among the broad majority of farmers and (non-) farm workers. In the twentieth century the adoption of fixed family names had become the norm (and was also encouraged in name laws from 1901). The number of families bearing patronyms gradually declined over the course of the 1880-2016 period, both as these families more often than other groups changed surnames and emigrated to North America.³⁰

I observe 1950 ancestor surnames rather than individual surnames for the 1960-2016 population.³¹ This means that I only observe intergenerational transmission of ancestral surname status and not effects of surname connotation. By assigning surname groups through intergenerational links rather than observed names, I avoid any biases in surname status persistence caused by changing of surnames by more mobile individuals for the years 1950-2015.

Remaining surnames not classified belong to two groups; those names which appear in the historical 1880-1950 census data not classified as Roman, nobility, bourgeoisie, or patronymic names are diverse and consist of among others 'soldier', other geographical, German-sounding, French-sounding and other foreign (e.g. Polish, Finnish) or minority (e.g. Sami) names.³² However, besides such minorities,

³⁰ Between 1880 and 1910, in each decade 4-7% of the Swedish population emigrated to the Americas (gross emigration rate by end of decade population). Between 1910 and 1930, decadal rates of emigration were still over 2%. Transatlantic migration was likely more common among low-skilled and unskilled rural workers, who often bore patronymic names (e.g. Ljungberg 1997). Until 1930, immigration to Sweden consists largely of return migrants from the Americas. It was only during the Second World War that other forms of immigration become non-negligible. Generally, low immigration results in all Swedish surname groups until 1950 mostly being composed of Swedish-born individuals, including the 'rest' category.

³¹ Individuals are assigned to the same surname group as their paternal grandfather, father, or themselves depending on which is the latest generation observed in 1950. Those born after 1950 with no registered father are assumed to belong to the same surname group as their mothers if they have a maternal ancestor in Sweden in 1950.

³² In earlier versions of this paper, another surname group with soldier names was distinguished (e.g. Tapper, Dolk). In the eighteenth and nineteenth centuries, all soldiers received names upon entering an army division. These names were retained by many soldiers and became common as fixed surnames (e.g. Wahlberg 1990a, 1990b). At the same time, it was common for such names to be transmitted between subsequent soldiers inhabiting the same soldier farm – without biological relations. Many soldier names were similar to the group of geographical surnames. However, a subset of such names can be distinguished as these refer to military objects or (un)desirable personality traits in a military context. This group – as patronymic surnames – has low social status historically, but unlike patronymic surnames, soldier names had relatively low numbers of bearers per name. However, as these names can be either family names or location names, I have chosen to exclude them. In line with the literature, also the high share occupied as

this 'rest' category primarily consist of newer and more unconventional high status names adopted during industrialization. I also group together all those since 1960 for whom I do not observe an ancestral surname in 1950. This group expands over time and consists predominantly of immigrant names.

soldiers among men bearing soldier names in the nineteenth century, suggests that these names in many cases were attached to a location ('soldattorp') rather than a family.

Summary of papers³³

Paper I. Social stratification of men and women in Sweden 1880-2015.

In this study, I describe changes in the social structure of the Swedish workforce over the long term by comparing different historical measures of stratification from early industrialization up until today: social class (HISCLASS), occupational status (HISCAM), and microclass – all based on HISCO. Importantly, I describe how these stratification measures combined describe the social structure of men and women and changing gender differences therein over time. Occupational social status is consequential for various life outcomes, but these consequences depend on the relative position of a given occupation in the social structure, which changes over time.

I situate the changing social structure of men and women in its context of economic and institutional development: economic growth, women's labor force participation, occupational diversification, sectoral change, routine vs. relational work, and skill levels among the workforce. To do so, I align occupational coding from nine full count censuses from 1880 until 1990, and occupational registers from 2001-2016 for a consistent mapping of the social structure across 1810-1985 birth cohorts.

Clear class boundaries characterized the social structure in Sweden in the late nineteenth century; and especially the boundary between the non-manual and educated few on the one hand, and the rest of workers – which were most commonly general laborers, domestic servants, and farmers. I show gradual occupational upgrading and gender convergence among working men and women over the past hundred-fifty years, across all dimensions of social stratification. By the twenty-first century the social structure is rather 'gradational'. By this time, Sweden's workforce is composed of a large diversity of occupations which often can be ordered above or below one another in a status hierarchy, both from a social class and occupational status perspective, but with only incremental differences between them compared to the divide in the social structure of the nineteenth century.

While vertical gender differences largely disappear by the 2000s, important horizontal gender differences in the social structure remain. Microclass overlap between genders shows that reduced gender differences are associated with increases in non-routine work among men, earlier dominated by women. Work in the expanding service sector consists increasingly of care work, including food services and housekeeping, for both men and women.

³³ These are short executive summaries of the individual papers without any references to previous research. For due credit to important contributions, see the actual papers or earlier sections of this introduction.

Occupational upgrading is linked primarily to sectoral change among working men and increases in skill level among working women. Occupational upgrading has been more pronounced for working women than men, especially at the high and low ends of the social structure. This is partly due to the entry of (more experienced) married women into the formal workforce. For men, occupational upgrading has been concentrated among higher social strata, with high-skilled classes growing at the expense of medium-skilled classes, and occupational status mostly increasing above the median – suggesting a polarization. Both with the transition from agriculture to industry, and with the transition from industry to service economy, certain medium-skilled classes were compressed, and high-skilled classes grew. Such polarization is not observed for women.

Paper II. A Schumpeter hotel? Surname status persistence in Sweden 1880-2015.

Conventional social mobility research misses important dimensions of intergenerational persistence. To capture intergenerational persistence of family social status, we need to move beyond parent-child associations in occupation or income. Models that incorporate surname group belonging show that families do not regress to a population mean at the speed implied by parent-child associations. Their mobility is further constrained by their ancestors' social status as operationalized through surname group belonging. Failing to include such group-level processes, summary measures such as intergenerational elasticities in occupational status or income will overestimate the relative importance of individual effort and ability on socioeconomic outcomes.

We study the inheritance of surname status as a group-level process, using full-count population data based on censuses and administrative registers for Sweden between 1880 and 2016. We use surname groups rather than individual surnames as our analyses of the 'informational content' of surnames, the information they provide on social status, show that social stratification by surnames occurs primarily at the level of surname types associated with pre-industrial social strata, rather than at the level of individual lineages – especially before 1950. This is both indicated by the low informational content of individual surnames within most surname groups, and by the high share of the informational content of individual surnames which derives from surname groups.

Surname status persistence, the rate of regression to the mean of surname groups, is almost as high in the modern Swedish welfare state as it was in preindustrial times. The status structure of surname groups converges only at a slow rate, with differences persisting over at least six generations. Structural transformation and the emergence of the welfare state are not associated with lasting increases in surname status persistence. This could be related to the social structure of distinct surname

types; pre-industrial high-status groups are distinguished from the broad majority with common surnames, but among this broad majority little distinction is possible. Welfare states may not equalize opportunities between (broad) elites and the rest.

Exceptionally high surname status inequality in the nineteenth century shows that these pre-industrial social strata formed a highly important dimension in shaping the occupational social structure of that time. Gini coefficients, reflecting the over- or underrepresentation of high- or low-status surname groups in high-status occupations, are as high as 0.8 for elites and 0.4 for the broad lower-status group with an agricultural or working-class surname background (patronyms). By the twenty-first century – ca. six generations later – a substantial part of this inequality has disappeared.

In the late twentieth and twenty-first centuries, persistence is lower than before 1950. The disadvantage of patronyms rapidly disappears as their place at the bottom of the social structure is taken by an increasing population with foreign-born background. Hence, surname status persistence is not only an elite phenomenon, but also reflects the relative status of other social groups.

Paper III. The impact of mothers. Intergenerational mobility in Sweden 1865-2015.

Social mobility studies have traditionally measured parent-child associations using one ‘dominant’ parent to reflect social origin. However, the institutions of family and work have changed substantially over the past hundred-fifty years, in Sweden and elsewhere. The dominant family type in the late nineteenth century was a patriarchic family production unit. With industrialization this shifted to a male breadwinner model in the early twentieth century, in which mothers and fathers work in separate spheres. During the 1970s, this norm again changed in the favor of dual-earner families, in which both fathers and mothers perform formal work.

As the institutions of family and work changed, intergenerational mobility did too. Patterns and trends in occupational intergenerational mobility look different when both parents are considered to shape social origin together. I study these changes using census and register data covering 1865-1985 Swedish birth cohorts and their parents. The father-child, rank-rank correlation in occupational status was stable as Sweden industrialized and subsequently decreased as Sweden transitioned from a male breadwinner to a dual-earner family type. The impact of mothers’ occupational status increased simultaneously, both in the full population and among dual-earner families. That is, not only did mother-child associations increase because more mothers worked, but they also increased among families with working mothers before and after the transition.

In the 1970s, Sweden became a dual-earner society, and among cohorts born since 1960, mothers’ and fathers’ occupational status became roughly equally important

for daughter's occupational status attainment – unlike before. Mother-son associations in dual-earner society are about half as strong as father-son associations; gender continues to play an important role in intergenerational mobility, with the same-gender parent-child association being stronger than the opposite-gender association. This gendered pattern of intergenerational mobility could be related to gender segregation in the social structure.

In societies dominated by male breadwinner or production unit families, a father's occupational status reflects family social origin rather well. Although I already observe clear differences in the respective roles of fathers and mothers in intergenerational mobility by mothers' formal labor force participation historically, overall mobility trends in the population are reflected well by models only including father's occupational status for cohorts born before ca. 1940. Among later cohorts, this is no longer the case and mobility is overestimated if mothers are disregarded.

Patterns of intergenerational mobility differ by social origin, and this is the case across family types. In male breadwinner families, father-child associations are stronger at the higher end of the social structure across time – although this pattern is less pronounced among 1935-50 birth cohorts than either before or after. In dual-earner families, I observe different patterns among mothers and fathers; fathers matter more in higher-status families, while mothers matter more in lower-status families. Again, 1935-50 birth cohorts form an exception; mother-child associations are higher in higher-status families. This could be related to the social gradient in the transition from male breadwinner to dual-earner families; the transition occurred first in higher-status families.

Parental resources are not independent, but accumulate. I observe multiplicative accumulation of fathers' and mothers' status; given a higher occupational status of one parent, the parent-child association for the other parent is somewhat stronger. This pattern is stronger historically than today and stronger for fathers than mothers. Multiplicative accumulation means that parental status is not simply the sum of fathers and mothers, but that parents interact to shape family social origin. Patterns of multiplicative accumulation are not very strong, so a “pooled” approach to parental social origin – averaging the status of both parents – is likely not too far off in practice. Combined, the findings in this paper suggest that both parents need to be included to describe long-term mobility patterns and trends in contemporary contexts where independent work by women is common.

Paper IV. Intergenerational status persistence in Sweden 1865-2015. The impact of occupational and surname status.

This paper contributes to the literature on long-term changes in intergenerational mobility. Social origin is measured comprehensively as a combination of occupational and surname-based social status – both from mothers and fathers. The

paper aims to link an expanding literature on surname status persistence to the conventional field of intergenerational mobility research studying parent-child associations in socioeconomic status. In contrast to much of the previous literature, and building upon paper two in the dissertation, I interpret surname group belonging as a heritable status dimension at the group-level (such as ethnicity), rather than a direct indicator of family lineages.

I find intergenerational occupational mobility to be surprisingly stable in Sweden over the past hundred-fifty years, with rank-rank correlations around 0.27 – comparable to mobility levels in the US both historically and today (Song et al. 2020). This finding of occupational mobility levels comparable to the US is in line with previous literature on occupational and educational mobility, and contrasts with findings in terms of income mobility – which is higher in Sweden (“mobility paradox”).

Pre-industrial surname status forms an important dimension of intergenerational immobility among high-status groups and for high-status attainment; parent-child persistence of occupational status is most pronounced among high-status surname groups, and surname group belonging is consequential for high-status but not for low-status attainment. Long-run mobility trends differ by surname status. Among lower-status surname groups – the majority of the population historically – mobility decreases substantially once the transition away from agriculture is completed. During industrialization, farming origins are not predictive of occupational outcomes in the next generation. Mobility instead increases in the long run among higher-status surname groups, where intergenerational rank-rank correlations were high (0.45) in nineteenth-century Sweden. Intergenerational correlations are similar across surname groups with Swedish origins for late twentieth century birth cohorts.

Most pre-industrial surname groups converge in their mobility levels around the time when comprehensive schooling was introduced, making inequality in educational opportunity a likely cause of surname status inequality. Another possible explanation would be concurrent increases in mother’s labor force participation; before this transition, my only indicator of a mother’s socioeconomic status is her surname group belonging, which may be more important among non-working mothers.

Although pre-industrial surname groups become largely inconsequential for most of the population by the twenty-first century, mobility patterns continue to differ between those with and without a Swedish surname background, and between those with elite pre-industrial surnames and the rest.

Concluding discussion

Our chances to end up in social positions with high or low status are affected by our family background. This has been known for centuries, and studied empirically since at least the 1920s (Sorokin 1927). It forms the premise for this dissertation. In the dissertation I ask how levels and patterns of intergenerational persistence of social status change over the course of economic and institutional development. That is, from right before the time industrialization took off until the current day. I emphasize different components of social status origin, both at the level of families and wider social groups, and ask how their relative importance changes over time. In a broader perspective, these questions are related to the consequences of intergenerational persistence. Persistent inequalities between social groups – whether defined by gender, ethnicity, or pre-industrial social strata – are more tangible at the societal level than intergenerational persistence in individual families. It is difficult to argue that *persisting* inequalities between such groups would be related to individual achievement (meritocratic), and they can therefore lower social trust and undermine social cohesion (Putnam 2000; Rothstein 1998; Savage 2021).

In answering these questions, I limit myself to occupational status as a measure of individual-level social status, and how this dimension of social status interacts with social stratification at the level of social groups: surname group, gender, being Swedish-born, and social class. I find that occupational intergenerational mobility has been surprisingly constant over the past hundred-fifty years (paper three and four, cf. the “constant flux” Erikson and Goldthorpe 1992; Song et al. 2020), with the main change in mobility levels being related to the entry of women into the formal workforce (Ahrensjö et al. 2021).

The distinguished dimensions of social status all play a role in shaping social inequalities: gender through gender segregation of the labor market (paper one, and e.g. Eriksson 2015), and major social stratification by marital status historically (paper three, and e.g. Stanfors and Goldscheider 2017) which to some extent persists today in the form of occupational marriage premia among men (e.g. Bygren and Gähler 2012). Being Swedish-born has become associated with higher status attainment in Sweden in the twenty-first century (especially paper four, and e.g. Behtoui and Neergaard 2010), and bearing a surname reflecting pre-industrial higher social status is associated with higher occupational status attainment across the period of 1880-2016 (paper two and four, and Clark 2012).

These social groups also play a role in shaping intergenerational persistence. The same-gender parent is more important for child status attainment than the opposite-gender parent, at least in dual-earner families (paper three, and e.g. Beller 2009). In male breadwinner society, breadwinner fathers are more strongly associated with child status attainment than dual-earner fathers (paper three, and e.g. Hout 2018).

Surname groups affect intergenerational mobility as well. Parent-child mobility in high-status surname groups is low historically and increases over time, while parent-child mobility is high historically and decreasing over time in the common Swedish lower-status surname group (patronyms, see paper four).

Not only does the occupational status of each parent matter in dual-earner society, but parental status also accumulates: increases in the occupational status of one parent are equally or more strongly associated with increases in the status of the child if the other parent also has high(er) occupational status. The relative importance of fathers and mothers differs across the social structure; fathers matter more for children from high-status origins, while mothers matter more for children from lower status origins (paper three).

Pre-industrial social strata, as reflected by surname groups, shape the status attainment of all children born in Sweden until 1950 and thus reaching occupational maturity until around 1990. Not only the surname group of fathers, but also that of mothers, matters for child status attainment – and to an approximately equal extent. Social distinction of elites, especially the former nobility, persists into the twenty-first century – both in terms of occupational status attainment of their children and marriage patterns (paper four). Surname status ‘*premia*’ are mostly relevant among high-status groups and for high-status attainment; intergenerational surname status persistence is higher at the higher end of the social structure (paper four), as persistence of father’s occupational status (paper three).

Some forms of intergenerational mobility are thus more likely than others, and particularly those in high-status positions can transmit their advantage to their children, so that these positions are relatively difficult to attain for those from other origins (cf. Esping-Andersen 2015). As the public debate on intergenerational mobility often centers around the possibility for upward mobility (‘*rags to riches*’), such low intergenerational mobility at the top of the social structure may be more consequential for the perception of equality of opportunity than other forms of intergenerational mobility.

Social stratification along some social group lines – gender and surname status – has become less relevant in determining social stratification and intergenerational persistence in Sweden over time. However, even today both surname status and gender still determine stratification and mobility to some extent (paper one to four). Being Swedish-born, in contrast, has become substantially more important in determining social stratification and mobility in Sweden (paper four). Occupation-based social group belonging (social class) became less important in determining intergenerational mobility levels as Sweden industrialized, but has again become increasingly important over recent decades; intergenerational mobility levels differ by parental social origin (paper three).

The patterns and changes in intergenerational persistence described in this dissertation relate to important political and public debates. The form of

intergenerational persistence that has been highlighted most in the public debate, is educational inequality – do children from different background get the same chances to learn competences that can help them to realize their potential (based on their talents and hard work) later in life? Are schools able to compensate for differences in quality in learning environment in the parental household? To a certain extent, schools have been able to compensate for differences in parental background in Sweden as elsewhere, although not fully (e.g. Breen and Jonsson 2007; Meghir and Palme 2005; Pfeffer and Hertel 2015). This ability of schools to realize their equalizing role has in more recent decades been heavily contested in the Swedish public debate.³⁴

I do not measure the mediating role of schools in intergenerational mobility directly, but I do study cohorts of both parents and children born before a substantial expansion of public schooling as well as after. If there existed substantial unequal opportunities that were equalized by education, then we would expect to see the equalizing effect of schooling reflected in increasing occupational intergenerational mobility over these cohorts. Occupational mobility does appear to increase specifically for cohorts growing up before and after the introduction of nine-year universal public schooling (*grundskola*, introduced 1962) in Sweden (see paper three and 4). However, this change occurs simultaneously with the shift from male breadwinner to dual-earner society, and I can only speculate on the degree to which these caused levels of mobility to change. Moreover, no substantial and long-lasting increases in occupational mobility in Sweden over the past hundred-fifty years are observed. If education is a major equalizer – as is often found in the literature – then the initial equalizing effect of schooling is compensated for in later cohorts either by active parental strategies (e.g. Fiel 2020; Pöyliö et al. 2018), or by increasing intergenerational persistence through other channels.³⁵

Another form of inequality of opportunity that has received much attention in recent decades are inequalities by ethnicity or migrant status. Swedish-born with Swedish-born parents are paid more for the same jobs, are more likely to be a part of the formal workforce, and are less likely to live in segregated neighborhoods with low

³⁴ Only this year (2022), the Swedish public TV channel broadcasted two TV series dedicated to the question on the quality of Swedish schools (*Vem mördade skolan?* [Who murdered the school?] and *Det svenska skolexperimentet* [The Swedish school experiment]), both reflecting on deteriorations in school quality in recent decades. Both programs raise increasing inequality of opportunity as a growing issue in Swedish schools since decentralization and privatization in the 1990s. Already in 2011, Swedish public radio published a series on a similar topic (*Den orättvisa skolan* [The unfair school]). In newspapers with different political affiliations the ‘school issue’ is also heavily debated (see opinion pieces in [SvD 2-4-2022](#); in [DN 8-4-2022](#); and in [Aftonbladet 25-5-2022](#)).

³⁵ See also the debate on the *compositional* effect of educational expansion on social mobility, which would be short-lived, and the *equalizing* effect, which would be more permanent (e.g. Breen and Jonsson 2007). And a debate on measurement error in educational mobility resembling the debate for other forms of intergenerational mobility studied in this dissertation (Fiel 2020).

socio-economic status, worse schooling, and higher crime rates (e.g. Arai and Skogman Thoursie 2009; Behtoui et al. 2019; Behtoui and Neergaard 2010). From a long-term perspective, this Swedish-born advantage is a new problem for Swedish society, as the country developed from a high emigration to a high immigration nation (e.g. Statistics Sweden 2016). Immigrant disadvantages are reflected in this dissertation when I study surname status; those without an ancestor surname in 1950, mostly immigrants or descendants of immigrants, have an increasingly low occupational status in Sweden over the period 1960-2016 (see paper two and four). The disadvantage of foreign-born as a group is largely explained by lower parental occupational status, but also when this group has high parental occupational status they are less likely to see this reflected in their own status attainment than their Swedish-born peers; in recent cohorts intergenerational occupational mobility is substantially lower among those with a Swedish-born background (see paper four).

Finally, intergenerational persistence at the top of the social structure has been highlighted in the public debate as well as the academic literature. Possibly inspired by the popularity of the work on top income inequality by Thomas Piketty (Piketty 2014, 2022), the role of wealth in intergenerational mobility has received much attention in recent years (e.g. Adermon, Lindahl, and Waldenström 2018; Hällsten and Thaning 2021; Pfeffer and Killewald 2018). The introduction of pre-industrial social strata as another social status dimension broadens this debate. Wealth could be an important mechanism in high surname status persistence, especially among high-status surname groups historically (as seen in paper two and four). But surname groups reflect more than money. They reflect political, cultural, social and human capital of high-status groups historically and are inherently more persistent than top wealth or income percentiles. I do not only observe surname status persistence over generations, but I also see surname homogamy across cohorts – especially among high-status groups. The Swedish nobility today can still exchange their social status with wealth on the marriage market (Almenberg and Dreber 2009), indicating that the two dimensions complement each other.

Returning to the overall research question, on changing patterns of intergenerational persistence over the course of economic and institutional development, this dissertation contributes to the larger scientific debates and contemporary society by broadening the field of social stratification and mobility studies. The common focus on one or two dimensions of social stratification, such as gender, ethnicity, or education, does not suffice to understand overall patterns of intergenerational persistence at a societal level. Dimensions of social status interact in complex ways and together shape social stratification and opportunities for subsequent generations. Some dimensions of social status may appear to have disappeared with long-term economic and institutional development towards equality of opportunity, such as pre-industrial social status or multiple-generation migrant origin, but to some extent persist and thereby create unequal opportunity structures.

Future research could expand upon this work in several ways. Importantly, this dissertation has been limited to the use of occupational information in defining socioeconomic status. It is by now clear from the wider intergenerational mobility literature that different dimensions of socioeconomic status complement each other (e.g. Adermon et al. 2021; Breen et al. 2016; Hällsten and Thaning 2021; Vosters and Nybom 2017), and therefore the results found here do not necessarily apply to economic, educational, or other forms of stratification. The relationships between pre-industrial social strata (defined by surname type) and education and wealth would be relevant to study; their relationship with educational attainment would shed light on the role of educational reforms in transforming the opportunity structure from ascription- to achievement-based. The relationship between wealth and pre-industrial social strata would both shed light on patterns of persistence in terms of the wealth distribution, and on the extent to which wealth and pre-industrial social strata were and are linked.

Beyond processes of intergenerational persistence, the consequences of social stratification by surname type could be studied more broadly; they could play a role in shaping voting behaviour, attitudes and aspirations, social trust, social networks, or homogamy, endogamy, etc.

Moreover, the surname, gender and family type perspective on intergenerational persistence could be combined with promising new methods in the broader field of intergenerational mobility research. Sibling and extended ‘horizontal’ family members, such as first- and higher-order cousins, could be studied instead of parent-child pairs. This would include other dimensions of social environment not captured here and abstract from structural and institutional development (e.g., Breen and Jonsson 2005; Karlson and Birkelund 2022). For an even broader understanding of an individual’s chances to move up or down on the social ladder, long-term socioeconomic differences in demographic processes should be accounted for; this could be achieved with a prospective rather than retrospective study design (cf. Song 2021; Song and Mare 2015). Over the long term, differences in fertility and mortality could interact in interesting ways with social status origin to shape socioeconomic outcomes of lineages.

The transition in terms of the broader social structure from social inequalities determined by pre-industrial social status, gender, and marital status, towards social inequalities determined by country of birth and social class origin, also deserves further attention.³⁶ While social inequalities by ethnicity, race, and migrant status are already the topic of a broad field of research, surnames could provide a new perspective on such inequalities. Name-changing of ethnic minorities as an

³⁶ With the increasing importance of social class origin in shaping social inequalities, I here mean the increasing heterogeneity in intergenerational mobility levels by social origin across 1935-1985 birth cohorts – in terms of economic mobility as found in other studies, and in terms of occupational mobility as found in this dissertation.

integration strategy has been studied previously – both for old and new ethnic minorities in Sweden (see e.g. Arai and Skogman Thoursie 2009; Frändén 2010, 2014, 2020). This perspective could be extended to lower social class origins; to what extent is name changing used (successfully) among these groups to achieve upward mobility (cf. Brylla 2005)?

Surnames are often kept unchanged over many generations. Therefore, surnames associated with ethnic minorities distinguish individuals differently than migrant status does – they do not reflect current immigration history but rather ethnicity (or race). Surname types with different ethnic or racial connotations could therefore be used to disentangle social inequalities based on migration status as such – whether first-, second-, or third- generation, from social inequalities based on ethnicity. This would be an interesting way forward to study processes behind, and persistence of, social inequalities based on ethnicity in Sweden today.

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Paper I



Social stratification of men and women in Sweden 1880-2015³⁷

Elien Dalman

Abstract: In this study, I describe changes in the social structure of the Swedish workforce over the long term by comparing different historical measures of stratification from early industrialization up until today: social class (HISCLASS), occupational status (HISCAM), and microclass – all based on HISCO. Importantly, I describe how these stratification measures combined describe the social structure of men and women and changing gender differences therein over time. Occupational social status is consequential for various life outcomes, but the meaning of a person's social status depends on its relative position in the social structure they live in. I situate the changing social structure in its context of structural transformation: economic growth, women's labor force participation, occupational diversification, sectoral change, routine vs. relational work, and skill levels among the workforce. To do so, I align occupational coding from nine full count censuses from 1880 until 1990, and occupational registers from 2001-2016 for a consistent mapping across 1810-1985 birth cohorts. I show gradual occupational upgrading and gender convergence among working men and women over the past hundred-fifty years, across all dimensions of social stratification. This is linked primarily to sectoral change (industrialization and post-industrialization) among working men and increases in skill level among working women. While vertical gender differences largely disappear by the 2000s, important horizontal gender differences in the social structure remain. Microclass overlap between genders shows that reduced gender differences are associated with increases in non-routine work among men, earlier dominated by women. Occupational upgrading has been more pronounced for working women than men, especially at the high and low end of the social structure. For men, occupational upgrading has been concentrated among higher social strata, with high-skilled classes growing at the expense of medium-skilled classes, and occupational status mostly increasing above the median – suggesting polarization during the industrialization and post-industrialization phases. Such polarization is not observed for women.

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Introduction

Interest in economic inequality has been strong over the past few decades (e.g. Milanovic 2016; Piketty 2014; Savage 2021; Sen 1992). At the same time, however, interest in social stratification has declined. The question of whether social class is at all relevant in today's world has repeatedly been asked in Swedish (Edling and Liljeros 2010; Oskarson, Bengtsson, and Berglund 2010) and international contexts (Crompton 2008; Pakulski and Waters 1996). However, studies consistently show differences in social networks, partner choice, cultural and political preferences between individuals with different social backgrounds and classes (Chudnovskaya and Kashyap 2020; Katz-Gerro 2002; Lindell 2018). Not only do preferences and behavior differ, but class background also affects economic, educational, demographic and health outcomes (Bengtsson and Dribe 2011; Dribe and Karlsson 2021; Dribe and Smith 2021; Ericsson et al. 2019; Evertsson and Magnusson 2014; Hannemann 2012; Lindström 2000; Öberg 2014). Thus, social class differences are consequential in practice and form an important dimension of inequality.

The social structure of the entire Swedish workforce changed fundamentally over the period of 1880-2016. Over this period, Sweden transformed economically, politically, and socially. In 1880, Sweden was a largely agricultural, rather undemocratic society without a welfare state, with limited schooling for the majority, and with little formalized work outside of the household performed by women – especially after marriage. Women worked, but often in family production units headed by their husbands or fathers (Stanfors and Goldscheider 2017). By 2015, Swedish society had first industrialized and then transformed further into a service economy. First primary and then secondary and higher education had expanded. The arrival of the welfare state led to improving working conditions, the introduction of public social securities, and family policies. Sweden had transformed into a country with high labor force participation among women.

Several of the technological and social changes characterizing these processes of industrialization and post-industrialization have bearing on the social structure of Swedish society, as they led to specialization and occupational diversification, sectoral change, shifting work tasks, and broadly increased the skill level of the workforce (Acemoglu and Autor 2011; Goldin and Katz 2008; Oesch 2013). The impact of technological and educational development on the social structure of developed economies after 1975 has been debated, and it has been linked to polarization – of earnings, skill levels, occupational status, tasks, or other job characteristics – as well as upgrading (e.g. Acemoglu and Autor 2011; Adermon and Gustavsson 2015; Autor and Dorn 2013; Oesch 2013; Oesch and Piccitto 2019).

I describe the social structure of working men and women in this fundamentally changing context. To understand changing patterns of social stratification and gender differences therein, I use multiple dimensions of social stratification and

demonstrate how they interact with each other and with gender. I first describe the social structure as it is conventionally done, using big social classes (HISCLASS, Van Leeuwen and Maas 2011). I link changes over time in the social structure to structural transformations of the economy and society, to explain how the social structure is affected by its context. Importantly, I discuss how these processes affect the social structure of men and women differently. I demonstrate how the hierarchical dimension of the social structure changes over time and differs by gender, using a social network-based measure of occupational status (HISCAM, Lambert et al. 2013). I show how social classes differ ‘vertically’ in their occupational status over time and by gender. Finally, I describe ‘horizontal’ gender differences and ‘horizontal’ changes in the social structure over time using microclasses, with a focus on (non-)routine tasks (Acemoglu and Autor 2011; Magnusson and Tåhlin 2018; Oesch 2013).

A comprehensive descriptive study of social stratification and changes therein over the long-term and up to today is lacking (e.g. van Leeuwen 2020), while social class is used extensively to explain life outcomes. In many contexts, it is difficult to describe social stratification of the full population or a representative sample thereof continuously from an agrarian society until today. Either data is not available for all time periods, or there are substantial source differences compromising comparability over the long term. This is what I will do for the Swedish case. To do so, I use full-count census data and population registers in which I observe individual-level occupational titles historically and standardize occupational coding using HISCO (Leeuwen, Maas, and Miles 2002). I create a translation key from Nordic occupational coding used during 1960-1990 to HISCO, incorporating different dimensions of occupational differences (product, authority, ownership, skill, and expertise) by basing it on both the Swedish *Socioekonomisk indelning* (SEI) and *Nordisk yrkesklassificering* (NYK) – two contemporary occupational classification schemes (Statistics Sweden 1982, 1989b).

I cover birth cohorts born from 1810 until 1985 as far as they are living in Sweden over the period from 1880-2015. Earlier studies on long-term changes in the social structure of Sweden or other countries have been hampered by the lack of standardized occupational coding and stratification measures (e.g. van Leeuwen 2020; van Leeuwen and Maas 2010). Such measures have however been developed over the past two decades, and now span a range of social stratification dimensions comparable to that available in a contemporary context (Griffiths et al. 2019; Lambert et al. 2013; Leeuwen et al. 2002; Van Leeuwen and Maas 2011). I use these to study long-term changes in the Swedish social structure.

I do this separately for men and women. Women’s changing labor force participation means that selection of women into the (formal) workforce changes over time and differs fundamentally from that of men (Goldin 1995; Stanfors and Goldscheider 2017). Moreover, what men and women work with differs as the workforce is gender segregated both ‘horizontally’ – in terms of work tasks – and

‘vertically’ – in terms of occupational status (Bettio, Verashchagina, and Camilleri-Cassar 2009; Jarman, Blackburn, and Racko 2012). Unlike long-term changes in pay and labor force participation of women, long-term changes in the social structure of women in the workforce have been described to a very limited extent (e.g. in the case of Sweden, Sjöholm 1983).

Studying changes in the social structure over the long term is essential for our understanding of stratification processes and their impact on other dimensions of life. Differences in the social structure over time imply that the same occupation or social class changes its relative position in a society’s social structure. With such changes, a discrepancy arises between absolute, or nominal, persistence, and relative persistence of social status. Whether an individual has the same occupational status or social class position at two different points in time, or the same as their parents, can then be split into two distinct but both important questions: First, do they have the same *relative* position, for example the same rank in a hierarchy of occupations created at each point in time? Under a changing social structure the same relative position would generally imply a different *absolute* position. A very different question therefore is whether they have the same *absolute* position, for example by holding the exact same occupation as their parent or younger self. Concretely, occupational upgrading of the population results in many occupations that were ‘elite’ – or highest status among contemporaries – in 1880, becoming ‘middle class’ – or rather common among contemporaries – during the twentieth century. Occupational groups such as that of artisans shifted from being relatively higher-status to lower-status compared to the contemporary social structure. Thus, a consistent description of the social structure of Sweden over time gives anyone studying causes or consequences of social stratification a context in which to interpret the relative social status of an occupation or social class.

The paper continues as follows. Section two covers the economic context, followed by a short description of previous research on the social structure of the Swedish workforce over the long term. Section three describes the data and method used. Results are presented in section four and I finish with a concluding discussion in section five.

Background

Swedish society transformed fundamentally over the past hundred-fifty years as industrialization and post-industrialization processes occurred. Several of these changes will likely be reflected in changes in social stratification. In this section, I summarize the potential relationship between social stratification and structural transformations of the Swedish economy, with a focus on economic growth, occupational diversification, sectoral change, skill levels among the workforce, and women's labor force participation.

Structural transformations of the Swedish economy

Swedish industrialization occurred rapidly and took off in the decades around 1900. From 1890 until the middle of the twentieth century, the country outpaced the rest of the world in terms of economic growth, and especially in the earlier period in terms of real wage growth (Schön 2012).³⁸ Until 1850, the Swedish population had been largely agricultural and demand for household goods had been met by homecrafts production. Over the following century, this changed entirely. Due in part to high real wage growth in the first phase of industrialization, market consumption grew rapidly. Consequently, the social structure changed in favor of skilled and non-manual occupations.

Lennart Schön (2012) describes the long-term developments in Sweden's occupational structure. In 1850, about half of Sweden's national product was generated in the primary sector, and the employment share was substantially higher. The share of agriculture in GDP had decreased to one-third by 1890, when 58% of the working population was still employed in the primary sector. Employment in the primary sector subsequently declined to 19% in 1950 and only 2.5% by 2010. Between 1890 and 1950, employment in the secondary sector increased from 27% to 50% of the workforce. Subsequently, employment in the secondary sector decreased to 33% in 2010. Thus, the late nineteenth and first half of the twentieth century marked an important shift from predominantly agricultural to predominantly industrial on the Swedish labor market. During the past fifty years, the Swedish economy became post-industrial, as services rather than industry came to dominate the labor market from 1970. Employment in the tertiary sector increased from 16% in 1890 to 31% in 1950 and continued to increase to 65% in 2010 (Schön, 2012, p. 126, 206, 297, 331, 403 for statistics).

³⁸ Annual GDP growth (real wage growth) Sweden 1870-1910 1.7% (2.8%), compared to France, Britain and Germany 1.2% (1.1%), the United States 1.6% (1.1%) (Schön 2012), p. 192). Annual GDP per capita growth Sweden 1910-1930 2.0%, compared to the rest of Europe 1.4%, and North America 1.6% (idem p. 191). Annual GDP per capita growth Sweden 1930-1950 2.6%, compared to the rest of Europe 0.9%, and North America 2.1% (idem, p. 287).

Sectoral change and economic growth were combined with large increases in human capital among the Swedish workforce across the period of the late nineteenth and twentieth century (Ljungberg and Nilsson 2009). As in the US, the expansion of mass schooling and skill-biased technological change associated with industrialization reinforced each other (Goldin and Katz 2008; Katz and Murphy 1992; Ljungberg and Nilsson 2009). The expansion of mass schooling could keep up with technological development, which increased the supply of skilled workers and may have reduced skill premia. During post-industrialization, human capital increases could not keep up with technological development, which is instead theorized to increase skill premia (Goldin and Katz 2008; Ljungberg and Nilsson 2009).

During post-industrialization, technological change reduced the demand for routine-biased work while not affecting non-routine work. Routine-biased work is often positioned around the middle of the social structure or earnings distribution (Acemoglu and Autor 2011), and therefore the decreasing demand for such work may lead to polarization of the social structure (cf. in Sweden Adermon and Gustavsson 2015). The position of routine-based work in the social structure is however not set in stone, and the effects of technological change likely differ in different institutional contexts (Haslberger 2021). Other societal developments, such as population aging, increase the demand for non-routine work across the social structure, and may offset the effects of routine-biased technological change. Routine-biased technological change may lead to occupational upgrading as well as polarization in different dimensions of the social structure, and its effects appear to differ between contexts (Oesch 2013; Oesch and Piccitto 2019). Importantly, as routine tasks are more common in the social structure of men than that of women, the specific effect of routine-biased technological change is likely to differ substantially by gender.

Women in the workforce

Labor force participation rates of women increased dramatically over the course of the twentieth century. During the first half of the century, only about one in three women was gainfully employed. By 1990, women and men participated in the workforce to the same extent (80%, see e.g. Stanfors and Goldscheider 2017). Around 1880, Sweden was still largely a peasant society. In such a society, the position of women in the workforce was ambiguous, households were both consumption and agrarian production units. Often only the head of household was formally registered with a farming occupation, while his wife and children often also performed tasks on the farm without holding documented occupations (e.g. Nyberg, 1994). Similar arrangements could be found among other self-employed and small business owners, such as bakers or shoemakers. If we see these women in family production units as part of the workforce, then women's participation rates

form a U-shaped development instead; first decreasing as the male breadwinner family came to dominate, and then increasing with the dual-earner family type (Goldin 1995; Molinder 2021; Stanfors and Goldscheider 2017).

With industrialization, men moved into industrial occupations. Such jobs were less commonly occupied by women. Women often worked in domestic service before marriage and exited the formal workforce upon marriage – often to work in family production units. During the first half of the twentieth century, women’s work opportunities outside of the household improved as the trade and services sector expanded with jobs seen by contemporaries as suitable for women (Stanfors 2014). Throughout the twentieth century, occupations continued to be segregated by gender. Women often work with people – relational work – while men often work with things – production work (Magnusson and Tåhlin 2018). Relational occupations are concentrated in the public sector and production work often happens in private sector employment. I discuss men’s and women’s participation rates in the formal workforce, i.e. outside of the family production unit, as observed in this paper in the first section of the results.

The previous literature shows that historically, married women contributed to production to a larger extent than captured by formal registration such as the censuses used here. In contrast, in recent decades, participation reflects not only full-time work but also parental leave and part-time work (Stanfors 2014). As the institution of marriage became less universal since 1970, its consequences for women’s labor force participation also virtually disappeared; women no longer left their jobs upon marriage. This means that although changes in formal labor force participation are dramatic, actual changes in women’s work are less pronounced (Molinder 2021; Stanfors 2014). Women’s work as observed in this study does not reflect all women’s work but does reflect the part of such work that is enumerated and recognized in the same way that men’s work is.

Labor force participation of men and women over time has been documented by Statistics Sweden using workforce surveys (*Arbetskraftsundersökningarna*, AKU) since 1965 (Statistics Sweden 2021). Participation of men and women in the period before 1965 as derived from censuses is summarized in various studies (Molinder 2021; Silenstam 1970; Stanfors 2014). Their work shows that censuses underestimated women’s work as the focus of censuses was on distinguishing full-time work outside of family production units. According to Molinder’s estimates, women’s labor force participation was as high in the late nineteenth century as in the late twentieth century, and was at its lowest point in the 1950s during the heyday of the male breadwinner family type (Molinder 2021, Figure 4).

Molinder (2021) suggests that the actual share of working women could be more than twice as high as what is reported in the census material, especially because of married women’s work in family production units including farms (see also Stanfors 2014). In other work, I find that a husband’s social class or status in a male

breadwinner society generally describes the social class or status of their wives well, at least in terms of intergenerational mobility (Dalman 2022). This means that the social structure of men described historically to some extent also reflects the social structure of married women, and the described social structure of women mostly reflects that of single or widowed women. The changing share of women in the (formal) workforce has likely affected the social structure of both men and women, as it affected the supply of women's labor as well as demand for specific types of labor. In particular, women's increasing labor force participation is linked to certain types of unpaid work being formalized as paid work (Lewis, Campbell, and Huerta 2008).

The social structure of the Swedish workforce

Social stratification of the Swedish workforce, and changes therein, are often described in studies on socioeconomic inequalities in other outcomes or studies on social mobility. Many such studies cover a rather short time period, often not more than twenty-five years (e.g. Jonsson, 1998, 2004). Alternatively, the class structure of the full workforce is not described but rather the class structure of families of origin – excluding most mothers and all those without children (e.g. Evertsson & Magnusson, 2014). When such studies have used a 'big class' scheme this has often been the EGP class scheme, a Weberian class scheme developed primarily for the comparative study of social mobility (Erikson, Goldthorpe, and Portocarero 1979, 1983). Intergenerational mobility studies have in recent years increasingly used microclasses and continuous occupational status scales over big class schemes (Jonsson et al. 2009; Thaning and Hällsten 2020). These may be preferable in explaining outcomes, but they blur our understanding of the social structure of society and social inequalities.

The most comprehensive description of social stratification of the Swedish workforce over the course of the twentieth century can be found in the combined work by Göran Ahrne and his collaborators (Ahrne 1988; Ahrne, Stöber, and Thaning 2018; Ahrne and Wright 1983). Ahrne maps social stratification in Sweden over 1920-2015 in the Marxist spirit of Erik Olin Wright (Wright 1997). Figure 1 summarizes the Swedish class structure over time based on his work.

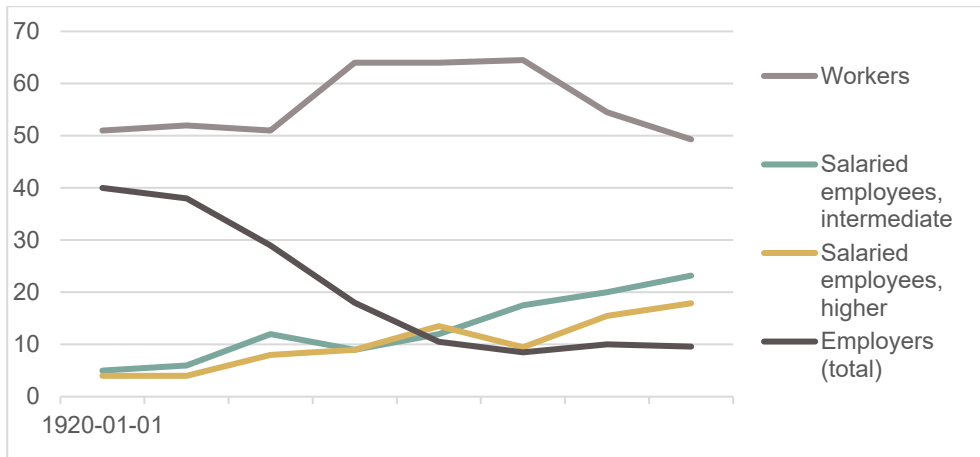


Figure 1 Social stratification of the Swedish workforce 1920-2015: Based on the combined work by Göran Ahrne and collaborators (Ahrne 1988; Ahrne et al. 2018).³⁹

Figure 1 shows a majority of the Swedish workforce being defined as ‘workers’ over the past one-hundred years. Changes over time are to be found in the groups of employers and self-employed on the one hand, and salaried employees on the other hand. Self-employed are replaced by managers and professionals, while workers form a constant majority of the workforce.

There are several limitations to the social class mapping of Sweden described above. The class scheme used is non-standard and changes over time. Both of these limitations make comparison between countries or time periods difficult. The allocation of occupations to classes also changes over time; some occupations are first defined as white-collar and later as blue-collar.⁴⁰ The classification thereby disguises part of the changing relative position of occupations and social classes over time. A substantial part of ‘employers’ in the early period are assisting family members such as wives of farmers, while women in the later period are only included if they themselves participate in the formal workforce. The group of ‘employers’ is heterogenous in terms of sector, authority, skill and expertise –

³⁹ Full workforce with no age or gender limitation in most years (16-64 years old from 1985). Based on full-count census or register data in 1920-1970 and 1985-2015, in 1980 based on survey data (N=1145). In 1950: those working “the greater part of a normal working day”, 1960 and 1970 at least half-time work. Employers and self-employed include assisting family members, including 60% of farmers’ wives (as estimate of those assisting). Assisting grown-up children generally registered as employees. Devision blue-collar and white-collar example: nurses are considered white-collar (salaried employees), while hospital aides blue-collar (workers). Salesmen and shop-assistants are classified as workers; some office personnel (“a layer of proletarianized office workers”, e.g. janitor) are white-collar 1920-1950 but blue-collar afterwards.

⁴⁰ For example, from 1985 all “*lägre tjänstemän*” (lower white-collar workers) are allocated to the working class.

ranging from farmers and small shop-owners to large business owners. The gender composition of the workforce changes over time, but only from 1985 is social stratification separated by gender (and migrant status, see Ahrne et al. 2018). In this work, they also show that broad social classes are still reflected in different economic outcomes in 2015 Sweden – although the majority of economic inequalities are to be found within social classes. Before Ahrne, Göran Therborn described Sweden’s class structure over the period of 1930-70 (Therborn 1973). This work was supplemented by Tommy Sjöholm, who mapped the share of women in the Swedish class structure over the period of 1910-1975 (Sjöholm 1983).

Among more recent studies using a similar class scheme as used in this paper, descriptions of the social structure over time often do not reflect all men or women, but rather the ‘dominant’ parent is taken to reflect social origin in mobility (Erikson 1984). Parental social background is described across the 1892-1991 birth cohorts in several studies on class outcomes in Sweden (Breen and Jonsson 2020, fig. 4; Evertsson and Magnusson 2014, fig. 6). They show general occupational upgrading of the Swedish workforce over the past hundred-fifty years, closely linked to contemporary structural transformation, with growing high-skilled and non-manual classes and a decimating of the farming class. Such a depiction is however not intended to represent the full workforce. It excludes most mothers and all men and women without children. It also is affected by socioeconomic differences in mortality and career mobility, as the social structure is observed retrospectively (from 1976-2007) and through children. Children describe their own, as well as their parents’, occupations at different ages among different cohorts. Among occupationally mature child cohorts, the social structure is described by gender over the 1906-1972 birth cohorts by Richard Breen and Jan Jonsson (Breen and Jonsson 2020). Their account shows stronger occupational upgrading among men than among women, and gender convergence between men’s and women’s class structure. Changes over time should be interpreted cautiously as early cohorts are observed at rather high ages, while late cohorts are observed at rather young ages. Thus, age (or lifecourse) effects counteract cohort effects and from a period-based perspective (as used in this paper) the time span covered is limited to the years 1976-2007. Generally, these accounts cover broad changes over the long term well, but cannot be interpreted at a more detailed level.

Data and Methods

I use historical census and tax register data for the years 1880-1950 together with official register data from censuses and population registers for the years 1960-2016. The historical censuses of 1880, 1890, 1900 and 1910 cover the full population (4.6-5.6 million individuals). These censuses were not the results of traditional enumerations as in for example the United States, but based on continuous parish registers maintained by the Lutheran church. Every decade, priests created excerpts of their continuous parish registers. Enumeration was therefore not dependent on the numeracy and literacy of the population. The censuses include individual information about, e.g., sex, age, family relations, birth parish and county and current place of residency (Swedish National Archives 2011a [1890], 2011b [1900], 2014 [1880], 2016 [1910]). In the historical censuses, occupational information is recorded and has been coded into HISCO (van Leeuwen, Maas and Miles 2002) within the SwedPop project (www.swedpop.se).

The 1950 census is based on the poll-tax register, an end-of-year summary of information on individual residents kept by the county administrations. Like the historical censuses, the 1950 census includes individual characteristics such as sex, age, birth parish and county and current place of residency. It also includes detailed information on places of residency in preceding years (Arkiv Digital 2015). Individuals are linked to their marital partners and their children under the age of 17. Occupational information is recorded in string form which have been coded into HISCO (within the SwedPop project, as for the 1880-1910 censuses).

The contemporary census data is provided by Statistics Sweden in a project on socioeconomic stratification (*Socioekonomisk stratifiering, familjebildning och barnafödande i ett historiskt perspektiv*, PI: Martin Dribe). In this material, I have access to complete census data for the years 1960-1990 (*Folk- och Bostadsräkningar*, FoB), as well as information on presence in Sweden from the population registers (*Registret över totalbefolkningen*, RTB). For the years 2001-2016, contemporary register data from the Swedish Interdisciplinary Panel (SIP) are used. SIP is a compilation of multiple official registers and census data starting in 1960, and maintained by the Centre for Economic Demography, Lund University (PI: Jonas Helgertz). Within SIP, this study makes use of the 2001-2016 occupational registers (*Yrkesregistret*) and population registers (RTB) from Statistics Sweden. Self-reported information on individuals' occupations is recorded in the censuses of 1960, 1970, 1975, 1980, 1985 and 1990, while annual employers' information on individuals' occupations is recorded from 2001 to 2016 in occupational registers reflecting current employment.

The occupational registers have some limitations in terms of occupational coverage. The occupational register misses most individuals in project employment, owners/proprietors without a registered wage and the self-employed (with at most

one employee). This includes occupations such as consultants (high status) or small shop-owners (low status). In general, coverage is better for the public than private sector and therefore better for women than men.⁴¹ These limitations result in underrepresentation of immigrants (e.g. who are small shop-owners) but also high-status individuals among observed occupations after 2001.

The workforce is defined as those between the ages of 15 and 70 observed as working in each census or benchmark year (2002, 2010, 2015). I split some results by age category (15-30, 30-45, 45-60, and 60-70) in order to demonstrate changes over the life-course as well as over economic development. Occupations at younger ages are generally lower-skilled and less an indication of social standing of an individual than occupations at mature ages — both historically and today. Careers progress over the life-course and therefore the social structure differs between age groups. As I observe, historically women's work mostly before marriage (see figure 2) and career progression over the life course is an important factor in women's changing social structure over time in Sweden.

Historically, occupations at younger ages may be on-the-job training or a way to save capital for a future career, activities that in later periods are incorporated in the educational and welfare system. For example, farmers and farmers' wives often started their career as agricultural or domestic servants (e.g. Lundh, 2004). In more recent decades, occupational maturity is reached at increasingly high ages and this differs by educational attainment (e.g. Gottfries, 2018). Similarly, in most countries, career mobility has increased and occupational maturity – the age at which career progression decelerates – is achieved at increasingly high ages (Kalleberg and Mouw 2018). It is increasingly common for occupations held by individuals in their twenties to be precarious (side jobs, temporary jobs), and not reflect later occupational status (e.g. Savage et al., 2013).

To be able to apply consistent social stratification measures to source data from 1880 until 2016, I have linked Swedish occupational coding as used in the 1960-90 censuses to the HISCO coding scheme widely used in historical studies of social stratification. The process followed in creating this link is described in the appendix to this paper (titled 'creating a uniform occupational coding across time').

Measuring social stratification: class and status

Social status can be conceptualized in different ways. While traditionally 'big classes' have been most popular, for example the EGP class scheme, smaller 'microclasses' may better reflect meaningful units in social space (Bihagen and Halleröd 2000; Erikson et al. 1979). Large classes may hide too much meaningful variation in social status (Weeden and Grusky 2005). For example, much of the

⁴¹ For more details, see [SCB \(2011\)](#).

intergenerational persistence of big classes can be attributed to persistence in microclasses (Griffiths et al. 2019; Grusky et al. 2008; Jonsson et al. 2009). I operationalize social stratification using both bigger social classes based on HISCLASS and microclasses based on HISCO occupational coding (Griffiths et al. 2019; Leeuwen et al. 2002; Van Leeuwen and Maas 2011). Microclasses can conceptually be seen as occupational networks in which relevant resources are exchanged (Weeden and Grusky 2005). On top of dimensions of stratification reflected by big classes – such as skill levels and labor relations, microclasses also reflect dimensions of stratification such as specialist (workplace-specific) skills and knowledge (van Leeuwen 2020). Depending on the content of occupations, microclasses can therefore be rather broad (e.g. office and clerical workers), or very specific (e.g. bakers or lawyers).

In class schemes inspired by Weberian class theory, such as the EGP class scheme, reciprocal dependence relations between workers and employers are often considered of central importance (Erikson and Goldthorpe 1992). Empirical studies in the Swedish context generally find these dependence relations to be rather inconsequential for social inequality. Differences in skill requirements between jobs create important distinctions in terms of earnings and occupational status (Le Grand and Tåhlin 2013; Tåhlin 2007). The employer-employee dichotomy is complicated to apply to social stratification of both men and women, as women are less likely to hold employer positions than men, while in recent periods they are not less often employed in supervisory roles (see microclass results in appendix table A.1). Furthermore, it is complicated to apply this dichotomy to social stratification over the long term, as positions with high authority and autonomy commonly held by employers until the early twentieth century became managerial employee positions in the later twentieth century. Furthermore, differences between low-skilled, non-manual (relational) jobs and low-skilled, manual (industrial or agricultural) jobs are horizontal in terms of occupational status and earnings; they mainly reflect gender segregation of the labor market (Magnusson and Tåhlin 2018).

These considerations make the EGP class scheme less suitable for measuring social stratification over the long term and by gender. The HISCLASS scheme – although also based on Weberian class theory – is less sensitive to the above described issues (Van Leeuwen and Maas 2011). Compared to the EGP class scheme, the HISCLASS scheme does not distinguish supervision tasks by their managerial or employer nature, making it less sensitive to changes therein over time. Beside the manual/non-manual divide and supervision tasks, social classes in HISCLASS are distinguished based on skill levels and economic sector. The distinction of skill levels is important given the importance of skill levels for class outcomes. The distinction of the primary sector is important for a class scheme applied to a context undergoing major structural transformation, especially as the quality of occupational coverage for men and women differs between farm and non-farm work.

In this paper, HISCO-coded occupations are transformed into eight big social classes using the HISCLASS scheme. This results in the following eight classes: 1) higher managers, 2) higher professionals, 3) lower managers, 4) lower professionals and medium-skilled clerical and sales workers, 5) lower-skilled clerical and sales workers, 6) medium-skilled manual workers and foremen (HISCLASS 6-7), 7) farmers and fishermen (HISCLASS 8), and 8) low- and unskilled farm and non-farm workers (HISCLASS 9-12). The source data does not allow for a reliable distinction between low- and unskilled manual workers on farms and elsewhere, as general occupational titles (e.g. *piga*, *arbetare*) are common here. Moreover, farm workers virtually disappear over time as I study Sweden also after industrialization.

The skill-level distinctions used here are more detailed than in for example the EGP class scheme, in line with the established importance of skill level for both earnings and occupational status (e.g. Tåhlin, 2007). More specifically, low- or unskilled manual workers are assumed to generally have undergone less than one year of training (here classes 5 and 8). The expected training duration of medium-skilled workers is 1-10 years (classes 3-4 and 6-7). Training of higher managers and higher professionals is assumed to be more than 10 years (classes 1-2, see Van Leeuwen & Maas, 2011, p. 51). Educational attainment of the workforce changes substantially over the period studied here, and also the educational requirements of specific occupations. Arguably, occupations that historically had the above-described same skill requirements can still be grouped as one social class with similar social status in modern times – although the actual number of years and days of training of those occupying these classes will have generally increased substantially.

I also operationalize social stratification using microclasses. Microclasses are defined as (groups of) occupations which are seen as reflecting ‘classes’ in their own right – reflecting occupational networks and specific shared expertise which create a sense of class belonging and shared class interests (Weeden and Grusky 2005). Intergenerational mobility has been shown to follow microclass lines to a significant extent (Griffiths et al. 2019; Jonsson et al. 2009), but the question of whether microclasses should be interpreted as ‘class’ in a Weberian sense – reflecting economic distinction – remains debated. Microclasses could rather reflect non-economic factors, such as social networks (as suggested by the empirical evaluation in Brooks and Svallfors 2010).

Here I use the Swedish version of the microclass scheme by Jan Jonsson for the period of 2001-2016, which comprises 80 microclasses in Sweden (Jonsson 2009; Jonsson et al. 2009). For the period of 1880-1990, I use a HISCO-based historical version of the microclass scheme which earlier has been applied to a similar historical period for Norway and the US by Dave Griffiths and others (Griffiths et al. 2019). Some microclasses are only defined when I derive microclasses from modern occupational coding, and others only when I derive microclasses from

HISCO.⁴² However, most microclasses are observed over the entire period of 1880-2016 or appear because of actual changes to the composition of the workforce.

I operationalize occupational status using the HISCAM scale, which is the historical counterpart to the modern CAMSIS scale (Lambert et al. 2013; Prandy and Lambert 2003). It is a network-based hierarchical scaling of occupations. Social networks as reflected by marriage certificates are used to define HISCAM. Depending on the frequency at which individuals with certain occupations occur together on the same marriage certificate (e.g. father and son in law), these occupations are defined as socially more or less distant. The HISCAM occupational status scale is generated using marriage certificates over the period of 1800-1938 from seven countries, including Sweden (Lambert et al. 2013).⁴³ In the Swedish data used here, it ranges the values 39-99, with 39 (e.g. housekeeping service) being the lowest and 99 (e.g. professor) being the highest observed status.

Importantly, I use the same occupational status scale across time. This means that I only capture distributional changes in the status distribution, but not any possible changes in the occupational status of specific occupations over time. In practice, the hierarchical ranking of specific occupations on historical and contemporary status scales is rather similar across contexts and time periods (Hout and DiPrete 2006). The distribution of HISCAM values across historical populations is positively skewed both in the contexts for which it was developed, and in the Swedish context studied here; the distance between elite occupations and the rest is large. In similar modern occupational coding (CAMSIS) there is much less of a positive skew (Lambert et al. 2013). But, as I show, HISCAM also doesn't have this skew in modern contexts - suggesting that this is a substantive difference in occupational status between historical and modern contexts, rather than due to methodology.

⁴² Microclasses only derived from HISCO: 'longshoremen and freight handlers', 'gardeners', 'other mechanics', 'electricians', 'foremen'. Microclasses only derived from SSK: 'hospital attendants', 'nursery school teachers and aides', 'insurance agents', 'cashiers', 'truck drivers'. These contain occupations that change microclass when I move from HISCO to SSK occupational coding in the 2000s. The microclass of 'proprietors' disappears after 1990 because this group is not documented in the occupational registers.

⁴³ For both men and women I use the universal version HISCAM scale (version 1.3.1.U2) which is based on *men's* occupations. While there exists a HISCAM scale based on both men's and women's occupations, the U2 version is the "recommended" version and has therefore been applied most frequently in earlier studies. I believe that it is preferable to use the same HISCAM scale for men and women so that men and women with the same occupation are seen as having the same occupational status (for example in marital sorting). The HISCAM scale including social connections regardless of gender (version 1.3.1.U1) is dominated by bride to parent (in law) relationships, as married women are often not registered as occupied except in the Netherlands and Flanders, and not at all in the Swedish HISCAM data (see table 1 in Lambert et al. 2013). In this version proximity between occupations becomes particularly conflated with age and life course, and women are only observed at young ages.

Results

Structural transformation

Participation of men and women

Previous research shows that women's labor force participation follows a U-shaped pattern over economic development (Goldin 1995; Molinder 2021). Figure 2 shows the observed workforce by gender and age. I do not observe this U-shaped pattern but rather increasing participation of women across the period of 1880-2015. This is because own occupations of married women are largely absent from the 1880-1910 censuses, with some specific exceptions (Molinder 2021; Stanfors 2014). In terms of the social structure of Swedish society from 1880-1910, married women's status and class position is generally represented well by their husband rather than their own work – as most non-registered work of married women occurs in family production units. I choose not to impute such occupations but to rather show the social structure of the registered workforce by gender; in this context, work in family production units is fundamentally different from registered women's work, as it is not remunerated, does not reflect labor relationships outside of the household, and does not result in an independent social class or status position for the women performing it.

Figure 2 shows that observed labor force participation in this study is largely in line with figures based on earlier historical work using census data (see Silenstam 1970), and with more recent figures based on workforce surveys (see e.g. Stanfors 2014). The figure shows the share of all observed men and women by age with an occupation in the census and register data at benchmark years.

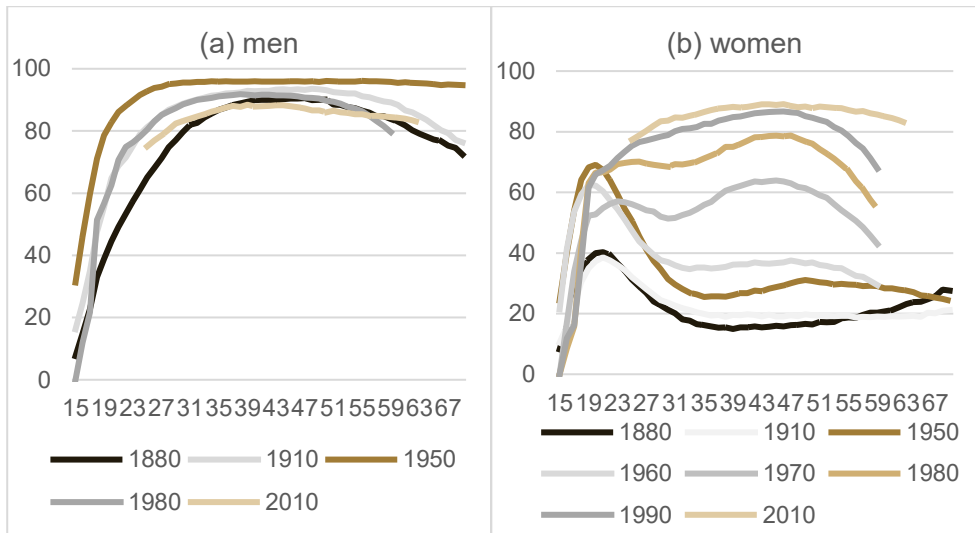


Figure 2 Observed workforce: (a) men and (b) women observed in occupations, as share of the full population aged 15-70. See main text for information on sources and definitions.

Compared to later census years, a large proportion of men was not registered as holding an occupation in 1880 - especially at younger ages. The proportion with registered occupations passed 50% at age 22 and was almost 80% by age 30. The proportion with registered occupations at age 22 increased to 75% by 1910 and 88% by 1950. The increasing registration of men's work at younger ages is likely related to the general formalization of work and disappearance of the family production unit in this period, also essential in the under-registration of women's work. In 1880, proportions of men and women in registered occupations are rather similar up to age 21, when 40% are registered as holding an occupation. They diverge in midlife; around the ages of 40-50 as much as 90% of men are observed as working, but barely 20% of women. Towards the end of working life – and when increasing shares of women are widowed, men and women converge somewhat (to 25% vs. 75%). The proportion of men observed as working is generally high, although comparatively lower in the early (1800s) and late (2000s) period. In recent census and register data, I do not observe cohorts born after 1985, so that I miss occupations at young ages in 2010. Occupations above age 60 are not registered in the 1960-1990 census material, and usually not above age 65 in the 2001-2016 occupational registers.

Among women, I increasingly observe occupations at all ages through the years of 1880-1950. By 1960, other sources suggest that registered occupations of women in

the Swedish censuses cover actual work rather well.⁴⁴ The 1950s are the heyday of the male breadwinner model in Sweden, and observed participation of women after age 30 is rather low, at around 30%. Over 1950-1970, as higher education expands, less women aged 15-23 are observed in occupations. Observed participation after childbearing also increases substantially in this period, from less than one in three, to two in three women working at age 45. Over the period of 1970-1990, women's participation further increases at all ages. By 1990, there is no longer a dip in registered work in childbearing ages. The years since 1990 and during the 2000s labor force participation – as based on censuses and occupational registers – are largely similar for men and women. Actual participation on an everyday basis might still be lower among women than among men, as women take more parental leave and work part-time more often than men (Stanfors 2014).

Thus, my data from 1950 onwards generally corresponds to societal processes of increasing labor force participation among women – first at higher ages and later also while having young children. For the period of 1880-1910, I can mainly study unmarried women's social structure, while that of married women largely resembles the social structure of their husbands. This focus on the part of women's work that is distinct from the family is important to bear in mind when evaluating trends in gender differences over time.

Sectoral change

A defining aspect of industrialization and post-industrialization is sectoral change. Changes in the occupational structure, as divided over primary, secondary and tertiary sectors, are generally used to explain economic development in the historical as well as current development literature (e.g. Brea-Martínez and Pujadas-Mora 2019; Hillbom 2008; Schön 2012). They also form an important component of the changing social structure. I divide HISCO codes over economic sectors to describe sectoral change (cf. Brea-Martínez and Pujadas-Mora 2019) in Sweden from 1880-1990 in figure 3.

⁴⁴ In 1960, I observe 40% of women as working, compared to labor force participation estimates at 43%. In 1950, I observe 35% of women as working compared to participation estimates at 45% (see Molinder 2021).

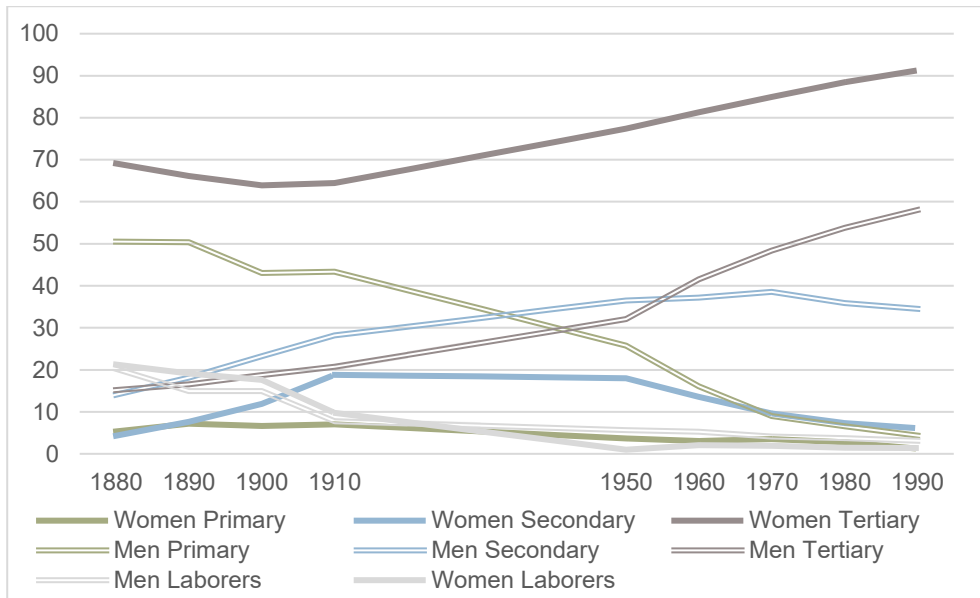


Figure 3: Sectoral change among the Swedish population aged 15-70 through 1880-2015. Laborers without further specification not included in any sector. See main text for information on sources and definitions.

For men, figure 3 shows the typical pattern of sectoral change associated with industrialization and post-industrialization; in the late nineteenth century, most men worked in the primary sector or as general laborers (for whom sector is uncertain). The secondary and tertiary sector grew at the expense of the primary sector over the first half of the twentieth century; by 1950, both employed more men than the primary sector, with the secondary sector being largest. The secondary sector reached its peak around 1970, when four in ten men were employed in that sector. Over the years of 1970-90, the secondary sector again declined, at the expense of the tertiary sector. Meanwhile, the primary sector continued to decline rapidly from 1950-1990, from 25% to 5% of men. The share of men working in the tertiary sector continuously increased over the 1880-1990 period, initially at a slower pace than the secondary sector (1880-1950). Over the years of 1950-1990, the tertiary sector grew rapidly and by 1990 employed nearly 60% of men in the workforce. The vast majority of farmers and farm workers had a relatively low occupational status historically and today (see e.g. Ganzeboom, De Graaf, and Treiman 1992; Lambert et al. 2013). Thus, the decline of the primary sector can be seen as comprising occupational upgrading of the overall workforce.

As discussed, census data does not cover women's work in the primary sector well. Indeed, less than 10% of women were observed as working in the primary sector throughout the period – excluding farmers' wives working in the family production unit (e.g. Nyberg 1994). An additional 20% of women through the 1880-1900 period

are observed as general laborers, including on farms. The sectoral division of women's registered work is ambiguous, especially concerning women working as domestic servants. As these women generally perform service tasks (e.g. housekeeping, laundry services, childcare) and their occupational title does not reveal whether they work in farm or non-farm households, all of them are classified as working in the tertiary sector. The omission of farmers' wives combined with most of women's general labor before industrialization belonging to the tertiary sector (as housekeeping services) results in a very stable sectoral pattern among women. Some of the industrialization process is also observed among women in the workforce; the share of women working in the secondary sector does increase through 1880-1910 and is stable at a relatively high level of 20% from 1910-1950.

The overwhelming majority of women observed as working (80-90%) worked in the tertiary sector or as general laborers across industrialization and post-industrialization. Changes in the social structure of women working can therefore not be linked to sectoral change. What can be linked to sectoral change are increases in the share of women observed as working outside of the family production unit; as the primary sector declines among men, the underreporting of women's work also does.

Specialization

Specialization is generally deemed an important aspect of industrialization. Work tasks of pre-industrial production workers, such as artisans, are rationalized and portioned out over several machines as well as specialized workers. Specialization can be observed in the occupational structure as increasing occupational diversity; as specialization occurs I expect to see a larger number of occupational titles and therefore a larger number of occupational HISCO codes (cf. van Leeuwen 2020). This process is shown for the period of 1880-1950 in figure 4.

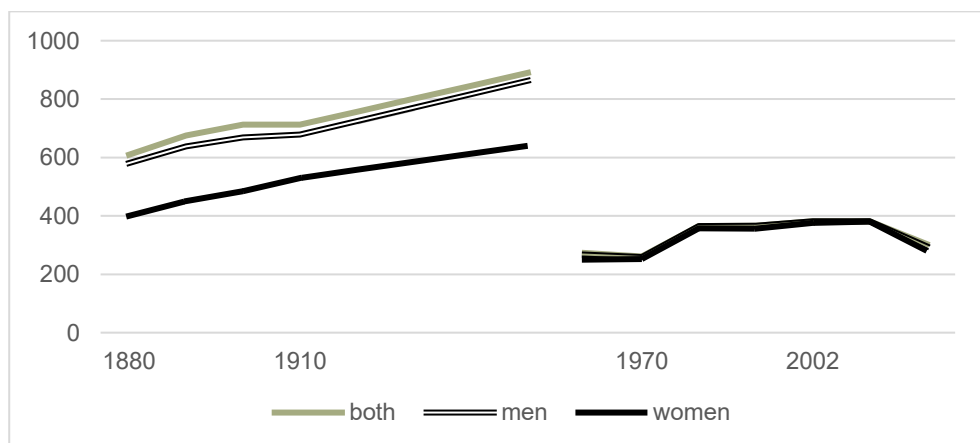


Figure 4: No. of unique HISCO codes observed among the Swedish workforce aged 15-17 through 1880-2015. Source data changes from occupational strings to Swedish codes between 1950 and 1960. See main text for information on sources and definitions.

Figure 4 shows gradual increases in occupational diversity among men and women in the Swedish workforce as industrialization takes place. The observed trend of diversification is the same among men and women, with the number of observed HISCO codes increasing by ca. 250 for each gender. However, observed occupational diversity is consistently higher for men than for women. I observe 640 unique HISCO codes for women, and 860 unique HISCO codes for men in 1950.⁴⁵ Almost all occupations observed among the full workforce are observed among men – the total number of unique HISCO codes in 1950 being 890.

Figure 4 also shows the number of unique HISCO codes over the period of 1960-2015. Not as derived from individual occupational strings, but as derived from contemporary Swedish and Nordic occupational coding. For this period, the number of unique codes no longer reflects actual occupational diversity or specialization processes, as it is based on a rather coarse existing grouping of occupations.⁴⁶ Gender differences in observed occupational diversity disappear from 1960.

Skill levels

Industrialization and post-industrialization are associated with both technological developments, increasing the demand for skilled workers, and educational expansion, increasing the supply of skilled workers. Both of these associations suggest that skill levels should rise and therefore this dimension of the social structure should also change over the course of economic development. Figure 5 shows the distribution of skill levels, based on the class structure, among the workforce of men and women in Sweden from 1880-2015. Additional appendix figures A.1 and A.2 show the distribution of skill levels by age group (figure A.1), and among the Swedish-born subsample of the population (A.2).

⁴⁵ Out of a possible total of 1,675 unique HISCO codes – of which not all are applicable in the 1880-1950 Swedish context.

⁴⁶ From 1960-1990 there are 850 unique Swedish occupational codes (NYK-SEI combinations).

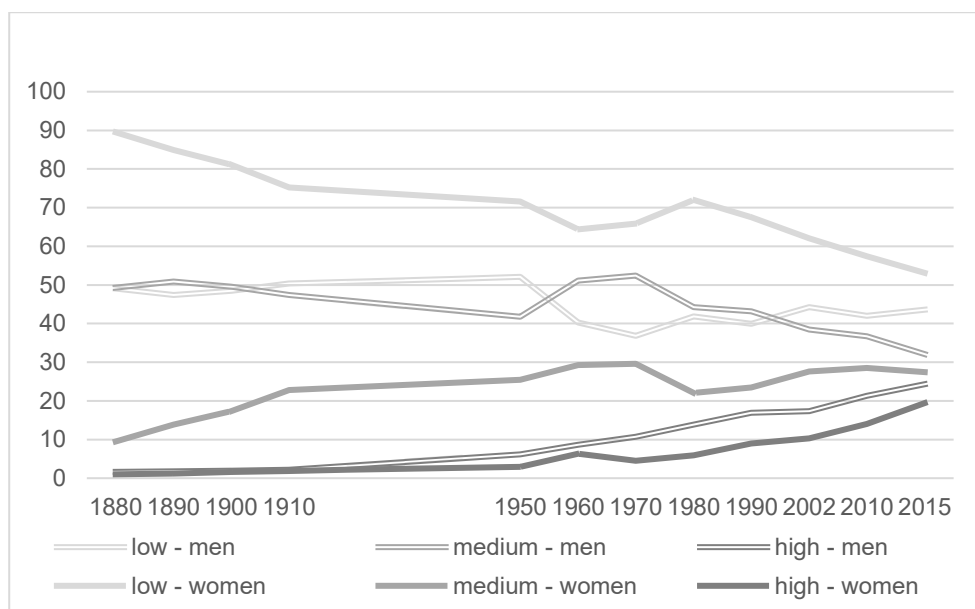


Figure 5: Distribution of skill levels among the full Swedish workforce aged 15-70 through 1880-2015. As based on the skill division made in the HISCLASS classification. See main text for information on sources and definitions. See appendix figure A.2 for the distribution of skill levels among the Swedish-born workforce.

Among men, the share of low- and unskilled workers has remained rather constant at about half of the workforce over this extended period with major socioeconomic, demographic, political and normative changes (cf. Ahrne 1988; Ahrne et al. 2018, using a rather different class scheme). Increases in the share of high-skilled workers thus come entirely at the expense of medium-skilled workers, first at a modest rate during 1880-1950 and then more rapidly since 1970. Less than 2% of working men in the 1880s held high-skilled occupations, while nearly 25% did by 2015. In the meantime, medium-skilled work decreased from ca. 50 to 30%. This, together with stable shares of low-skilled workers, can be seen as polarization of the workforce; occupational upgrading is limited to the half of the social structure in medium- or high-skilled occupations. In terms of the distribution of skill levels, I thus observe polarization, but this should be qualified by sectoral changes; although farmers are seen as medium-skilled, the majority of farmers had low incomes and likely also a low occupational status (e.g. in HISCAM, see Lambert et al. 2013). Thus, polarization in terms of skill levels does not necessarily generalize to polarization in other dimensions.

Among women in the formal workforce, the distribution of skill levels shifts decisively towards higher-skilled workers. The absolute majority of women observed as working in 1880 (90%) is classified as low-skilled. This level drops rapidly until 1910 (to 75%) and then again from 1980-2015 (from 70% to 55%, or

50% among Swedish-born). Both the shares of medium-skilled and high-skilled working women increase over time, with most of the shift being towards medium-skilled before 1970 and to high-skilled after 1970. However, much of the observed increase in skill level before 1980 is related to the changing selection into the formal workforce; historically women below the age of 30 are strongly overrepresented among those observed as working, and this group is more likely to hold low-skilled occupations. Women's labor force participation is rather stable and high over the 1980-2015 period, but despite the stable age structure of working women, I observe clear occupational upgrading across the social structure for women in this period. In contrast to men, no polarization is observed for women.

When selecting workers over the age of 30 only, the share of low-skilled workers is stable over the entire period (see appendix figure A.1). It decreases among those aged 15-30, but mainly decreases in the population as the share of younger workers in the workforce decreases. If I would include farmers' and other wives in family production units as having the same class position as their husbands, then I would see the same transition in terms of skills among women as among men — from predominantly medium-skilled to high-skilled, with rather stable shares of low-skilled from 1880 until 1980.⁴⁷ Appendix figure A.1 further shows that the share of high-skilled workers is generally highest among those aged 30-45 – higher than among those aged 45-70. Increases in skill levels by birth cohort are thus more substantial than increases over the life course. Differences in social structure by age group follow expected patterns and are generally less important for changes in the social structure than differences in the age structure of the workforce.

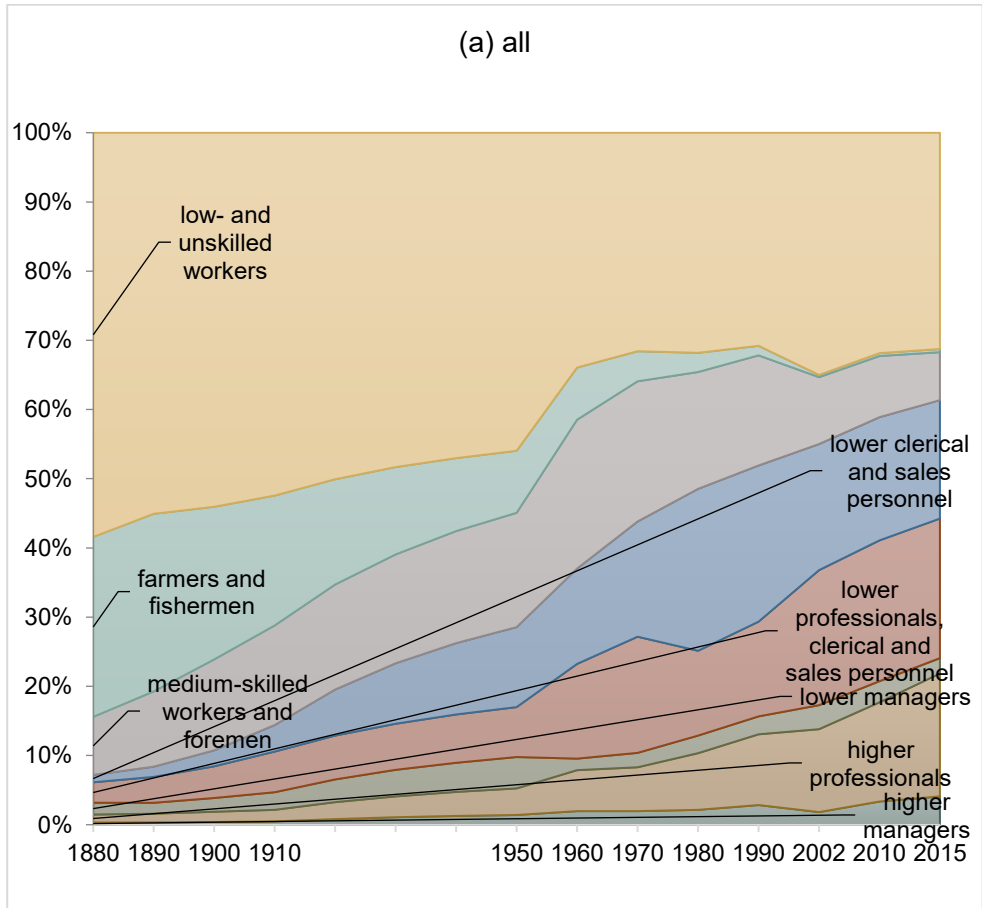
In appendix figure A.2, I show the changing distribution of skill levels among the Swedish-born workforce. The same broad patterns are observed as in the full population, although the shift from medium-skilled to high-skilled with stable levels of low-skilled for men becomes even more apparent; the low-skilled share among Swedish-born men is stable between 1980-2015, but slightly increasing when foreign-born are also included. Among Swedish-born women, a more rapid reduction of low-skilled workers and increase of high-skilled workers is observed over the period of 1980-2015 than in the full population.

Social class of men and women

Changing participation levels of men and women, occupational diversification, sectoral change, and increases in skill level associated with economic development all fundamentally changed the social class structure over the past hundred-fifty

⁴⁷ Based on the class structure of married men being dominated by medium-skilled workers historically, not shown here but figures or descriptive tables available upon request.

years. This change is shown in figure 6 for (a) the full workforce, (b) men, and (c) women.



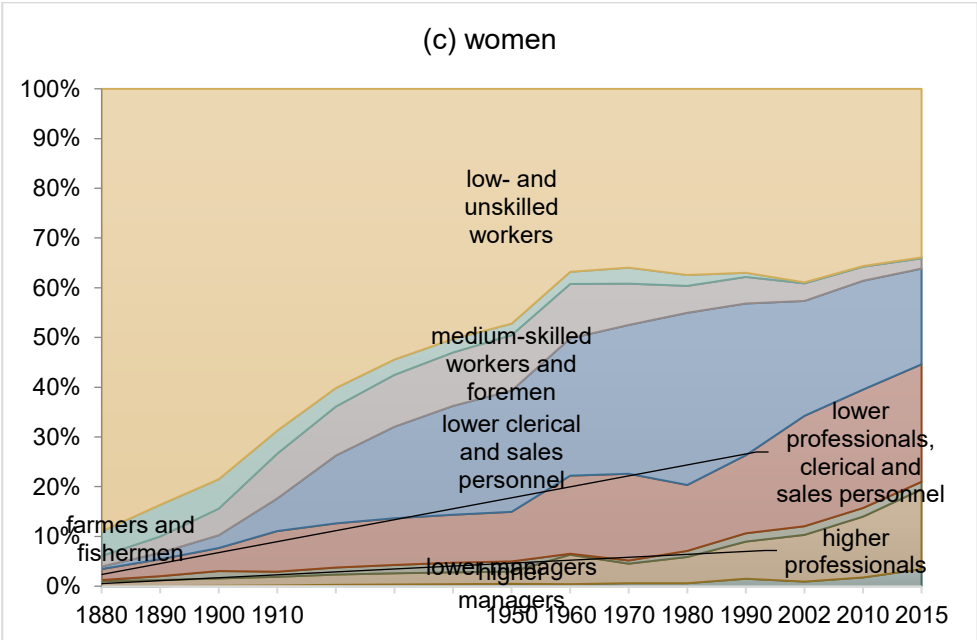
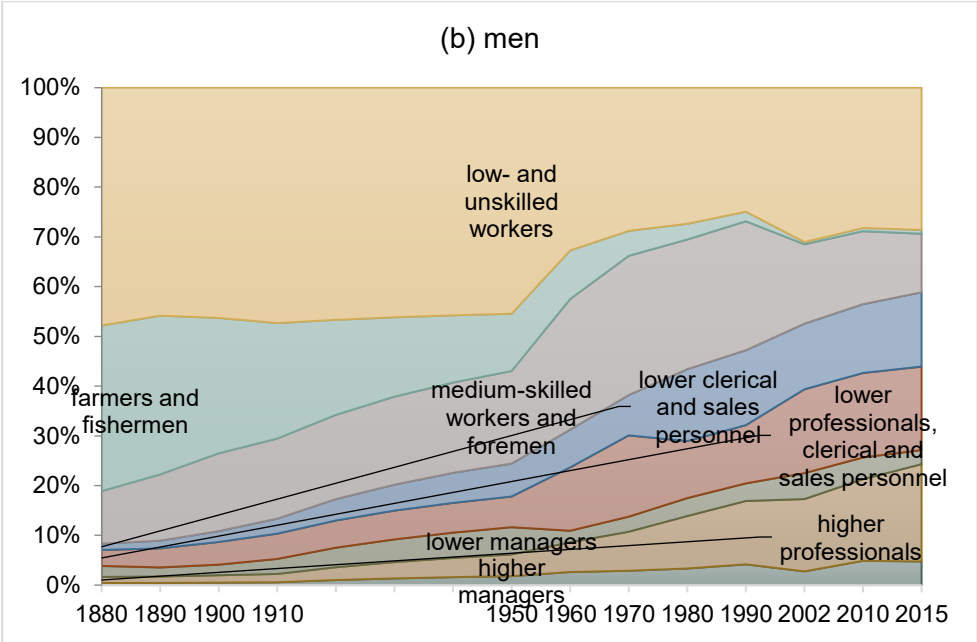


Figure 6: Social stratification as the big class structure (HISCLASS) among (a) the full workforce, (b) men, and (c) women. Swedish population aged 15-70 in 1880-2015. See main text for information on sources and definitions, and appendix figure A.1 for differences compared to a subsample of Swedish-born.

An important dimension of the class structure not described in the previous sections is the manual/non-manual divide. It is in this dimension that the class structure changes most fundamentally in the twentieth century. While less than 10% of the workforce held non-manual occupations up until 1900, over 50% of the workforce held non-manual occupations after 1980. Whereas all non-manual classes are generally seen as reflecting a relatively high position in the social hierarchy of historical societies, this can no longer be the case once more than half of the population belongs to these classes. Thus, the expansion of the non-manual classes is one of the fundamental changes in the class structure of the workforce associated with recent economic development.

Changes in the manual/non-manual divide are fundamentally linked to the changing gender composition of the workforce. Although the share of non-manual workers increases substantially among men as well as women over the twentieth century, this happens earlier for women than for men. Since 1900, working women were overrepresented among the non-manual classes, and as early as in 1960, nearly half of all working women held non-manual class positions, against only 30% of working men. During the early twentieth century the share of working women in non-manual classes thus increased more rapidly than the share of working men, but men caught up during the period of 1960-2000. By the 2000s over half of men as well as women belonged to non-manual classes.

The shift from manual to non-manual is also related to sectoral change; manual occupations are more common in the primary and secondary sector and non-manual occupations in the tertiary sector. However, the sectoral composition of manual and non-manual classes also changes over time. As the primary sector virtually disappears and the tertiary sector grows, both manual and non-manual classes are increasingly composed of occupations in the tertiary sector. Generally, the tertiary sector is larger among non-manual classes and the secondary sector among manual classes. The higher share of women in non-manual classes during much of the twentieth century – and especially in low-skilled non-manual classes – partly reflects sectoral differences between men and women; throughout 1880-2015 most women worked in the tertiary sector.

Polarization in terms of skill level observed among men is also closely tied to the changing manual/non-manual divide. Manual classes with medium-skilled occupations were big in the nineteenth century – encompassing nearly half of all working men. Reductions in these classes happened alongside the slow expansion of high-skilled non-manual classes throughout the twentieth century, but this shift accelerated after 1980. Between 1950-1980 reductions in the class of low- and unskilled manual workers among both men and women occurred simultaneously with an equally large expansion of low-skilled, non-manual classes. This low-skilled, non-manual class was occupied by more than one in three working women by 1980, but only 15% of men. The occupational upgrading in the low-skilled part of the social structure after 1980 that I observe among women, but not men, is linked

to this difference. While the class of low-skilled manual workers is rather stable after 1980, both for men and women, the share of women in the class of low-skilled, non-manual workers decreased substantially over time and converged to the share of men. By 2015, 15% of men and 19% of women belonged to the low-skilled, non-manual class. Thus, on the one hand, women's overrepresentation among low- and unskilled classes decreases over the second half of the twentieth century, but at the same time women's overrepresentation among non-manual classes decreases. Both suggest gender convergence in terms of the social structure, but from seemingly opposite starting points.

In many social stratification schemes, the manual/non-manual divide is seen as a fundamental part of the class structure, but the importance of this division in terms of life outcomes is increasingly debated (see previous sections). I have described the changing distribution of skill levels and industrial sectors among manual and non-manual classes, as well as the growing share of non-manual classes in the full workforce. The substantive manual/non-manual divide observed historically but not today could be linked to these fundamental changes in the composition of manual and non-manual classes.

Studying changes in the class structure makes clear that the observed long-term shift from medium-skilled to high-skilled among men (polarization), is linked to the decline of the primary and growth of the tertiary sector, rather than changes in the secondary sector during much of the twentieth century. After 1970, both the farming and medium-skilled manual classes declined, and after 1990, polarization in terms of skill levels in the class structure was entirely due to reductions in medium-skilled manual work. This is in line with task- or routine-biased technological change; the manual, non-farm classes are composed of low- and unskilled workers performing both routine and relational tasks, and medium-skilled workers performing mainly routine tasks. It is this latter group, and not the former, which becomes smaller during post-industrialization.

I have discussed the manual/non-manual divide among men and women and linked this to two of the other dimensions of the class structure: skill level and economic sector. The HISCLASS scheme further distinguishes classes based on the level of supervision; lower and higher managers are distinguished from lower and higher professionals among the medium- and high-skilled, non-manual workers.⁴⁸ Women are clearly and persistently underrepresented among the managerial classes; their share among these classes is only 10-40% that of men. It increases historically (1880-1910), but remains at the same levels (around 30%) over the following hundred years. Most of the historical underrepresentation of women among

⁴⁸ Among the manual classes, the distinction by level of supervision is blurred in my version of the class scheme as foremen are grouped together with medium-skilled workers; occupational coding of foremen is not sufficiently consistent across sources – and foremen are too rare in a contemporary context – to distinguish them as a separate class.

supervisory classes however goes unnoticed by the under-registration of women's work in family production units; in such families, men generally performed supervisory tasks.

The class structure of men and women converged in many respects over the 1880-2015 period, as men like women were mostly employed in the tertiary sector by the 2000s. The growth of high-skilled classes since 1950 was also rather similar for men and women. The main gender differences persisting into the twenty-first century are the underrepresentation of women in the (medium-)skilled manual class, the overrepresentation of women in the low-skilled, non-manual class, and the overrepresentation of men in managerial classes. Historical gender differences in the class structure, and especially the underrepresentation of women in the farming, medium-skilled and managerial classes, are to a large extent the result of selection of women into formal work; it is exactly among these classes (i.e. farmers, artisans, proprietors) that wives often worked within the family production unit rather than having an independent occupation.

The question of whether the Swedish social structure mostly experienced occupational upgrading or polarization in the long run must be answered differently for different aspects of the social structure. In terms of occupational status, and likely in terms of earnings, industrialization and post-industrialization with the shift away from agriculture and towards non-manual work entail substantial occupational upgrading (see for results on occupational status in the next section, for the link to earnings, Magnusson 2010). In terms of skill levels of social classes, I instead observe polarization among men, but upgrading among women.

Occupational status of men and women

In terms of class-based differences in skill levels, women in the workforce experienced more occupational upgrading than men. But given sectoral changes reflected in the class structure, as well as the growth of the non-manual classes, I expect to see occupational upgrading among both men and women in terms of occupational status. In figure 7, I show the occupational status of men and women at different points in time and across the distribution. Subfigure (a) shows this for men, and subfigure (b) for women. I describe changes over time among the bottom ten percentiles, the upper ten percentiles, and around the middle — at p25, p50 and p75.

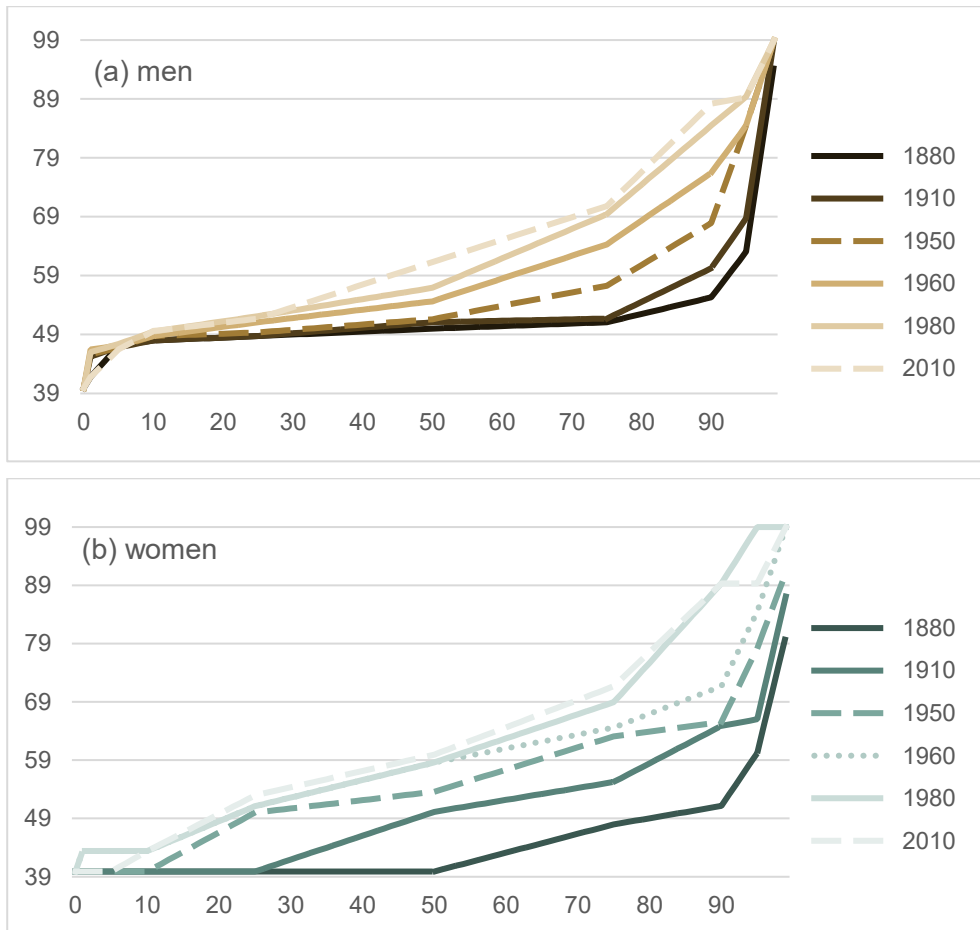


Figure 7: Social stratification as occupational status (HISCAM value) among (a) men, and (b) women in the full Swedish population aged 15-70 in 1880-2015. See main text for information on sources and definitions.

Occupational status of men and women in the bottom of the social structure is rather constant over the full period; among the lowest ten percentiles, men generally have a somewhat higher occupational status than women, with HISCAM values ranging 39-49 for men and 39-43 for women. As there is little variation in occupational titles among these percentiles, this gender difference is the result of a difference in valuation of men’s (*“arbetare/dräng”*) and women’s (*“piga”*) unspecified low- or unskilled work on the HISCAM scale.

Historically, most of the variation in occupational status is found among the upper ten percentiles of the workforce, with men’s HISCAM values ranging 55-99 and women’s ranging 51-80 among these percentiles in 1880. This fundamentally changes as occupational upgrading occurs and a larger share of the workforce

becomes high-skilled over time. By 2010, the HISCAM range covered by the upper ten percentiles is 89-99 for both men and women. The occupational status of working women and men in these upper percentiles converged as early as 1910; in 1910 working women in these percentiles range HISCAM values 65-87, while men range 60-99.

The lower occupational status of working women at p10 together with the higher occupational status of working women at p90 through 1910-2010 is linked to a sharper gradient in occupational status for women than for men across the middle of the social structure historically. For men, p25-p75 range HISCAM values 49-52 in 1880/1910 and 52-71 in 2010. For women, the middle 50 percentiles range HISCAM values 39-55 in 1910 and 53-72 in 2010. For the 1910-1960 period, in which I only observe part of women's work, this does not reflect the disappearance of gender differences in social status generally, but selection into formalized work of certain women. Both women with a high and a low social status appear to have been more likely to engage in formalized work outside of the household than those with average status positions. This sharper gradient in women's than men's observed occupational status gradually disappears over the years of 1950-2010, as women's workforce came to resemble men's workforce in terms of age and participation rate.

During the period of 1880-1910, working women were overrepresented more among the bottom than the top of the social structure, signaled by a lower median status of women than men. This is unsurprising as working women historically were much younger than working men, and occupational status and skill level increased over the life course (see figure 2 and appendix figure A.1). Over the 1950-1980 period, working women instead have a higher median status than men, which is in line with the adoption of the dual-earner family type taking place first among higher status families. By 2010, the hierarchical dimension of the social structure of men and women, as described by the occupational status distribution, looks virtually the same.

Occupational status and social class by gender

Status inequality between social classes

Average occupational status varies substantially by social class, and largely in expected ways, especially at the higher and lower end of the status distribution. This is shown in figure 8 below. Figure 8(a) shows the average occupational status of men in each social class on the x-axis, and the average occupational status of women in each social class on the y-axis. Changes over time in the average occupational status within classes are shown both for men and women with colored lines.

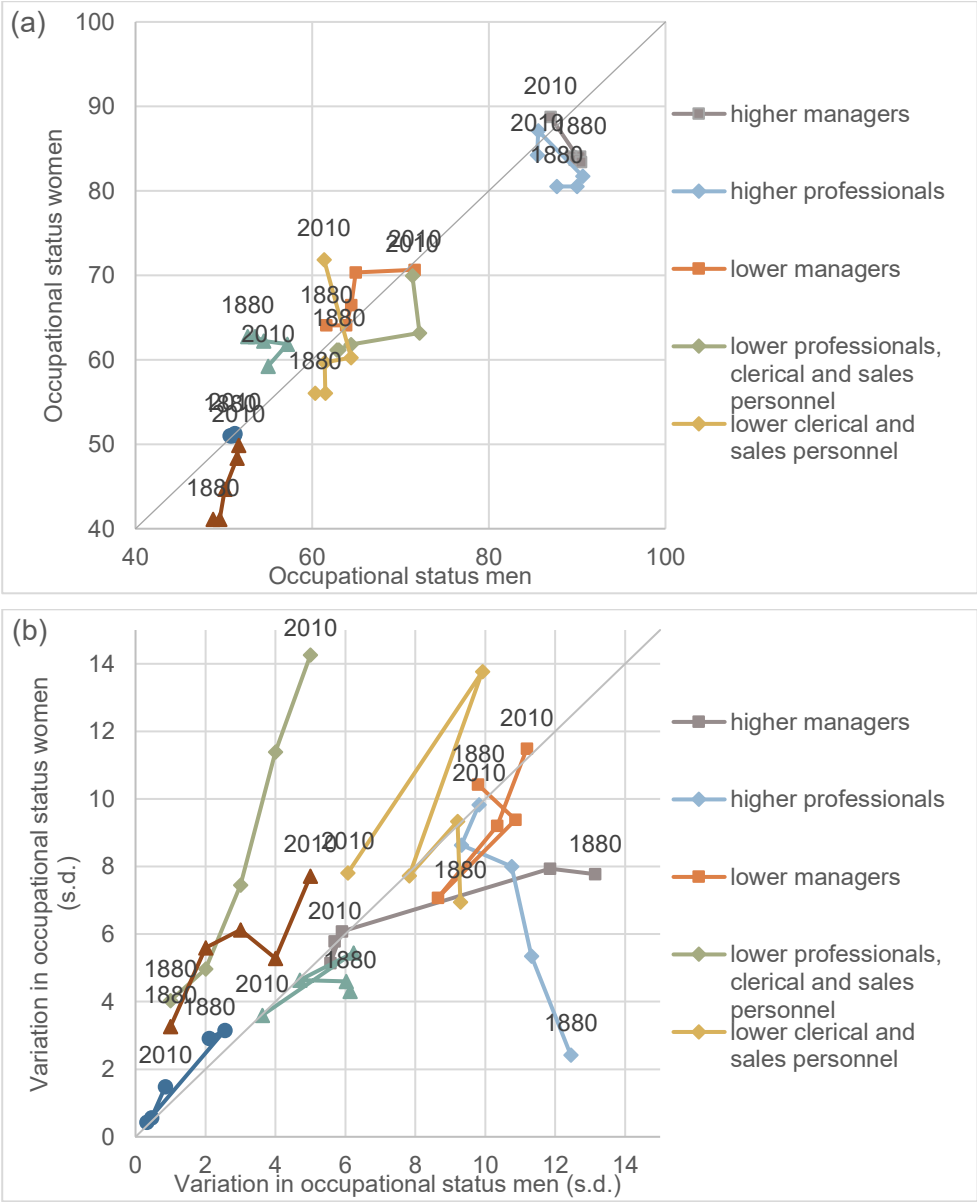


Figure 8: Occupational status (HISCAM) within social classes (HISCLASS) by gender, among women on the y-axis and among men on the x-axis. Subfigure (a) shows the average occupational status in each social class by gender as it changes over time (in benchmark years 1880, 1910, 1950, 1980 and 2010). Subfigure (b) shows the standard deviation of occupational status within each social class by gender as it changes over time (1880-2010 as before), among the full Swedish population aged 15-70 in 1880-2015. See main text for information on sources and definitions.

The average occupational status of higher managerial and professional classes ranges HISCAM values 80-91, the status of lower managerial and professional classes ranges HISCAM values 61-73, the status of farmers is stable around HISCAM value 51, and that of low- and unskilled workers ranges 41-52. Thus, there is a clear hierarchical ranking from low- and unskilled workers and farmers, to lower managerial and professional classes, to higher managerial and professional classes. There are substantial differences in occupational status between these classes across the period of 1880-2010. Hierarchical differences between managerial and professional classes at the same skill level are not consistent over time and between genders, so that these can better be grouped together if social classes are interpreted to represent a status hierarchy.

Within the higher managerial and professional classes, men historically had a higher average occupational status than women. This difference is rather persistent across the twentieth century, but disappears during the second half of the twentieth century. Over time, the average occupational status of these two classes decreases somewhat for men, while it increases somewhat for women. A similar pattern is visible at the low end of the status distribution; the average occupational status of women in the low- and unskilled working class is substantially lower than among men historically, and this difference disappears over the second half of the twentieth century as the occupational status of women within this class increases substantially. By the 2000s men and women in the low- and unskilled working class had approximately the same occupational status. The average occupational status of men and women is rather similar among the lower managerial and professional classes already historically and increases substantially for both men and women over the second half of the twentieth century (from ca. 63 to just over 70).

Overall, I see differences by gender and between classes in occupational status trends over time. Status increases within classes are largest among women at the top and bottom (low-skilled and high-skilled), and among both men and women in the lower managerial and professional classes. Generally, occupational status within classes is rather stable for men but increases substantially among some of the numerous classes for women. As the occupational status assigned to each individual occupation does not change over time in my operationalization, this implies that women hold higher-status occupations within each of these classes in the twenty-first century than historically, while the within-class status distribution is rather stable for men.

So far, I have excluded the mid-range classes of lower clerical and sales personnel and medium-skilled workers and foremen from this discussion. This is because the occupational status of middle status groups around the manual/non-manual divide differs by gender, and this difference changes over time. Among men, skilled manual workers and foremen consistently have a lower occupational status than lower clerical and sales personnel, suggesting that non-manual is valued more than skill level on the HISCAM scale. Among men, both classes are also relatively stable

in terms of average occupational status over time, with skilled manual ranging HISCAM values 53-57, and lower clerical and sales personnel ranging HISCAM values 61-64. The occupational status of these classes among women is however rather different, and from 1880 until 1980, women in the medium-skilled and foremen class had a clearly higher HISCAM status (62-63) than both men in the same social class and women in the lower clerical and sales class (56-60). By the 2010s I no longer see these contrasting patterns, by then the occupational status of lower clerical and sales personnel was higher than the status of skilled manual workers among both men and women.

These two classes in the middle of the social structure thus represent different occupations with a different position in the occupational status hierarchy for men than they do for women. This suggests that a hierarchical ranking of these two classes should be avoided, especially when class positions of both men and women are studied. If social classes are interpreted as reflecting a hierarchical ranking, the class of lower clerical and sales personnel could be combined with that of medium-skilled workers and foremen.

Status inequality within social classes

Figure 8(b) shows the standard deviation of occupational status, as measured by HISCAM values, within social classes over time and by gender. Social classes towards the left and bottom of the figure have relatively little within-class variation in occupational status, indicating that they represent a relatively homogenous social class. Social classes towards the right and top of the figure have high within-class variation in occupational status, indicating that the hierarchical position of different individuals in these classes can differ substantially. HISCAM values are not normally distributed, but standard deviations above 12 should be considered as very high. In classes with such deviations, occupational status likely ranges much of the entire 39-99 span covered in the Swedish context, or the occupational status of members of these classes is divided between two very distinct groups.

I observe such high within-class status inequality within the social classes of lower professionals and clerical and sales personnel among women from 1980-2010, and from 1880-1910 within the higher managerial and professional classes among men. Within-class status variation is generally high for both men and women in the lower non-manual classes. The occupational status of individuals holding different occupations within these classes could thus differ quite substantially on the HISCAM scale. Of these classes, the lower professional class has least within-class status variation, especially among men. Within-class status variation is highest among women in the lower non-manual classes in recent years (1980-2010).

Within-class status variation is generally higher among women than among men, except for the higher managerial and professional classes historically. High within-class status variation among men in high status classes does not reflect ambiguous

class categories, but should be expected, as most of the variation in HISCAM values in these years reflects only the highest ten percentiles of the status distribution (as shown in figure 7). Higher within-class status variation among women than among men is seen both in the lower non-manual classes, but also in the class of low- and unskilled workers. This suggest that the social class categories used here (HISCLASS) reflect class boundaries, i.e. meaningful distinctions in social space, better for men than for women.

The within-class status variation in the manual classes of medium-skilled workers and foremen, farmers and fishermen, and (especially among men) low- and unskilled workers is generally lower than the within-class status variation in non-manual classes. Generally, the manual classes thus are more homogeneous in terms of occupational status than the non-manual classes.

Microclass of men and women

In the middle of the occupational structure, in the low-skilled, non-manual and medium-skilled, manual classes, the line between low-skilled and medium-skilled is sometimes difficult to draw, and in terms of status needs to be weighed against the manual/non-manual divide. Men more often hold manual class positions, and women more often hold non-manual class positions. Comparing men and women to each other in either of these classes would reflect different parts and shares of the social structure of men and women. To compare the work of men and women over time, I therefore choose to focus on low- and high-status positions in the social structure. Higher professional classes are relatively less segregated along gender lines and have more formalized skill requirements that make a comparison of men and women less ambiguous. They form the ‘high end’ of the social structure both in terms of occupational prestige, skill requirement, and the manual/non-manual divide – although not in terms of supervisory tasks dominated by men. Low- and unskilled manual workers can be seen as the low end of the social structure in terms of all these dimensions. In the following section, I compare men’s and women’s microclass positions in these two social classes.

Microclass composition of social classes

The social class of low- and unskilled workers contains a very large share of the workforce; half of all workers historically and one in three in 1960-2015. By showing the microclass composition of this social class, I clarify which different occupational specializations or networks this class reflects, and how this differs by gender. The five largest microclasses in this broad social class, excluding general laborers, are shown in table 1 below. The table shows this both for the full workforce, among men, and among women.

Table 1: Microclass composition of the class of unskilled and low-skilled manual workers (HISCLASS 9-12), excluding general laborers; five most common microclasses and their respective share by gender, among the Swedish workforce aged 15-70. Historical microclasses based on HISCO as in Griffiths et al. 2018 in 1880-1990, contemporary microclasses based on ISCO-88 cf. Jonsson 2009. Historical labels, see asterix and notes below for classes where labels differ substantially. See main text for other information on sources and definitions.

	Microclass	1880	Microclass	1910	Microclass	1950	Microclass	1980	Microclass	2010
Total										
	Housekeeping workers	43.11	Farm laborers	24.92	Farm laborers	14.00	Service workers, n.e.c.	16.61	Housekeeping workers	25.55
	Farm laborers	29.47	Housekeeping workers	19.47	Housekeeping workers	8.55	Launderers and dry-cleaners	9.50	Hospital attendants	18.57
	Operatives and kindred workers, n.e.c.	6.03	Operatives and kindred workers, n.e.c.	5.06	Mass transportation operators	6.90	Mass transportation operators	9.31	Nursery school teachers and aides	7.35
	Members of armed forces	6.03	Tailors and related workers	5.04	Longshoremen and freight handlers	5.80	Longshoremen and freight handlers	7.42	Health semiprofessionals	5.29
	Tailors and related workers	2.11	Forestry workers	3.96	Tailors and related workers	5.63	Housekeeping workers	6.80	Truck drivers	4.42
		86.75		58.45		40.88		49.64		61.18
Men										
	Farm laborers	54.54	Farm laborers	34.65	Farm laborers	19.75	Mass transportation operators	18.75	Housekeeping workers	11.71
	Operatives and kindred workers, n.e.c.	11.17	Operatives and kindred workers, n.e.c.	7.34	Mass transportation operators	9.90	Longshoremen and freight handlers	11.49	Truck drivers	9.93
	Members of armed forces	11.08	Forestry workers	5.79	Forestry workers	7.52	Chemical processors	6.23	Metal processors	8.94
	Fishermen	2.78	Miners and related workers	4.64	Longshoremen and freight handlers	7.49	Welders and related metal workers	6.19	Mass transportation operators	7.67
	Painters	2.01	Sawyers and lumber inspectors	4.43	carpenters, and related construction workers	5.40	Painters	5.42	carpenters, Bricklayers, and related construction workers	7.62
		81.58		56.86		50.06		48.08		45.87
Women										
	Housekeeping workers	92.50	Housekeeping workers	60.27	Housekeeping workers	27.80	Service workers, n.e.c.	29.13	Housekeeping workers	36.08
	Tailors and related workers	3.64	Tailors and related workers	14.96	Tailors and related workers	16.50	Launderers and dry-cleaners	15.29	Hospital attendants	28.89
	Launderers and dry-cleaners	1.61	Launderers and dry-cleaners	6.33	Launderers and dry-cleaners	9.91	Housekeeping workers	12.37	Nursery school teachers and aides	11.69
	Textile workers	0.49	Textile workers	6.28	Food service workers	9.77	Food service workers	10.39	Health semiprofessionals	8.47
	Food processors	0.48	Farm laborers	3.85	Textile workers	7.32	Health semiprofessionals	9.27	Food service workers	1.68
		98.71		91.69		71.30		76.44		86.82

The average occupational status in this class was lower among women than among men historically, but became similar over time. Within-class status variation is higher among women than among men, although rather low among both genders historically (see figure 8). Historically, within-class status variation among women is entirely driven by the large gap between housekeeping workers and all other occupations in terms of HISCAM; this is the microclass in which the majority of women in the low- and unskilled worker class were occupied. Across the period of 1880-1950, and again in the 2000s, housekeeping work was the most common microclass for women and the total low- and unskilled workforce, except for a clear dip in 1980. The size of the housekeeping microclass does not appear to be associated with industrialization or post-industrialization processes, although it was smaller in the heyday of the welfare state (1980).

Early industrialization is clearly reflected in the changing class composition among men from 1880 to 1910; the paper, wood and mining industries were large in Swedish industrialization, and workers in these industries also came to dominate the low- and unskilled manual class. In 1880, it was still dominated by non-industrial microclasses: farm laborers, members of the armed forces, fishermen and painters. Microclasses associated with industrial development and improvements in transport and communications continued to dominate this class for men in 1950 and 1980.⁴⁹ To some extent, this was still the case in 2010, but by then non-routine, or less routine, microclasses in housekeeping and transport had come to dominate the low- and unskilled non-manual class for men. This means that men's and women's work in the low- and unskilled non-manual class has become more similar in recent times – especially through the entry of men into housekeeping work.

The low- and unskilled class becomes more diverse over time, especially for men; less than half of all workers were occupied in one of the top five microclasses after 1950. Diversity in terms of microclasses is smaller among women, here the low- and unskilled class is always dominated by various service workers. Low- and unskilled service work becomes more specialized over time; most of this is classified as general housekeeping work historically, but since 1980 it is divided over healthcare, childcare, food service, housekeeping, and other service microclasses. The dominance of service work was sufficiently strong in 1980 and especially 2010 for these microclasses to also dominate the combined workforce of men and women, which had previously been dominated by farm workers.

At the high-status and high-skilled end of the social structure, most men and women belong to the class of higher professionals (see figure 6 and 8(a)). The occupational status of women in this class was lower than that of men historically but became

⁴⁹ With, for example, the microclasses of “mass transportation operators”, “longshoremen and freight handlers”, “chemical processors” and “welders”.

similar over time. This is also one of the social classes in which within-class variation in occupational status is relatively high, for both genders today and for men historically (figure 8(b)). I show the microclass composition of this social class to clarify which – if any – microclass differences this high within-class status variation derives from, and what the gender differences in average status are based on historically. This is shown in table 2, which is comparable to table 1 and shows the five largest microclasses among men and women in this broad social class.

Table 2: Microclass composition of the class of higher professionals (HISCLASS 2): five most common microclasses and their respective share by gender, among the Swedish workforce aged 15-70. Historical microclasses based on HISCO as in Griffiths et al. 2018 in 1880-1990, contemporary microclasses based on ISCO-88 cf. Jonsson 2009. Historical labels, see asterix and notes below for classes where labels differ substantially. See main text for other information on sources and definitions.

	Microclass 1880	Microclass 1910	Microclass 1950	Microclass 1980	Microclass 2010
Total					
Elementary & secondary school teachers	44.44	Elementary & secondary school teachers	39.96	Elementary & secondary school teachers	Systems analysts and programmers
Workers in religion	21.65	Engineers	14.86	Engineers	Elementary & secondary school teachers
Health professionals	8.80	Workers in religion	9.78	Health professionals	Commercial Managers
Engineers	7.72	Health professionals	9.71	Journalists, authors, and related writers	Engineers
Jurists	7.21	Jurists	7.88	Statistical and social scientists	Health professionals
	89.82	84.14	82.18	74.01	62.11
Men					
Elementary & secondary school teachers	29.07	Engineers	47.86	Engineers	Systems analysts & programmers
Workers in religion	27.55	Workers in religion	11.41	Elementary & secondary school teachers	Engineers
Health professionals	11.26	Health professionals	8.52	Health professionals	Commercial Managers
Engineers	9.90	Elementary & secondary school teachers	7.02	Journalists, authors, and related writers	Elementary & secondary school teachers
Jurists	9.25	Jurists	6.20	Statistical & social scientists	Health professionals
	87.03	79.64	81.02	71.40	67.01
Women					
Elementary & secondary school teachers	98.63	Elementary & secondary school teachers	52.46	Elementary & secondary school teachers	Elementary & secondary school teachers
Workers in religion	0.83	Health professionals	19.57	Health professionals	Commercial Managers
Health professionals	0.15	Workers in religion	15.35	Statistical & social scientists	Health professionals
Accountants	0.15	Journalists, authors, and related writers	4.67	Journalists, authors, and related writers	Systems analysts & programmers
Journalists, authors, and related writers	0.09	Accountants	2.10	Librarians	Professors & instructors
	99.85	99.30	94.15	83.06	57.14

The higher occupational status of higher professional men than women historically reflects a lower occupational status (in terms of HISCAM) for teachers than for other common higher professional occupations at the time (priests, doctors, engineers, and lawyers). Historically almost all women in the class of higher professionals were teachers. Although this dominance is reduced substantially over time, the teacher microclass is always the biggest microclass among higher professional women. This dominance of teachers explains low within-class status variation among women historically. Increasingly, the higher professional class among women is composed of health professionals – who formed part of the five most common microclasses throughout 1880-2015. The microclass of “journalists, authors, and related writers” was among the five most common between 1880-1980, but disappeared in the 2000s. Similarly, workers in religion formed a growing share of higher professional women over the period of 1880-1950, but disappeared after 1950. By 1950, the class had become rather diverse among women.

In 1980 and 2010, the most common microclasses reflected recent technological developments, with the appearance of “statistical and social scientists” and “systems analysts and programmers” as some of the most common higher professional occupations among women as well as men. System analysts and programmers even replaced engineers as the most common higher professional microclass for men in 2010. Before 1980, technological development was reflected in the increasing share of engineers among higher professional men. In 1880, when industrialization had not yet taken off in full, teachers, workers in religion, and health professionals had all been more common microclasses among men than engineers. But in 1910, 1950 and 1980, engineers dominated the class among men. Teachers consistently form an important part of the higher professional class for men, as they do for women. Among men, journalism was somewhat less important than among women in the same class, only appearing in the top five in 1980. The share of health professionals, another big microclass both among men and women, was rather stable among men and higher than among women historically but decreased in the 2000s. During the second half of the twentieth century this microclass shifted from being dominated by men to being dominated by women.

Gender overlap in the microclass structure

Gender overlap in the microclass structure reflects horizontal as well as vertical (dis)similarities in the social structure by gender. Figure 9 shows the total overlap in terms of microclasses between the social structure of men and women, as the share covered by the stacked area graph (using historical microclasses as in Griffiths et al., 2019; Jonsson, 2009). The full distribution of men and women across microclasses is shown in appendix table A.1. Figure 9 shows that gender overlap in terms of microclasses increased over time; it doubled from 18 to 36% over the years 1880-1910, then decreased until 1950, and again doubled from ca. 27% in 1950 to

over half in 2015. Thus, for half of all working men in 2015, one can find a woman working in the same microclass.

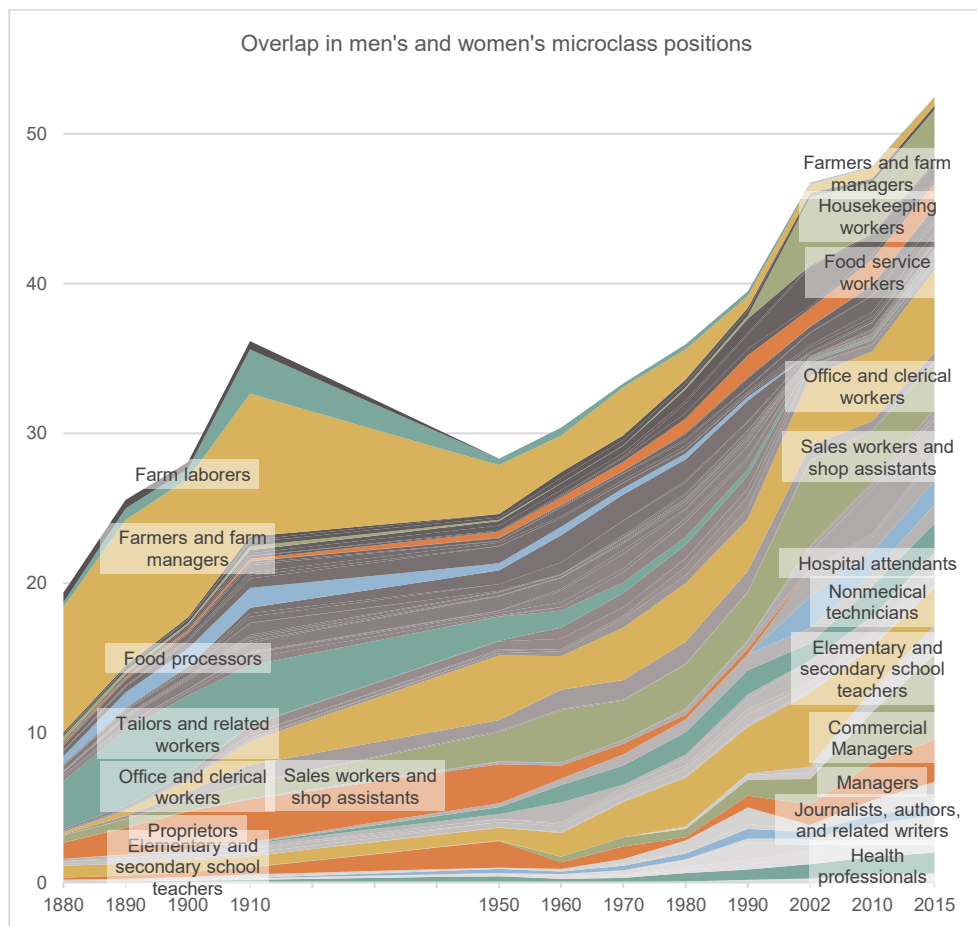


Figure 9: Gender overlap in microclasses. Reflecting increasing microclass similarity in the social structure of working men and women (total share), and highlighting historical and contemporary microclasses where much of the overlap occurs. Historical microclasses based on HISCO as in Griffiths et al. 2018 in 1880-1990, contemporary microclasses based on ISCO-88 cf. Jonsson 2009. Historical labels, see asterixis and notes below for classes where labels differ substantially. See main text for other information on sources and definitions.

Each stack in figure 9 reflects the overlapping share within a given microclass, i.e. the minimum of the share of men and the share of women in that microclass. Large stacks thus reflect microclasses in which both a substantial share of men and women work. Some of the microclasses in which relatively many men and women worked are labeled historically (around 1900) and recently (2000s), to reflect where in the social structure men and women meet in the same kind of occupational networks.

The figure shows that historically, farming was the biggest microclass in which both men and women worked, this despite the work of farmers' wives generally not being recorded. The second biggest microclass overlap historically was among tailors (and other textile workers), followed by proprietors.⁵⁰ Other microclasses in which substantial shares of both men and women worked were farm laborers, food processors (and other food-related microclasses), elementary and secondary school teachers, and broad microclasses for clerical and sales personnel. The microclasses with high gender overlap historically formed a mix of 'typical' microclasses for women, such as textile workers, clerical and sales personnel, and teachers, combined with the most common microclasses among men (e.g. farmers, proprietors, see appendix table A.1).

Many of the historical microclasses with high gender overlap continued to shape an important part of gender overlap in the 2000s: farmers, food-related workers, clerical and sales personnel, and teachers. Virtually all of the microclasses in which both large shares of men and women worked in the 2000s, but not historically, were based on relational work tasks, i.e. those tasks which do not disappear during routine-biased technological change (with the exception of non-medical technicians).⁵¹ By the 2000s the majority of both men and women in the Swedish workforce performed such relational (non-routine) work tasks which traditionally had been dominated by women (see e.g. Magnusson and Tåhlin 2018).

⁵⁰ Many of the women in the farming and proprietor microclasses were widows – a group for which occupational information generally was recorded more completely than among married women (cf. Molinder 2021).

⁵¹ These are housekeeping workers, hospital attendants, (commercial) managers, journalists, health professionals (as highlighted), but also general service workers, nursery school teachers, health semiprofessionals, social and welfare workers, government officials, and professors and instructors.

Concluding discussion

Major structural transformations experienced by Sweden and other countries over the course of the last centuries were associated with fundamental changes in the social structure of society. This study shows long-term patterns of occupational upgrading following economic, institutional, and educational development. Society transitioned from a dichotomous social structure, perhaps best described as bourgeoisie and proletariat, to a more gradational social structure, perhaps best described using microclasses or occupational status. Although a Weberian big class scheme (here: HISCLASS) consistently reflects meaningful social boundaries, especially for men, it abstracts from this decisive change in the social structure.

Across most of the 1880-2016 period social stratification measures are better suited to capture men's than women's social hierarchies and boundaries. However, by the twenty-first century the social structure of men has largely converged to that of women – with most of the workforce divided across low-skilled and non-manual classes in the service sector. In this social structure, traditional class schemes such as HISCLASS mainly reflect differences in skill levels. Other relevant social boundaries and hierarchies among women generally, and men in the twenty-first century, are perhaps better captured by microclasses, occupational status, or modern class schemes

With the expansion of human capital and technological change, the share of high-skilled workers increased sharply in Sweden; from less than 2% of the workforce in the late nineteenth century, to over 20% of the workforce in the early decades of the twenty-first century. Together with this increase in the share of high-skilled workers, the average occupational status of working men and women increased substantially, and most workers came to belong to the non-manual classes. The general story of the social structure during industrialization and post-industrialization is one of occupational upgrading; also the transition from work in the primary to secondary to tertiary sector is generally seen as occupational upgrading, associated with increased earnings and higher occupational status. The same holds for the transition from the manual to non-manual classes, and increases in human capital among the workforce.

Looking at the distribution of skill levels, the expansion of high-skilled work largely came at the expense of medium-skilled work rather than low- and unskilled work. Although skill levels of women in the formal workforce increased across the social structure, they did not do so for men or women in family production units.⁵² Skill-biased technological change during industrialization thus mostly affected the upper half of the social structure. The social structure transitioned from being dominated

⁵² Women in family production units were overrepresented among medium-skilled workers (e.g. farmers, artisans, proprietors).

by skills acquired through on-the-job training, such as those of pre-industrial farmers or artisans, to skills acquired in the expanding educational system. The latter are required in many of the expanding high-skilled and non-manual jobs of the twentieth and twenty-first century.

As occupational upgrading of the workforce happened, variation in occupational status increased substantially. Variation increased both across the social structure, and within certain social classes. The occupational hierarchy of society in the nineteenth century was clear; there was a small high-status elite, a large majority of low status workers (and farmers), and rather few occupational positions in-between these extremes. Increases in human capital together with the process of specialization led to increasing occupational diversity and increasing diversity in occupational status. By the twenty-first century the occupational hierarchy has become gradational, with the vast majority of the workforce holding occupational positions between the two extremes of the nineteenth century. This has led some to conclude that class, as a relevant theoretical concept describing social inequalities, has become redundant (Crompton 2008; Pakulski and Waters 1996).

By studying within-class and between-class inequality in occupational status, I show that social classes still represent meaningful hierarchical boundaries in social space in Sweden today, especially for men and at the high and low end of the social structure. Moreover, abstracting from the non-hierarchical boundaries distinguished in social class approaches, such as economic sector or degree of supervision and to some extent the manual/non-manual divide, obscures from important structural differences between contexts – both in terms of gender as in terms of time period or location.

Routine-biased technological change from the late twentieth century is associated with polarization among men, but occupational upgrading among women. As women rarely work in the routine occupations declining during routine-biased technological change, their occupational structure is rather unaffected by this transition. Other structural transformations associated with post-industrialization, notably the growth of care work associated with population ageing, are more relevant for the social structure of women – for whom care-related microclasses grow over time (see for other contexts e.g. Oesch 2015).

For men, the effect of routine-biased technological change on the social structure is complex. Men experienced occupational upgrading in terms of occupational status, as the growing non-manual classes had a higher occupational status than manual classes. On the other hand, they experienced polarization in terms of skill level and class structure, with increases in both high- and low-skilled classes. They also seemed to experience polarization in terms of earnings (e.g. Adermon and Gustavsson 2015; but see Oesch and Piccitto 2019); some previously female-dominated work – into which men transitioned during routine-biased technological change – generally has higher occupational status but lower earnings than male-

dominated work in Sweden (Magnusson 2009). Routine-biased technological change is associated with gender convergence in the social structure. Men moved into non-routine, traditionally female-dominated occupations as routine occupations became less prevalent (cf. microclass results).

In several ways, the changing social structure of men during post-industrialization is not new but mirrors the changing social structure of men during industrialization; in both phases the size of medium-skilled classes was reduced and that of low- as well as high-skilled classes increased – first outside of farming and later outside of routine work in the industrial sector.

Different stratification measures are useful to highlight different components of the social structure. In general, I find that the stratification measures evaluated (especially HISCLASS and HISCAM) are more consistent and informative (in terms of explaining each other) for men than for women. Some of the main components of the social class structure such as economic sector and the manual/non-manual divide describe meaningful social boundaries for men but not so much for women. There is generally more within-class variation among women than men in terms of occupational status, and the occupational status of some social classes is less consistent over time among women than among men. This is in line with earlier work suggesting that social class schemes are often better suited to describe social stratification among men than among women (e.g. Sorensen 1994).

I described the average occupational status and variation therein among men and women within each social class, and how these changed over time. This shows which social classes can be distinguished hierarchically in a consistent way both over the long term and between genders. There is a clear and consistent hierarchical division between higher professional and managerial classes and all other classes. Low- and unskilled working classes together with farmers consistently have a lower occupational status than all other classes, for both men and women and over time. The difference between higher professional and higher managerial, or between low- and unskilled working class and farming, is meaningful in other dimensions, but not clear in terms of occupational status.

The two social classes around the manual/non-manual divide require caution when used to describe hierarchical differences over the long term or across gender. There are substantial gender differences in the relative position of the medium-skilled manual class on the one hand, and the low-skilled non-manual class on the other hand. When studying both men and women, these two classes cannot be ranked hierarchically in a consistent way. For women, their occupational status is rather like that of lower professional and managerial classes historically. For men, the manual class has a distinctly lower occupational status than these three lower non-manual classes. For both women and men, a gap arises between the ambiguous medium-skilled manual and low-skilled non-manual classes on the one hand, and

the lower professional and managerial classes on the other hand. The latter have a distinct higher occupational status in recent decades.

Microclasses form a useful tool in the study of routine-biased and other task-specific changes in the social structure. They also form a useful tool to compare the social structure of men and women; both historically and today, men and women often hold different microclass positions within the same social classes, revealing ‘horizontal’ gender differences in the social structure. However, the overall gender overlap in terms of microclasses increased substantially over time – from 20% in the nineteenth century to over 50% by the 2000s. This increasing gender overlap is due to the decline of male-dominated microclasses, with especially routine and other industrial occupations, over time. Both at the high and low end of the social structure, men increasingly hold the same microclass positions commonly occupied by women in earlier decades.

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Appendix

Creating a uniform occupational coding across time

In the 1880, 1890, 1900, 1910 and 1950 censuses, occupational information is recorded as occupational strings which have been coded into the historical occupational coding scheme HISCO (Leeuwen et al. 2002). This is done within the Swedpop project (www.swedpop.se). The Swedish censuses in 1960-1990 contain occupational codes based on the Swedish NYK-78 and NYK-83 codings, and a variable indicating socioeconomic status (SEI) (Statistics Sweden 1982, 1989b). These codes can be translated to occupational codings used in the occupational registers (Bihagen 2007). However, I use a new translation key created here which links each NYK-78 + SEI combination to a HISCO code. This translation key is available upon request for anyone who would like to use it, in the form of a conversion table between NYK-78 + SEI combinations and HISCO code.

This translation key is created using a two-step matching of HISCO codes to 850 unique NYK-SEI combinations (Statistics Sweden 1989a). Firstly, automated matching of a list of occupational strings for each SEI-NYK combination to 1880-1950 occupational strings and their HISCO is performed. Secondly, SEI-NYK combinations are coded manually to HISCO using the theoretical framework presented by van Leeuwen et al (Leeuwen et al. 2002) and information on individual occupations within SEI-NYK combinations as derived in step one.

This HISCO occupational coding for 1960-1990 distinguishes different dimensions of occupational differences (product, authority, ownership, skill and expertise). In comparison with the existing Bihagen NYK to SSK key (Bihagen 2007), this conversion places stronger emphasis on hierarchical differences and differences in skill level and facilitates a direct assignment of social class or occupational status measures designed for long time periods such as microclasses, HISCAM and HISCLASS (Griffiths et al. 2019; Lambert et al. 2013; Van Leeuwen and Maas 2011).

Some general principles were used when translating NYK-80 + SEI to HISCO:

- In case of confusion between more general or more specific HISCO codes the more general HISCO code is chosen.
- In case an NYK+SEI code clearly includes more than one HISCO code, and a general HISCO code is not available, one random of the several more specific correct HISCO codes is chosen.
- Employees have been marked with STATUS code 11 (owner or proprietor). This coding can be used to distinguish independent professional businesses from other higher salaried employees within similar occupations. Workers

have been marked with STATUS code 32 (“worker”). Lower salaried employees have been marked with STATUS code 33 (“subordinate”). Salaried employees with supervisory tasks have been marked with STATUS code 31 (“principal”).

- Forestry, where no more specific distinction is possible, has been grouped with farming rather than other production. Farm managers and farm supervisors may also refer to managers or foremen in the rest of the primary sector (forestry, fishery, herding/breeding)
- In skilled manual NYK categories (e.g. seamstress, tailor) the combination of this NYK code and SEI 46 (intermediate salaried employee) is often used to refer to teachers or instructors in this topic. This should be, and is, coded into the same HISCO as the occupational group that they instruct.⁵³

The SEI code can almost directly be translated to the EGP class scheme (cf. Jonsson, 1998, 2004). However, it is defined differently in different years. It generally distinguishes white-collar (*tjänstemän*) from blue-collar (*arbetare*) workers and distinguishes employees from employers. All employees are distinguished by skill level from 1980, but not explicitly in 1960 and 1970. Blue-collar workers are distinguished by sector (services or goods), and white-collar workers are distinguished by managerial duties. Employers are further distinguished by farm/non-farm and in 1960 and 1970 farm workers are also explicitly distinguished from non-farm workers. In 1960 and 1970 the military forms a separate SEI class.

The occupational “NYK” coding in 1960 and 1970 also differ somewhat from the NYK80 code available from the 1980 census. These codes can straightforwardly be recoded to NYK-80. When recoding NYK-80 + SEI combinations to HISCO codes I have first used all NYK-80 + SEI combinations that occurred in the 1985 census (Statistics Sweden 1989a). In years with different SEI coding, or with NYK-80 + SEI combinations that did not occur in the initial listing, I have assigned HISCO codes belonging to a similar NYK80 + SEI combination. In some cases the interpretation of the 1960 and 1970 SEI is rather broad. For example, a 1960 SEI code 8 (“employee in service sector”) could be an unskilled service worker, skilled service worker, or any kind of salaried employee.

The occupational registers are coded using SSYK-96 and SSYK-12, Swedish occupational codes with strong resemblance to ISCO-88 and ISCO-08 (Statistics Sweden 1998, 2012). To derive microclasses for the period 2001-2016 I convert SSYK-12 to SSYK-96, and SSYK-96 to ISCO-88 using existing keys (Bihagen 2007; Statistics Sweden 2016). I also convert ISCO-88 to HISCO via ISCO-68 to

⁵³ See van Leeuwen et al., 2002 for details. If desired, vocational training instructors can be retrieved by selection on SEI 46 and on manual HISCLASS and excluding foremen. In recent periods with vocational schools rather than on the job training it may be reasonable to classify these groups as non-manual workers.

derive HISCLASS for the 2000s (cf. Dribe & Helgertz, 2016). This conversion is unproblematic as SSYK, ISCO since 1968 and HISCO are derived in a similar way (Bihagen 2007; Leeuwen et al. 2002). However, occupational information is missing far more often in the annual occupational registers than in the historical and modern censuses. To make measurement more consistent over time, I use a status indicator for benchmark years 2002, 2010 and 2015. This is based on the SSYK values for a three-year period around the benchmark year. For example, the 2010 HISCO is based on any observed occupations for an individual during 2009-2011.

Appendix: figures and tables

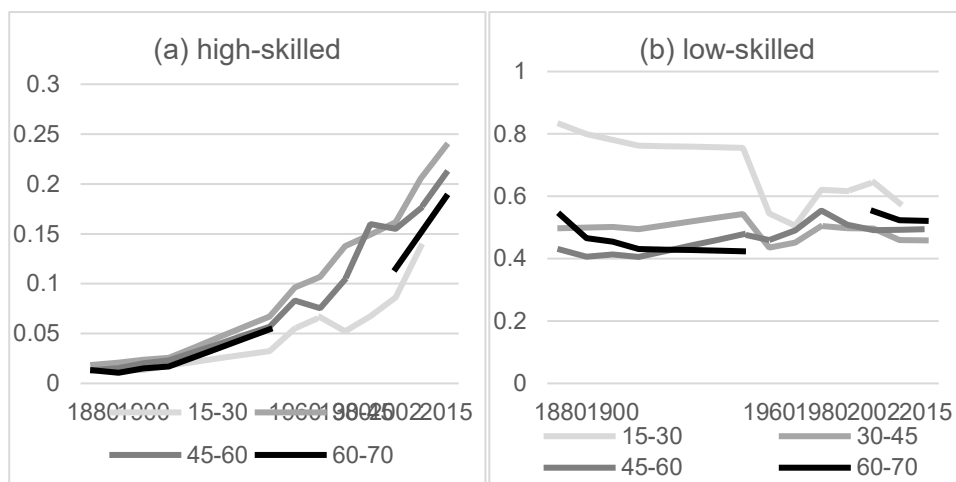


Figure A.1: Proportion of workforce among (a) low- and (b) high-skilled classes by age group

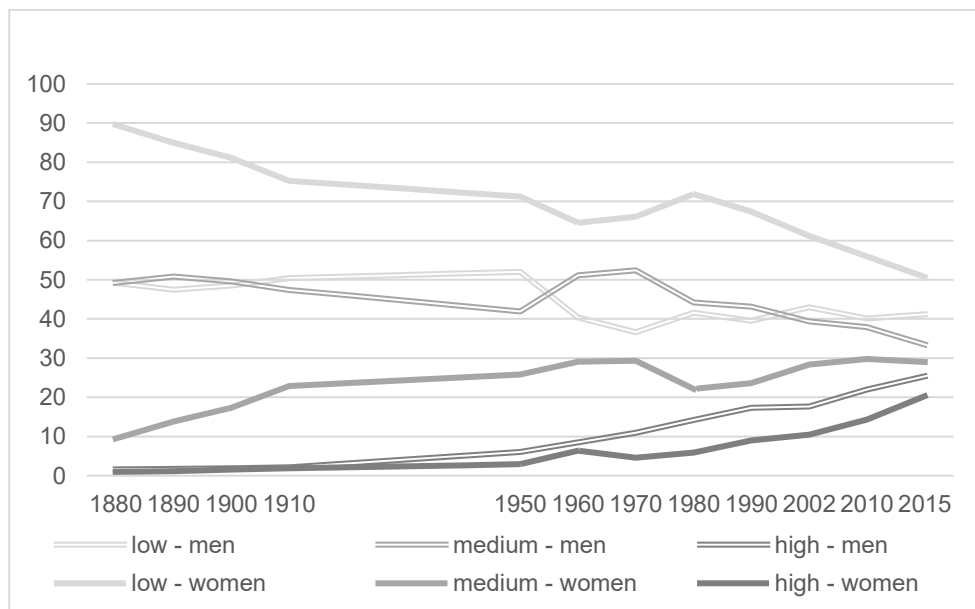


Figure A.2: Distribution of skill levels among the Swedish-born workforce aged 15-70 through 1880-2015. As based on the skill division made in the HISCLASS classification. See main text for information on sources and definitions.

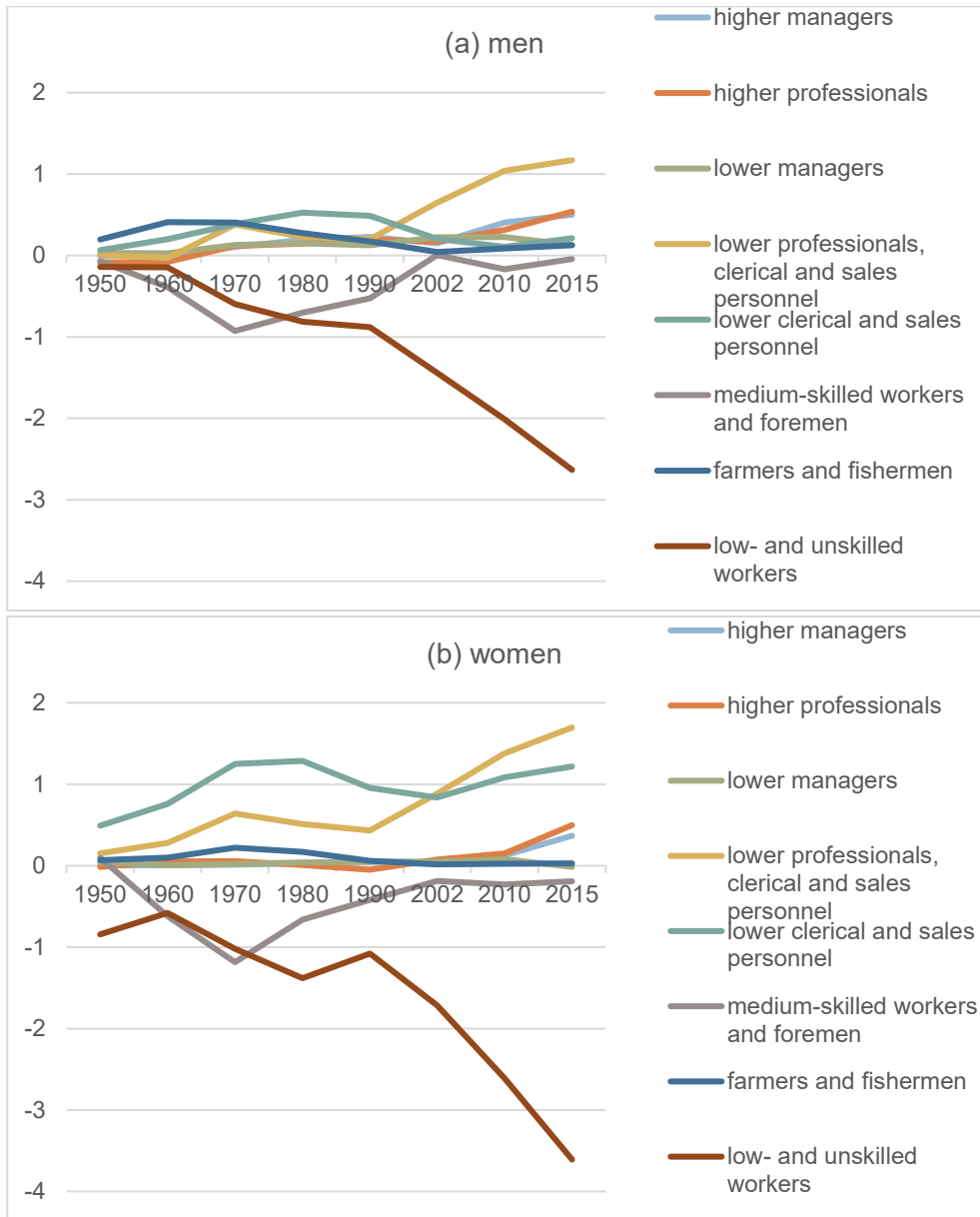


Figure A.3: Social stratification among Swedish-born and the full Swedish population: overrepresentation of Swedish-born in each social class among (a) men and (b) women. Overrepresentation given as: share of all Swedish-born workforce in class X – share of workforce in class X.

Table A.1: Microclass distribution among men and women over time, Swedish workforce aged 15-70. Historical microclasses based on HISCO as in Griffiths et al. 2018 in 1880-1990, contemporary microclasses based on ISCO-88 cf. Jonsson 2009. Historical labels, see asterix and notes below for classes where labels differ substantially. See main text for other information on sources and definitions.

MEN	1880	1890	1900	1910	1950	1960	1970	1980	1990	2002	2010	2015 ⁵⁴
Jurists	0.25	0.23	0.26	0.18	0.23	0.20	0.22	0.32	0.37	0.54	0.54	0.61
Health professionals	0.23	0.30	0.33	0.29	0.41	0.45	0.58	0.92	1.03	1.58	1.16	1.39
Professors and instructors	0.03	0.03	0.04	0.03	0.05	0.11	0.37	0.51	0.55	1.76	1.04	1.24
Natural scientists	0.01	0.02	0.04	0.05	0.14	0.24	0.28	0.51	0.62	0.14	0.32	0.28
Statistical and social scientists	0.00	0.01	0.03	0.00	0.05	0.32	0.52	0.70	1.34	0.24	0.32	0.47
Architects	0.01	0.02	0.02	0.03	0.07	0.18	0.11	0.50	0.44	0.22	0.23	0.28
Accountants	0.07	0.07	0.09	0.12	0.54	0.14	0.21	0.26	0.31	0.44	0.56	0.51
Journalists, authors, and related writers	0.03	0.05	0.07	0.09	0.27	0.38	0.62	0.83	1.10	0.66	0.62	0.62
Engineers	0.20	0.24	0.39	0.48	2.25	1.78	2.88	3.30	3.85	0.79	2.70	3.67
Officials, government and non-profit organizations	0.42	0.40	0.41	0.37	0.45	0.48	0.72	1.20	1.08	0.35	0.31	0.63
Managers	0.36	0.41	0.59	0.78	3.27	2.62	2.71	1.72	2.79	4.75	5.21	4.86
Commercial Managers	0.00	0.01	0.02	0.03	0.02	2.40	3.13	2.99	3.27	4.95	5.77	5.81
Building managers and proprietors	0.01	0.01	0.01	0.01	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Systems analysts and programmers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.44	1.12	2.21	3.46	4.61
Aircraft pilots and navigators	0.00	0.00	0.00	0.00	0.08	0.04	0.06	0.07	0.09	0.06	0.11	0.03
Personnel and labor relations workers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.08	0.39	0.48	0.62
Elementary and secondary school teachers	0.79	0.78	0.78	0.72	0.85	1.58	2.37	3.25	3.09	4.93	2.85	2.53
Librarians	0.00	0.00	0.00	0.01	0.03	0.07	0.09	0.14	0.16	0.17	0.13	0.15
Creative artists	0.27	0.26	0.27	0.25	0.52	0.54	0.64	0.61	0.72	0.67	0.71	0.87
Ship officers	0.85	0.77	0.78	0.62	0.34	0.38	0.31	0.32	0.21	0.23	0.17	0.15
Professional, technical, and related workers, n.e.c.	0.07	0.09	0.11	0.11	0.20	0.28	0.32	0.40	0.53	0.65	0.79	0.69
Social and welfare workers	0.00	0.00	0.00	0.00	0.02	0.10	0.23	0.49	0.68	1.36	0.82	0.98
Workers in religion	0.43	0.41	0.45	0.35	0.33	1.36	0.48	0.41	0.35	0.29	0.17	0.14
Nonmedical technicians	0.02	0.03	0.06	0.10	0.59	4.56	6.66	5.95	6.11	4.25	6.87	6.10
Health semiprofessionals	0.02	0.03	0.06	0.09	0.27	0.44	0.76	0.86	1.07	1.00	0.84	1.23
Hospital attendants	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.11	1.45	1.60
Nursery school teachers and aides	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.76	1.02	1.62
Proprietors	2.18	2.41	2.78	2.84	2.89	1.47	1.59	0.98	0.86	0.00	0.00	0.00
Real estate agents	0.01	0.01	0.01	0.08	0.15	0.23	0.26	0.33	0.48	0.38	0.39	0.31
Other agents	0.11	0.21	0.37	0.53	0.49	0.00	0.00	0.81	0.35	3.40	4.84	5.58
Insurance agents	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.38	0.29	0.29
Cashiers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.18	0.46
Sales workers and shop assistants	0.45	0.55	0.73	1.01	1.94	3.51	2.63	2.94	3.18	5.67	3.38	3.11

⁵⁴ Lower precision of social stratification measures in the 2000s, especially 2015, because of the additional translation of SSYK-12 codes to SSYK-96, then to ISCO-88, then to HISCLASS and HISCAM (indirectly; → ISCO-68 → HISCO → HISCLASS/HISCAM) and microclass (directly). Some of the distinction between managerial and professional gets lost in translation.

MEN	1880	1890	1900	1910	1950	1960	1970	1980	1990	2002	2010	2015
Telephone operators	0.04	0.02	0.02	0.02	0.09	0.09	0.07	0.05	0.05	0.06	0.14	0.04
Bookkeepers and related workers	1.01	1.10	1.31	1.31	0.73	1.29	1.30	1.48	1.38	0.96	0.58	0.60
Office and clerical workers	0.53	0.68	1.11	1.60	4.32	2.25	3.50	3.90	3.47	4.64	4.65	5.51
Postal and mail distribution clerks	0.10	0.14	0.19	0.38	0.70	1.15	0.84	0.91	1.05	1.46	0.65	0.48
Craftsmen and kindred workers, n.e.c.	0.05	0.07	0.11	0.80	0.52	0.16	0.11	0.06	0.05	0.01	0.01	0.00
Foremen	0.62	0.69	0.94	1.05	2.26	1.74	2.13	2.41	1.94	0.00	0.00	0.00
Electronics service and repair workers	0.00	0.00	0.00	0.01	0.11	0.00	0.00	0.00	0.00	1.80	2.40	0.96
Printers and related workers	0.34	0.43	0.57	0.75	0.92	1.17	1.16	1.09	1.07	0.70	0.64	0.49
Locomotive operators	0.08	0.14	0.29	0.49	0.42	0.37	0.33	0.22	0.18	0.04	0.22	0.26
Electricians	0.00	0.03	0.19	0.43	1.83	3.33	4.12	4.03	4.22	0.00	0.00	0.00
Tailors and related workers	4.74	5.09	5.16	3.96	1.62	1.12	0.69	0.51	0.41	0.12	0.10	0.15
Vehicle mechanics	0.00	0.00	0.00	0.00	0.54	3.56	3.95	3.96	3.43	1.61	2.42	2.75
Blacksmiths and machinists	2.46	2.31	2.68	3.26	2.90	0.44	0.32	0.22	0.21	0.45	0.46	0.89
Jewelers, opticians, and precious metal workers	0.49	0.61	0.86	1.00	0.82	0.91	0.79	0.63	0.55	0.26	0.26	0.16
Other mechanics	0.07	0.11	0.25	0.46	2.52	4.90	5.56	5.11	4.81	0.00	0.00	0.00
Plumbers and pipe-fitters	0.01	0.02	0.06	0.16	0.92	1.39	1.57	1.26	1.37	0.68	0.85	0.90
Cabinetmakers	0.24	0.29	0.41	0.54	0.74	2.29	1.98	1.00	0.83	0.10	0.11	0.32
Bakers	0.41	0.51	0.60	0.63	0.96	0.85	0.53	0.37	0.40	0.26	0.29	0.08
Welders and related metal workers	0.43	0.59	0.75	0.81	1.48	2.66	3.02	3.03	2.83	1.86	1.58	1.21
Painters	0.69	0.94	1.12	1.36	1.70	1.74	1.66	1.44	1.50	0.98	0.87	1.24
Butchers	0.16	0.26	0.38	0.46	0.58	0.43	0.44	0.43	0.41	0.11	0.14	0.16
Stationary engine operators	0.30	0.46	0.82	0.91	1.19	1.21	1.36	1.39	1.31	0.47	0.43	0.42
Bricklayers, carpenters, and related construction workers	2.88	3.49	4.46	5.35	6.84	6.29	6.47	5.73	6.17	4.18	5.51	4.61
Heavy machine operators	0.16	0.24	0.41	0.50	1.67	0.99	1.52	1.13	0.97	1.38	1.61	1.60
Truck drivers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.35	2.75	2.35
Chemical processors	0.32	0.41	0.63	1.42	1.33	1.94	1.88	1.69	1.56	0.99	1.10	1.09
Miners and related workers	0.69	1.18	2.04	1.97	0.72	0.73	0.58	0.58	0.44	0.16	0.23	0.23
Longshoremen and freight handlers	0.12	0.23	0.54	1.13	3.10	3.34	2.87	3.05	2.77	0.00	0.00	0.00
Food processors	0.89	1.05	1.34	1.31	0.78	0.56	0.41	0.42	0.36	0.00	0.01	0.00
Textile workers	0.36	0.36	0.48	0.62	1.14	0.60	0.35	0.23	0.16	0.09	0.14	0.14
Sawyers and lumber inspectors	0.22	0.77	1.16	1.83	1.14	0.33	0.35	0.62	0.51	1.99	1.29	1.06
Metal processors	0.64	1.24	1.99	1.62	2.35	1.82	1.56	1.22	0.92	2.04	2.54	2.70
Operatives and kindred workers, n.e.c.	4.45	4.18	3.97	3.21	0.96	1.12	1.04	0.90	0.75	2.77	3.05	2.41
Forestry workers	0.34	0.70	1.08	2.57	3.38	3.22	2.01	1.48	1.07	0.49	0.24	0.82
Protective service workers	0.52	0.54	0.67	0.65	0.82	1.03	1.37	1.73	1.79	2.13	1.72	1.79
Transport conductors	0.06	0.07	0.09	0.17	0.25	0.07	0.02	0.42	0.24	0.02	0.06	0.13
Food service workers	0.09	0.09	0.12	0.15	0.39	0.50	0.61	0.96	1.46	1.18	1.68	1.51
Mass transportation operators	0.38	0.58	0.98	1.51	4.13	5.03	5.19	5.01	4.88	1.52	2.15	1.95
Service workers, n.e.c.	0.07	0.07	0.07	0.07	0.06	0.09	0.09	0.65	0.93	3.90	2.38	2.05
Hairdressers	0.03	0.07	0.11	0.17	0.33	0.32	0.26	0.17	0.14	0.11	0.10	0.15
Laundresses and dry-cleaners	0.05	0.09	0.15	0.21	0.30	0.45	0.48	0.77	0.94	0.00	0.00	0.00
Housekeeping workers	0.27	0.24	0.12	0.26	0.09	0.01	0.02	0.12	0.19	4.57	3.41	3.47

Janitors and cleaners	0.48	0.46	0.61	0.64	0.83	1.03	1.16	1.94	2.37	2.84	2.20	2.05
Gardeners	0.44	0.51	0.62	0.72	1.05	0.66	0.69	0.69	0.64	0.00	0.00	0.00
Fishermen	0.91	0.95	0.90	0.94	0.71	0.05	0.04	0.18	0.15	0.06	0.08	0.16
Farmers and farm managers	41.8 1	37.8 6	32.9 0	26.2 2	14.0 7	10.0 3	5.13	3.13	1.90	2.76	2.54	1.58
Farm laborers	18.4 0	17.6 4	13.3 3	14.3 7	8.18	2.02	0.88	0.76	0.46	0.19	0.12	0.07
Members of armed forces	5.86	5.16	4.71	2.85	1.06	0.90	0.85	1.07	0.92	1.26	0.56	0.00

WOMEN	1880	1890	1900	1910	1950	1960	1970	1980	1990	2002	2010	2015
Jurists	0.03	0.03	0.04	0.04	0.05	0.02	0.04	0.08	0.17	0.27	0.55	0.69
Health professionals	0.03	0.05	0.09	0.15	0.37	0.22	0.26	0.55	0.69	0.95	1.28	1.53
Professors and instructors	0.01	0.01	0.01	0.01	0.01	0.03	0.15	0.21	0.28	0.91	0.86	1.01
Natural scientists	0.00	0.00	0.00	0.02	0.15	0.14	0.10	0.19	0.33	0.08	0.25	0.22
Statistical and social scientists	0.00	0.04	0.20	0.00	0.01	0.13	0.21	0.39	1.17	0.38	0.79	1.40
Architects	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.06	0.10	0.10	0.20	0.29
Accountants	0.02	0.02	0.03	0.04	0.05	0.03	0.06	0.07	0.21	0.39	0.75	0.68
Journalists, authors, and related writers	0.00	0.01	0.01	0.04	0.47	0.18	0.30	0.38	0.64	0.47	0.79	0.91
Engineers	0.02	0.02	0.04	0.08	0.05	0.04	0.12	0.14	0.34	0.08	0.66	0.96
Officials, government and non-profit organizations	0.09	0.09	0.11	0.15	0.04	0.13	0.33	0.75	1.13	0.76	0.98	1.69
Managers	0.13	0.22	0.32	0.47	1.77	0.45	0.83	0.20	0.79	1.37	2.46	2.84
Commercial Managers	0.00	0.00	0.00	0.01	0.01	0.37	0.61	0.57	1.07	1.72	3.43	5.65
Building managers and proprietors	0.03	0.03	0.04	0.04	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Systems analysts and programmers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.32	0.41	1.00	1.32
Aircraft pilots and navigators	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.02	0.02
Personnel and labor relations workers	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.21	0.20	0.61	1.13	1.48
Elementary and secondary school teachers	2.16	3.28	4.23	4.79	4.22	4.61	5.69	7.82	8.43	7.21	5.94	5.47
Librarians	0.00	0.00	0.00	0.00	0.03	0.22	0.35	0.47	0.55	0.35	0.36	0.40
Creative artists	0.11	0.13	0.14	0.20	0.34	0.37	0.45	0.44	0.70	0.40	0.65	0.79
Ship officers	0.15	0.19	0.22	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03
Professional, technical, and related workers, n.e.c.	0.03	0.10	0.19	0.26	0.22	0.16	0.21	0.25	0.36	0.17	0.32	0.29
Social and welfare workers	0.01	0.01	0.01	0.02	0.07	0.42	0.77	1.59	2.15	2.42	2.24	2.56
Workers in religion	0.14	0.16	0.22	0.20	0.33	3.53	0.18	0.21	0.28	0.10	0.10	0.11
Nonmedical technicians	0.00	0.01	0.01	0.04	0.46	1.14	1.27	1.50	1.62	1.13	2.02	1.94
Health semiprofessionals	0.85	1.10	1.59	2.15	4.38	9.32	12.8 8	8.85	11.6 0	5.52	5.43	6.23
Hospital attendants	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	12.4 6	11.8 0	6.92
Nursery school teachers and aides	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.1 5	8.37	9.36
Proprietors	1.08	1.80	2.52	3.62	2.60	0.88	0.71	0.32	0.38	0.00	0.00	0.00
Real estate agents	0.00	0.00	0.00	0.01	0.16	0.17	0.39	0.28	0.55	0.10	0.18	0.18
Other agents	0.00	0.01	0.04	0.08	0.04	0.00	0.00	0.12	0.09	1.14	2.97	2.29
Insurance agents	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.29	0.29	0.28
Cashiers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.73	0.76
Sales workers and shop assistants	0.45	0.91	1.62	3.27	9.76	14.2 8	10.4 9	7.58	6.06	8.15	5.74	4.76
Telephone operators	0.06	0.16	0.36	0.94	3.18	2.66	1.66	1.29	0.86	0.40	0.48	0.15

WOMEN	1880	1890	1900	1910	1950	1960	1970	1980	1990	2002	2010	2015
Bookkeepers and related workers	0.06	0.21	0.51	1.18	2.64	5.75	6.64	7.27	5.76	4.44	3.79	3.57
Office and clerical workers	0.12	0.31	0.74	1.89	12.5 6	11.2 6	16.0 6	16.3 3	14.2 6	10.1 3	10.1 5	7.82
Postal and mail distribution clerks	0.02	0.04	0.06	0.12	0.15	0.31	0.62	0.50	0.73	0.72	0.43	0.28
Craftsmen and kindred workers, n.e.c.	0.01	0.02	0.03	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Foremen	0.07	0.09	0.12	0.24	0.14	0.14	0.17	0.62	0.75	0.00	0.00	0.00
Electronics service and repair workers	0.00	0.00	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.04	0.08	0.02
Printers and related workers	0.12	0.20	0.30	0.56	0.55	0.69	0.56	0.53	0.54	0.18	0.23	0.13
Locomotive operators	0.00	0.01	0.01	0.05	0.00	0.00	0.00	0.01	0.02	0.00	0.03	0.04
Electricians	0.00	0.00	0.01	0.03	0.03	0.74	0.96	0.90	0.86	0.00	0.00	0.00
Tailors and related workers	3.21	5.35	7.75	9.28	8.32	6.58	3.19	1.41	0.91	0.11	0.14	0.22
Vehicle mechanics	0.00	0.00	0.00	0.00	0.00	0.25	0.69	0.99	0.69	0.01	0.04	0.08
Blacksmiths and machinists	0.23	0.17	0.22	0.50	0.10	0.00	0.00	0.01	0.01	0.01	0.03	0.18
Jewelers, opticians, and precious metal workers	0.11	0.16	0.15	0.32	0.16	0.31	0.26	0.23	0.17	0.05	0.06	0.03
Other mechanics	0.00	0.00	0.01	0.02	0.12	0.77	0.97	0.57	0.65	0.00	0.00	0.00
Plumbers and pipe-fitters	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.01	0.01	0.00	0.01	0.01
Cabinetmakers	0.04	0.04	0.04	0.06	0.02	0.13	0.26	0.10	0.09	0.01	0.02	0.09
Bakers	0.19	0.40	0.68	1.11	1.13	0.72	0.44	0.26	0.25	0.05	0.07	0.06
Welders and related metal workers	0.03	0.05	0.06	0.11	0.02	0.02	0.07	0.17	0.15	0.03	0.04	0.03
Painters	0.04	0.08	0.10	0.18	0.03	0.05	0.07	0.08	0.10	0.02	0.04	0.06
Butchers	0.03	0.04	0.05	0.09	0.19	0.12	0.16	0.08	0.13	0.01	0.02	0.02
Stationary engine operators	0.02	0.04	0.06	0.12	0.05	0.00	0.06	0.09	0.10	0.01	0.04	0.03
Bricklayers, carpenters, and related construction workers	0.29	0.30	0.34	0.78	0.07	0.03	0.05	0.24	0.21	0.02	0.12	0.08
Heavy machine operators	0.00	0.00	0.01	0.03	0.01	0.05	0.12	0.11	0.05	0.02	0.07	0.08
Truck drivers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.09	0.08
Chemical processors	0.03	0.06	0.09	0.40	0.44	0.78	0.99	0.72	0.56	0.21	0.42	0.32
Miners and related workers	0.07	0.06	0.07	0.24	0.01	0.01	0.01	0.10	0.07	0.00	0.01	0.01
Longshoremens and freight handlers	0.03	0.06	0.11	0.38	0.90	1.81	1.75	1.44	1.36	0.00	0.00	0.00
Food processors	0.51	1.03	1.21	1.47	0.47	0.68	0.50	0.40	0.26	0.00	0.01	0.01
Textile workers	0.41	1.22	1.86	3.44	3.34	1.73	0.70	0.36	0.18	0.17	0.21	0.16
Sawyers and lumber inspectors	0.02	0.06	0.05	0.22	0.02	0.00	0.01	0.06	0.07	0.27	0.21	0.14
Metal processors	0.03	0.07	0.14	0.19	0.22	0.12	0.19	0.22	0.13	0.17	0.35	0.40
Operatives and kindred workers, n.e.c.	0.32	0.32	0.33	0.50	0.10	0.56	0.39	0.34	0.25	0.82	1.09	0.69
Forestry workers	0.02	0.02	0.03	0.13	0.01	0.06	0.07	0.13	0.05	0.03	0.02	0.33
Protective service workers	0.07	0.07	0.08	0.12	0.18	0.06	0.12	0.31	0.56	0.38	0.65	0.69
Transport conductors	0.00	0.00	0.01	0.02	0.04	0.10	0.04	0.08	0.08	0.02	0.07	0.09
Food service workers	0.31	0.34	0.57	1.08	5.77	7.12	6.34	5.24	5.07	1.51	1.86	1.64
Mass transportation operators	0.04	0.05	0.08	0.17	0.04	0.08	0.25	0.38	0.46	0.14	0.30	0.24
Service workers, n.e.c.	0.02	0.02	0.02	0.03	2.65	0.99	3.49	10.9 2	10.3 3	2.63	1.33	1.06
Hairdressers	0.10	0.11	0.19	0.36	1.49	1.97	1.49	0.98	1.03	0.39	0.62	1.15
Launderers and dry-cleaners	1.28	1.78	2.61	3.44	4.60	5.65	6.60	5.72	5.05	0.00	0.00	0.00
Housekeeping workers	77.1 1	67.4 7	58.5 0	40.4 1	20.0 9	7.16	3.55	4.63	5.39	17.5 7	13.5 2	16.1 0

Janitors and cleaners	0.12	0.17	0.21	0.27	0.16	0.34	0.34	0.26	0.33	0.27	0.26	0.28
Gardeners	0.03	0.04	0.05	0.13	0.22	0.39	0.33	0.27	0.21	0.00	0.00	0.00
Fishermen	0.12	0.12	0.13	0.24	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.02
Farmers and farm managers	8.35	9.73	9.24	9.53	3.27	2.44	3.20	2.02	0.77	0.57	0.73	0.52
Farm laborers	0.33	0.76	0.67	2.95	0.43	0.52	0.25	0.29	0.27	0.08	0.06	0.04
Members of armed forces	0.64	0.57	0.44	0.57	0.01	0.00	0.00	0.02	0.03	0.03	0.02	0.00

Paper II



A Schumpeter Hotel? Surname status Persistence in Sweden 1880-2016⁵⁵

Elien Dalman

Martin Dribe

Björn Eriksson

Abstract: Conventional social mobility research misses substantial inequalities of opportunity. To capture intergenerational persistence of family social status, we need to move beyond parent-child associations in occupation or income. Models that incorporate surname group belonging show that families do not regress to a population mean at the speed implied by parent-child associations. Their mobility is further constrained by their ancestors' social status as operationalized through surname group belonging. Failing to include such group-level processes, summary measures such as intergenerational elasticities in occupational status or income will overestimate the relative importance of individual effort and ability on socioeconomic outcomes. We study the inheritance of surname status as a group-level process, using full-count population data for Sweden between 1880 and 2016. We use surname groups rather than individual surnames as our analyses of the 'informational content' of surnames show that social stratification by surnames occurs primarily at the level of surname types associated with pre-industrial social strata, rather than at the level of individual lineages – especially before 1950. Surname status persistence is almost as high in the modern Swedish welfare state as it was in preindustrial times. The status structure of surname groups converges only at a slow rate, with differences persisting over at least six generations. Structural transformation and the emergence of the welfare state are not associated with lasting increases in surname status persistence. As a group, families with an agricultural or working-class surname background (patronyms) experience a persistent disadvantage while noble and educated surnames display a consistent advantage. Hence, surname status persistence is not only an elite phenomenon, but present in all social classes.

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Introduction

The common view in social mobility research is that while people in the past were born into a social class (ascription), social status is today achieved through a combination of ability, effort, education and luck (achievement, Treiman 1970). In *The Theory of Economic Development*, Joseph Schumpeter stated that "...the upper strata of society are like hotels which are indeed always full of people, but people who are forever changing. They consist of persons who are recruited from below to a much greater extent than many of us are willing to admit" ([Schumpeter 1934, p. 156](#)). According to this view, the direct influence of fathers' occupational status on sons' occupational status declined as societies developed (Grusky and Hauser 1984; Lipset and Bendix 1959; Lipset and Zetterberg 1956), and perhaps even the indirect influence of parental status through educational attainment (Blau and Duncan 1967; Treiman 1970).

However, studies on intergenerational mobility often make strong limiting assumptions on the form of social mobility (Becker and Tomes 1979, 1986; Hodge 1966; Piketty 2000). Mobility is conceptualized as a uniform regression of generations to a population mean, operationalized as an intergenerational elasticity or correlation between the occupation or income of fathers and sons. That is, a society's level of intergenerational mobility is captured by one coefficient reflecting the average rate of regression to the mean across all social strata. This does not leave room for heterogenous group-level processes of intergenerational transmission ([but see e.g. Adermon, Lindahl, and Palme 2021; Lindahl et al. 2014; Solon 2018; Stuhler 2012](#)). Repeated calls have been made to extend the study of social mobility beyond such parent-child models and focus on the broad, key question of status inheritance – how social environment affects individual stratification outcomes (Hout and DiPrete 2006; Treiman and Ganzeboom 2000).

In this paper, we study long-term patterns of status inheritance in Sweden using surname groups as a measure of social status. We study the inheritance of surname status as a group-level process ([cf. Güell, Rodríguez Mora, and Solon 2018; Torche and Corvalan 2018](#)) in the whole Swedish population. We group surnames by their pre-industrial social status. Previous work incorporating surnames in studies of social mobility shows that families do not regress to a population mean at the speed implied by parent-child social status associations, but substantially slower (Clark 2014; Güell, Rodríguez Mora, and Telmer 2015; Santavirta and Stuhler 2021). This may be because, beyond parental social status, individual mobility is further constrained by other processes of intergenerational transmission shared by members of ancestral status groups and represented by specific surname groups.

Ascribed group attributes might occur at the level of lineages, social classes, neighborhoods, ethnic groups, schools, parental social networks, or other parental work or living environment. They could result from differences in socioeconomic

resources not captured by parental social status (Hällsten and Thaning 2022), but could also result from differences in cultural or social capital, e.g. childrearing practices such as parental time investment, language (dialects/accents) or manners, shared interests, aspirations, and attitudes (cf. Bourdieu 1984; Bourdieu and Passeron 1977). Thus, intergenerational status persistence of surname groups can result from any (dis)advantage transmitted between generations occurring in a similar manner within a surname group. In this way, surname group persistence resembles sibling correlations in the broader mobility literature, also capturing total family background, reflecting both socioeconomic and other pathways of social environment at different levels (cf. Björklund and Jäntti 2020).

Earlier critique of Gregory Clark's work (Clark 2014) on surname mobility suggests that high surname persistence may be limited to elite and particularly disadvantaged groups (e.g. Maas 2015; Torche and Corvalan 2018). We address this question by studying surname status persistence in the entire Swedish population. We study the period 1880-2016, when Sweden transformed from a largely agricultural to a service economy, when education at all levels expanded greatly, and the modern welfare state emerged. We use full-count historical and modern census data covering the entire Swedish population. The study is based on men born from 1820 until 1985 and their occupational status between the ages of 30 and 60 years.

Our study moves beyond the use of surnames as instrumental variables in the study of intergenerational social mobility. Surname, or surname group, is taken to reflect social origin in a broader sense than occupational status or social class. It is assumed to reflect other traits shared by members of social strata or status groupings inherited by subsequent generations. Surname status persistence reflects how the social status of a group, which is distinguished by their status historically (a surname group), relates to the average status of the full population over time. If the average occupational status of the surname group does not converge to the population average as fast as implied by parent-child associations in occupational status, it suggests that there are processes of intergenerational persistence at the group or individual level that are not fully captured by the parent-child association. Moreover, if the surname group does not converge to the population average as fast as implied by multigenerational associations, parent-child associations in socioeconomic status, or two-parent to child associations, it suggests that there are processes of intergenerational persistence at the group or individual level that are not captured by the ancestor-child or compound 'underlying' status association. This is what is suggested by the existing literature on surname status persistence at the group level; rates of regression to the mean are as high as 0.8, which is higher than any other measure of total family background in the literature (Clark 2014).

Furthermore, we evaluate the informational content of surnames (ICS) between and within surname groups (cf. Güell et al. 2015). We contribute to the debate on surname measures of intergenerational persistence with a new perspective on the relevance of name frequency. Previous research has found rarer names to better

explain socioeconomic outcomes than more common names and assumed that this is because they are better able to represent family lineages (Clark 2014; Güell et al. 2015; Santavirta and Stuhler 2021). We argue that frequency of individual surnames may be an imperfect proxy of other characteristics relevant for intergenerational mobility such as social origin (class heterogeneity) and other groupings (e.g. ethnicity, neighborhood) – other than lineages. We test this subgroup-proxy hypothesis by comparing the ICS within and between surname group and by surname frequency.

In the analyses of the informational content of surnames, surname status inequality, and surname status persistence, we use Lorenz curves, “Gini” coefficients, and ICS measures at the level of individual surnames (as in the previous literature) as well as at the surname group level. We find that intergenerational persistence in social status at the surname group level is substantially higher than conventional parent-child associations found in earlier studies of intergenerational transmission of socioeconomic status in Sweden (Adermon et al. 2021; Vosters and Nybom 2017). Importantly, the high status persistence at the surname group level is not limited to elite groups. Nine distinct surname groups, based on ancestors’ social strata, explain a substantial share of the variation in occupational status observed among thousands of individual surnames, indicating strong group-level processes of intergenerational transmission. This, combined with relatively low individual-level intergenerational correlations in socioeconomic outcomes, as generally observed in Sweden, indicates that ascribed attributes captured by surname group played an important role in transmitting advantage across generations over the course of the twentieth and twenty-first century. Although surname status inequality declined significantly in the second half of the twentieth century, surname status persistence remained high throughout a fundamentally changing economic and institutional context.

The structure of the paper is as follows. In section two, we discuss the previous literature and background to the surname approach. In section three, we discuss the context, focusing on Swedish surname practices. Section four explains the empirical strategy, data and methods. Section five contains results on the informational content of surnames and surname groups, as well as surname status inequality and surname status persistence at the level of surname groups. Section six concludes.

The surname approach

Intergenerational mobility in socioeconomic status is substantial in modern societies, and especially in equal societies such as Sweden (e.g. Breen and Müller 2020; DiPrete 2020; Durlauf, Kourtellos, and Tan 2022). Correlations in the range 0.2-0.5 imply that any influence of previous generations virtually disappears within three generations (cf. Becker and Tomes 1979, 1986). A noteworthy exception to the large body of literature finding high intergenerational mobility are studies focusing on surname status persistence (Clark 2014; Güell et al. 2015; Santavirta and Stuhler 2021). Clark finds high intergenerational persistence across societies and time-periods and argues that this reflects parent-child transmission of unobserved “social competence”, which is not captured by conventional estimates (e.g. Clark 2014; Clark and Cummins 2015).

Most studies on intergenerational mobility make strong limiting assumptions on the forms of social mobility that are common in practice (for simple and extensive formalizations of these assumptions, see e.g. Becker et al. 2018; Hodge 1966; Piketty 2000). In particular, intergenerational transmission of social status is assumed to be an AR(1) process with uniform regression of generations to a population mean. There are however several indications that conventional parent-child measures of intergenerational mobility following such assumptions do not capture all components of social origin that affect child socioeconomic attainment. We can distinguish four main kinds of intergenerational transmission omitted in the conventional parent-child measure of intergenerational transmission:

1. Grandparents and other kin may impact child attainment independently of parents. Associations between socioeconomic outcomes of grandparents and grandchildren, net of parental characteristics, are generally confirmed empirically. However, it remains uncertain if they reflect a direct impact or rather capture measurement errors or omitted variable bias (e.g. [Braun and Stuhler 2018](#); [Dribe and Helgertz 2016](#); [Engzell, Mood, and Jonsson 2020](#); [Hällsten and Pfeffer 2017](#); [Helgertz and Dribe 2021](#); [Knigge 2016](#); [Modalsli 2021](#); [Olivetti, Paserman, and Salisbury 2018](#); [Solon 2018](#); [Song 2021](#)).
2. Both parents affect child attainment independently; social origin is often operationalized as the socioeconomic status of the father or ‘dominant’ (highest status) parent, while the status of each parent independently affects child attainment. In the context of differences in social mobility over time and space, omitting one parent can be problematic as levels of assortative mating differ over time and space, changing the extent to which one parent represents the status of the other parent (e.g. Beller 2009; Collado, Ortuno-Ortin, and Stuhler 2018; Dalman 2022; Ermisch, Francesconi, and Siedler 2006; Hout 2018; Kalmijn 1994; Kong, Maas, and van Leeuwen 2020; Mood 2017; Thaning and Hällsten 2020). This problem generalizes to other family types and

demographic factors and can partly be addressed with a prospective study designs (e.g. Song and Mare 2015).

3. Different indicators of social status such as income, occupational status, social class, wealth, or education, represent different, complementary, aspects of social origin. Observing only one indicator might omit intergenerationally transmitted components of family background and thereby underestimate inequality through status inheritance (Adermon et al. 2021; Breen, Mood, and Jonsson 2016; Hällsten 2013; Hällsten and Thaning 2022; Laurison and Friedman 2016; Torche 2015; Vosters and Nybom 2017).
4. The impact of socioeconomic family background on child attainment differs for different parental backgrounds. Specifically, the intergenerational transmission of income and wealth is found to be stronger at the top and bottom of the income distribution (e.g. Björklund, Roine, and Waldenström 2012; Bratsberg et al. 2007). Moreover, intergenerational mobility differs regionally (e.g. Chetty et al. 2014; Güell, Pellizzari, et al. 2018; Heidrich 2017), by ethnicity (e.g. Borjas 1992; Chetty et al. 2020; Davis and Mazumder 2018), by educational attainment (e.g. Torche 2011), and income mobility differs by social class (e.g. Hällsten 2013; Laurison and Friedman 2016).

Evidence of intergenerational persistence beyond uniform parent-child associations suggests that moving beyond parsimonious modeling of intergenerational mobility can yield important insights. Extended intergenerational models including multigenerational transmission have been developed (Solon 2018; Song 2021). Other models account for errors-in-variables bias (Braun & Stuhler 2018) and group effects (Torche & Corvalan 2016; Güell, Rodríguez Mora & Solon 2018). The need to move beyond parent-child models is also indicated by the expanding sibling mobility literature, showing substantially higher intergenerational transmission of total family background between siblings than implied by parent-child intergenerational correlations (e.g. Björklund and Jäntti 2020; Breen and Jonsson 2005).

Our operationalization of surname status persistence builds primarily on the work by Stuhler and Santavirta (2021), who review and synthesize different earlier surname mobility approaches (e.g. Clark 2014, Güell et al. 2015). It is also inspired by the work of Maia Güell and collaborators on group-level mobility processes (Güell, Rodríguez Mora, et al. 2018). The surname approaches have in common that ancestral socioeconomic status (SES) is measured as the average SES of those sharing a surname in an earlier generation. The share of status variance explained by surname dummies (informational content of surnames), or the regression coefficient from a regression of a surname's average SES on a descendant's SES ('grouping estimator'), is taken to indicate surname status persistence.

Stuhler and Santavirta (2021) show that estimates of surname status persistence are sensitive to 1) sample properties such as sample size and the inclusion of actual ancestors in surname group SES ('overlap' between parent and child samples), and 2) group-level transmission processes such as ethnicity (see also Torche & Corvalan 2016).⁵⁶ They also show that once such factors are considered, surname measures of intergenerational mobility are reliable alternatives to conventional measures and suggest comparable mobility patterns. However, parent-child associations and surname persistence may differ depending on what they term the 'added informational content' of surnames that is not captured by conventional parent-child associations in occupational status or income. This added informational content of surnames is context dependent and could arise from group-level differences between surnames that are transmitted over generations, or 'latent' components of SES that are not observed in measured parent and child SES (see also e.g. Solon 2018). Thus, using surname measures of intergenerational transmission is not only a valuable complement to conventional measures because of lower data requirements, it can also broaden our insight in processes of intergenerational transmission.

Conventional estimates of intergenerational mobility require the linking of individuals from different generations, together with individually observed measures of SES. These requirements limit the contexts for which intergenerational associations can be estimated. In the absence of suitable data, surnames have been used to measure social inequality and mobility in the long run, in historical contexts and in regions with limited data availability (e.g. Barone and Mocetti 2021; Clark et al. 2015).

Surnames represent ancestor heritage either by capturing family links (lineages) or by historical social origins of a larger subgroup of lineages. It is mostly the former, genetic, interpretation that has been adopted in the theoretical framework of previous surname mobility studies (Clark 2014; Güell et al. 2015). However, Torche and Corvalan (2016) have shown that surname persistence may reflect group level processes of intergenerational transmission – such as ethnicity. Certain forms of group-level SES differences, reflected by surname group belonging, are transmitted intergenerationally and thereby contribute to inequality through status inheritance.

In line with these findings, our study moves beyond the use of surnames as instrumental variables – representing family lineages – in the study of intergenerational mobility. Surname group is taken to reflect social origin in a broader sense than income or occupational status. It is assumed to reflect other traits

⁵⁶ Low sample overlap, or the probability for an ancestor to be observed in the ancestor sample if his son is observed in the child sample, is an important possible source of bias in estimating the ICS. As Güell et al (2015) we estimate the ICS cross-sectionally on full population censuses. This means that we observe an individual's occupational status at the same time as their surname. Overlap is therefore not a concern in this study.

shared by members of social strata or status groupings inherited by subsequent generations. When thinking about social ‘groups’ transmitted from parents to children Bourdieu’s concept of ‘habitus’ is useful. The ‘habitus’ of surname groups would then be “*defined not only by their position in the relations of production, as identified through indices such as occupation, income, or even education level, but also by [...] a whole set of subsidiary characteristics which may function, in the form of tacit requirements, as real principles of selection or exclusion without ever being formally stated*” (Pierre Bourdieu 1984, *Distinction*, p. 96).

Several forms of intergenerational transmission can be thought of as group-level processes. If parent-child pairs evolve around local average SES of the group to which the family belongs, such as neighborhoods, ethnicities, language, dynasties, social classes or parental social networks, then estimates of parent-child associations that fail to take this into account may greatly overestimate parent-child associations (Torche & Corvalan 2016; Güell, Rodríguez Mora & Solon 2018). This is well-known, and therefore such factors are often controlled for (for neighborhoods and ethnicity, see, e.g., Borjas 1992, 1995; Chetty et al. 2014; Chetty and Hendren 2018a, 2018b; Kremer 1997; Wilson 1971). However, it is unclear whether controlling for such factors leads to a greater understanding of intergenerational persistence of inequality at the societal level. While this can confirm that parent-child persistence within subgroups is low, societal intergenerational persistence of inequality can at the same time be high when subgroup belonging is a family trait. The most straightforward example of this is direct influences of the SES of kin outside the nuclear family. Importantly, other forms of subgroup belonging that are partly or entirely determined by parental influences (e.g. ethnicity) may also increase intergenerational persistence at a population level while direct parent-child correlation could be more limited.

The status groups we study are Swedish social strata rooted in the pre-industrial system of social stratification (based on *stånd* or Weberian status, see e.g. Carlsson 1949; Fahlbeck 1892; Weber 1978 [1921]). Groups with either cultural (higher-educated), political (nobility, clergy), or economic (bourgeoisie) distinction signaled this by adopting surnames reflecting their specific social status group belonging. This happened before as well as during industrialization (Brylla 2005; Hedberg 2019; Nyström et al. 2021), but we only distinguish surname types reflecting pre-industrial social strata adopted primarily in the nineteenth century and earlier.

If the status of all families converges to the population mean at the rate implied by parent-child intergenerational correlations, as suggested by the Becker-Tomes model (Becker and Tomes 1986), then surname groups will converge to the population mean at the same rate. But if higher surname status persistence is observed than what is expected from parent-child measures (cf. Clark 2012), this implies that not all the social mobility between generations within families concerns convergence to the population mean, and thus high levels of mobility cannot be

interpreted to imply that the influence of previous generations disappears within a few generations.

If the trajectory of the average member of a surname group is representative of mobility in the full population, and the level of social stratification is constant over time, then ‘surname status persistence’ is equivalent to intergenerational elasticities and intergenerational correlations. However, if part of the mobility experienced by individuals evolves around their surname group mean rather than towards the population mean, then we will miss within-group mobility when observing surname status persistence (Torche & Corvalan 2016; Solon 2018; Güell, Rodríguez Mora & Solon 2018). Within-group and between-group mobility are qualitatively different types of mobility. Within-group mobility that is not captured by between-group mobility implies that a group maintains its relative (dis)advantage. Between-group mobility, on the other hand, implies that a group gradually loses its relative (dis)advantage. Thus, within-group mobility is less consequential for equality of opportunity in a society than between-group mobility. Therefore, studying group-level mobility alongside individual-level mobility furthers our understanding of status inheritance at the societal level.

This means that surname status persistence can be higher than parent-child measures of intergenerational transmission because it only captures ‘between-group’ mobility. Surname status persistence can be used to uncover which types of mobility parent-child measures of intergenerational transmission encompass. Does mobility in a society mean that lineages gradually move from rags to riches, or from riches to rags, or does mobility merely mean that lineages are ‘locally mobile’ around their group’s socioeconomic status? In other words, we can use measures of surname status persistence to assess the persistence of social stratification and answer the question of which lineages ‘get ahead’ in the long run.

Surname status persistence is conceptualized as a component of status inheritance not entirely captured by parent-child associations in SES (cf. added informational content of names in Santavirta & Stuhler 2021). We expect both between-group intergenerational transmission processes captured by surname status persistence, and within-group intergenerational transmission processes captured by parent-child associations within surname groups (cf. Güell, Rodríguez Mora & Solon 2018). Thus, intergenerational mobility at the level of the individual is assumed to be decomposable into within-group mobility around a group-average, and between-group mobility. Between-group mobility necessarily decreases inequality due to status inheritance over the long term, while within-group mobility may not do so. We study between-group mobility using surname groups and within-group mobility using individual surnames.

Swedish surname practices

This section details evolving Swedish surname practices in the context of a fundamentally changing Swedish social structure over the nineteenth and twentieth centuries. Swedish industrialization had begun by 1850 and took off in earnest in the decades leading up to 1900. From 1890 until the middle of the twentieth century, the country outpaced the rest of the world in terms of economic growth, and especially in the earlier period in terms of real wage growth (Schön 2012). The late nineteenth and first half of the twentieth century marked an important structural shift in the Swedish labor market, from predominantly agricultural to predominantly industrial. During subsequent decades, the Swedish economy became post-industrial, as services rather than manufacturing came to dominate the labor market from 1970. However, the expansion of the service sector started earlier and is observed throughout the period of 1880-2016. In figure 1, we see how these structural transformations are reflected in the social structure of men aged 30-60. The figure shows structural upward mobility as the distribution of standardized occupational status values becomes higher over time (for a description of HISCAM, see the data and methods section).

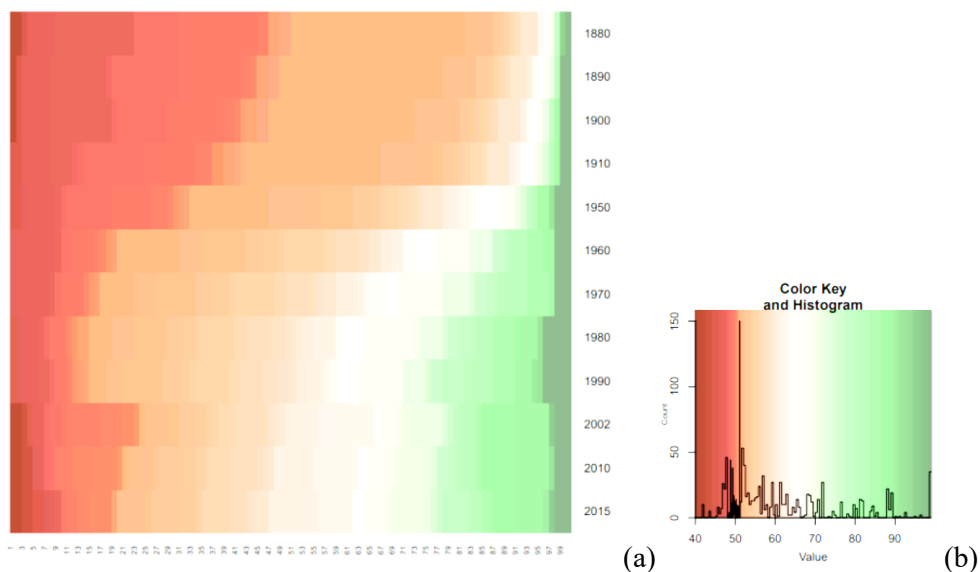


Figure 1 Heatmap of population HISCAM values by census year. HISCAM values are represented by colors as defined in figure (b), which also presents the frequency of different HISCAM values. In figure (a) each row represents the sample population in that census year. For each percentile on the x-axis the HISCAM value at that percentile in that census year is depicted by its color code. The sample population consists of men aged 30-60 in Sweden over 1880-2016.

The classes of farmers and farm workers, the bottom of the occupational status distribution, were replaced by higher-status non-manual classes over time. As the general social structure of the Swedish workforce changed, its link to historical institutions also faded. Aristocratic distinction was important in pre-industrial Sweden and is reflected in surname practices. Although only Clark (2012) has so far used some of these distinctions to study social stratification and intergenerational mobility in Sweden, these prestige differences between surname groups have been noted repeatedly by linguists (Brylla 2005, 2009, 2011, 2014; Frändén 2010, 2014, 2017; Hedberg 2019; Nyström et al. 2021; Utterström 1985, 1994).

Surnames contain information on the social status origin of individuals. They are generally inherited over generations and are often informative about the prestige of ancestors at the time of adoption. Traditional Swedish surnames appear to be particularly informative about ancestral prestige, as they are explicitly rooted in the pre-industrial system of social stratification (Nyström et al. 2021). Most Swedish surnames used in 1880-1950 fall into distinct groups reflecting their prestige in the historical system of social stratification (in Swedish: *stånd*, cf. *Stände* in German, see e.g. Carlsson 1949, 1966; Fahlbeck 1892; Weber 1978 [1921]). Pre-industrial social stratification of surname groups thus reflect “*stånd*” heritage, or Weberian “social status”. Status groups did not necessarily reflect economic distinction but are primarily associated with cultural and social capital. Although such social stratification in the long run also leads to economic distinction among those with high status, status is not dependent on economic resources and is more persistent than for example wealth (Weber 1978 [1921]).

The social stratification reflected by surname groups is for example reflected in concrete power differences, as the nobility, clergy, bourgeoisie and farmers each had their own political representatives in the Swedish Diet of Four Estates (*ståndsriksdagen*) from the mid-fifteenth century until 1866 (e.g. Carlsson 1949).⁵⁷ The use of unconventional surnames was largely limited to high status groups of different kinds, including the few with higher educational qualifications. In pre-industrial Sweden, patronyms referring to the name of one’s father were used among all social classes. This did not change for most of the population until the eighteenth and nineteenth century, although in coastal cities and the north the use of other fixed surnames began already in the late seventeenth century. Adoption of fixed surnames was particularly uncommon before 1900 in the formerly Danish regions in the south of Sweden, which is still evident from the prevalence of patronymic surnames in the south today (Nyström et al. 2021).⁵⁸ Surname adoption became widespread in

⁵⁷ Not all of the Swedish population was represented by these estates, as the ‘farmer’ estate was exclusively open for landholding farmers (and iron producers - *bergsman*). Thus, a substantial share of the Swedish population was estateless.

⁵⁸ Legally, families were almost fully free to choose and change their surnames until 1901, when the process was formalized. Before 1901, only the use of noble surnames was formally restricted. However, as family names or surnames were adopted with the purpose of signalling family

aristocratic circles in the seventeenth century, and thereafter spread to other social groups. The emergence of fixed surnames was relatively late in the European context. In, for example, Italy, surnames were commonly used as early as the fifteenth century (see e.g. Barone and Mocetti 2021). Patronymy and names with geographical and occupational reference are common throughout Europe (Debus, Heuser, and Nübling 2014; Heuser, Nübling, and Schmuck 2011). The adoption of patronymy as surnames was also common among the broad majority of farmers and (non-)farm workers in Sweden.

The first status group with distinct surnames consists of surnames adopted by the nobility. These are identified as surnames listed by *Riddarhuset* as ‘titled’ (higher) and ‘untitled’ (lower) noble lineages, and their usage was formally restricted to paternal descendants of the title holder from 1626 until the 1980s.⁵⁹ In pre-industrial Sweden, noble lineages would be expected to hold high-status occupations, either as a land-owning elite, in the military or within the state apparatus – being strongly overrepresented in the legislative, executive and judiciary power (e.g. Carlsson 1949).

Democratic government may have led to policies and institutions better representing the interest and wellbeing of the whole population rather than aristocratic elites. Thereby, democracy may increase the chances of those from lower social origins to attain high social status. Aristocratic elites such as nobility may dominate governing and other high status institutions less after the introduction of democracy (but see e.g. Norrby 2005). Over the period studied, political democracy was gradually expanded in Sweden. In 1880, Sweden was a monarchy with a two-chamber parliament, elected by a minority of men who fulfilled the rather strict age, income,

belonging, surname change was likely not that frequent in practice. Quantitative accounts on this are lacking. Changing surnames was and is often associated with important life-course transitions such as migration, marriage, childbirth and graduation (Brylla 2005, 2011, 2014; Nyström et al. 2021; Utterström 1994). In certain contexts, the lack of legislation on fixed surnames led to high rates of surname change; supposedly only about 10% of prison inmates bearing noble surnames belonged to the nobility (Leibring 2012). This was addressed, and having a surname became compulsory in 1915. During much of the twentieth century, the possibility to change one’s surname was limited legally. Following new legislation in 1982 and 2016, adopting new names has again become comparatively easy in Sweden. Since the 1990s, adopting surnames that signal high social status, such as those resembling noble names, has become increasingly popular (Brylla 2005; Leibring 2012). Surname change by ethnic minorities has been used as an assimilation strategy historically as well as today (Frändén 2010, 2020).

⁵⁹ A selection of names from the *Riddarhuset* list with rapidly increasing number of bearers, or a high number of bearers throughout, are excluded. Examples of excluded names are common foreign names reserved for a noble lineage in Sweden; migrants were not required to change their ‘noble’ name upon entry to Sweden. Although many noble surnames have a distinct connotation due to heraldic elements, we define the surname group based on noble heritage rather than name connotation; many noble-sounding names never had noble bearers and many noble names do not have a noble-sounding, heraldic, connotation. In the historical sample, we can separate titled nobility (*friherrlig*, *grevlig* and *kommendör*) from untitled nobility (*adlig*).

and wealth criteria. Universal suffrage for adult men and women was (more) fully introduced in 1919/1921 (see e.g. Bengtsson 2019).

The second surname group distinguished here consists of names initially reserved for the ‘clergy’ of the Church of Sweden. Over time, this group broadened and its names became associated with a broader ‘educated’ status group; those with higher educational degrees were seen as *ståndspersoner* by their nineteenth century contemporaries (e.g. Fahlbeck 1892). In the analysis these ‘educated’ names are separated into three distinct subgroups: Latinized (-us) and Greek (-ander) names were commonly adopted during the sixteenth and seventeenth century. Subsequently, French-sounding names (e.g. -ell, -ér, -én) became more fashionable and the adoption of such French-sounding names was still common among the educated in the late nineteenth century. Between 1880 and 1950, new bearers entered the group of French-sounding names, while there was little change in the size of the Latinized and Greek-sounding surname groups.⁶⁰

This ‘educated’ status group, together with the nobility, formed a pre-industrial aristocracy in Sweden; education was relatively expensive and mostly reserved for children of the existing higher classes. The expansion of primary schooling in Sweden started early, with important legislation in 1842 aimed at creating a primary school in each parish nation-wide and ensuring teachers’ education (e.g. Westberg 2019). Despite this, secondary or tertiary education were indicators of high status among our study sample at least until 1960. With the expansion of the welfare state in the middle of the twentieth century, higher education became available to increasing shares of the population. Despite the 1842 legislation, actual expansion of educational attainment during the late nineteenth and early twentieth century had been slow due to lack of public funding and limited public support. Consequently, for men in our sample until 1960, most of the educational expansion was in the form of expansion and equalization of primary schooling, while expansion of secondary and tertiary education did not become quantitatively important until after 1970 (e.g. Ljungberg and Nilsson 2009).

This means that we observe most of the introduction of mass schooling and the entire subsequent expansion of secondary and tertiary education in the cohorts studied between 1820 and 1985. Once education became widely available, we may expect lower intergenerational persistence among the ‘educated’ and ‘noble’ surname groups, as a larger share of individuals from lower status backgrounds became qualified for high status occupations (cf. Meghir and Palme 2005).

⁶⁰ Surname adaptation was largely unregulated in Sweden up until 1901, when surnames became fixed. It was not until a sequence of legislative changes in 1919, 1920, 1921 and 1922 that adoption of existing surnames became restricted. Only noble surnames were somewhat protected under earlier legislation from 1626/1707 (see further Linde 2003). Even during the 1920s-1950s, adoption of new ‘designated’ surnames was common (see e.g. Hedberg 2019 and his ongoing work).

Moreover, between 1932 and 1976, Sweden continuously had social democratic governments who created and expanded the welfare state. These governments gradually increased progressive taxation and redistribution (see e.g. Magnusson 2000), which is often assumed to increase social mobility by reducing differences in parental assets that can be invested in children. Other policies to reduce the dependence of children's wellbeing and opportunities on their parents' economic resources were also implemented during these decades, such as universal benefits (e.g. child allowance and free school meals), and the abolishing of fees for higher education (see e.g. Breen and Jonsson 2007).

The third group of geographic 'bourgeois' surnames includes names originally primarily adopted by the (petty) bourgeoisie (artisans, merchants and similar). These names generally consist of two geographic elements referring to natural locations such as hills, trees, rivers or plants (e.g. Lindberg), but may also contain heraldic elements or geographical references to the area in which a family lives or used to live. Patronymy (e.g. Eriksson) form a fourth group. During medieval times, virtually all Swedes bore proper patronymic names (father's first name plus son or daughter). These names were abandoned by higher status groups, while they remained in use and became fixed among the broad majority of farmers and laborers. In the twentieth century, the adoption of fixed family names had become the norm (and was also encouraged in name laws from 1901). The number of families bearing patronyms gradually declined over the course of the 1880-2016 period, both as these families changed surnames more often than other groups, and as they emigrated to North America.⁶¹

We observe ancestor 1950 surnames rather than individual surnames for the 1960-2016 population.⁶² This means that we only observe intergenerational transmission of ancestral surname status and not effects of surname connotation. By assigning surname groups through intergenerational links rather than observed names, we avoid any biases in surname status persistence caused by changing of surnames by more mobile individuals for the years of 1950-2015.

⁶¹ In each decade between 1880 and 1910, 4-7% of the Swedish population emigrated to the Americas (gross emigration rate by end of decade population). Between 1910 and 1930, decadal rates of emigration were still over 2%. Transatlantic migration was more common among rural workers and those with farming origins, who often bore patronymic names (e.g. Ljungberg 1997). Until 1930, immigration to Sweden consisted largely of return migrants from the Americas. It was only during the Second World War that other forms of immigration become non-negligible. Generally, low immigration resulted in all Swedish surname groups until 1950 mostly being composed of Swedish-born individuals, including the 'rest' category.

⁶² Individuals are assigned to the same surname group as their paternal grandfather, father, or themselves depending on which is the latest generation observed in 1950. Those born after 1950 with no registered father are assumed to belong to the same surname group as their mothers if they have a maternal ancestor in Sweden in 1950.

Remaining unclassified surnames belong to two groups: those names which appear in the historical 1880-1950 census data not classified as 'educated', nobility, or bourgeoisie, or patronymic names that are diverse and consist of, among others, 'soldier', other geographical, German-sounding, French-sounding and other foreign (e.g. Polish, Finnish) or minority (e.g. Sami) names.⁶³ However, beside such minorities this 'rest' category primarily consist of newer and more unconventional high status names adopted during industrialization. We also group together all those since 1960 for whom we do not observe an ancestral surname in 1950. This group expands over time and consists predominantly of immigrant names.

In appendix table A.1, we present the distribution of men aged 30 to 60 over surname groups for the period of 1880-2016. In appendix table A.2, we present the average number of bearers of individual surnames in each surname group. Surname groups made up of common surnames are less indicative of direct family links than surname groups containing rare surnames. The big surname groups of patronymic and geographic surnames consist mostly of frequent surnames, with on average over a thousand male adult bearers for individual surnames contained in this group in each census year. The traditionally elite surname groups (nobility and 'educated') have the fewest bearers for each surname contained in them.

⁶³ In earlier versions of this paper, another surname group with soldier names was distinguished (e.g. Tapper, Dolk). In the eighteenth and nineteenth centuries, all soldiers received names upon entering an army division. These names were retained by many soldiers and became common as fixed surnames (e.g. Wahlberg 1990a, 1990b). At the same time, it was common for such names to be transmitted between subsequent soldiers inhabiting the same soldier farm – without biological relations. Many soldier names were similar to the group of geographical surnames. However, a subset of such names can be distinguished as these refer to military objects or (un)desirable personality traits in a military context. This group – as patronymic surnames – has low social status historically, but unlike patronymic surnames, soldier names had relatively low numbers of bearers per name. However, as these names can be either family names or location names, we have chosen to exclude them. In line with the literature, the high share of those with the occupation of soldier among men bearing soldier names in the nineteenth century also suggests that these names were attached to a location ('soldattorp') rather than a family in many cases.

Data and Methods

Data and analytical sample

We use historical census data (1880-1950) together with official register data from censuses and population registers (1960-2016). The historical censuses of 1880, 1890, 1900 and 1910 cover the full population (4.6-5.6 million individuals). These censuses were not the results of traditional enumerations, as in for example the United States, but based on continuous parish registers maintained by the Lutheran state church. Every decade priests created excerpts of their continuous parish registers. Enumeration was therefore not dependent on the numeracy and literacy of the population. The censuses include individual information about, e.g., sex, age, family relations, birth parish and county and current place of residence (Swedish National Archives 2011a, 2011b, 2014, 2016).

The 1950 census is based on the poll-tax register, an end-of-year summary of information on individual residents kept by the county administrations. Similar to the historical censuses, the 1950 census includes individual characteristics such as sex, age, birth parish and county and current place of residence. It also includes detailed information on places of residence in preceding years. Individuals are linked to their spouses and their children under the age of 17.

The contemporary register data are from the Swedish Interdisciplinary Panel (SIP), a compilation of different official registers and censuses starting in 1960.⁶⁴ We link individuals in SIP to their 1950 ancestor surname using unique personal numbers, introduced in 1947. The panel covers individuals and their parents born from 1932 to 1985, but coverage is increasingly limited for cohorts born before 1935.⁶⁵ Self-reported information on individuals' occupations is recorded in the censuses of 1960, 1970, 1975, 1980, 1985 and 1990, while annual employers' information on individuals' occupations is recorded from 2001 to 2016 in occupational registers reflecting current employment.

The occupational registers have some limitations in terms of coverage. They miss most individuals in project employment, non-salaried owners/proprietors and those

⁶⁴ In this study, we mainly use data from Statistics Sweden: the multigenerational register, the register of the total population, the censuses and the occupational registers. SIP is maintained by the Centre for Economic Demography, Lund University (PI: Jonas Helgertz)

⁶⁵ For those individuals born 1940-1985 the share of all individuals recorded in the multigenerational registers is more or less constant at or above 80%. That is, for each of these birth years 80% of all ever observed personal numbers with the same birth year can be linked to the multigenerational register. Additionally, for the first birth cohorts information on some parents is missing as some parents were never registered in Sweden after 1947 (when personal numbers were introduced), or passed away before 1961. For a more detailed description of those included and excluded see SCB.se.

working in small businesses (self-employed or one employee). These entail occupations such as consultants (high-status) or small shop-owners (low status). In general, coverage is better for the public than private sector and therefore better for women than men (see [SCB \(2011\)](#)). These limitations especially concern those working in high- and low-status occupations.

The sample studied consists of all men aged 30 to 60 observed in the respective censuses or registers.⁶⁶ We limit the study to men since the inclusion of women would lead to further important research questions on labor force participation, assortative mating, maternal and paternal surnames, which cannot be studied within the scope of this paper. Most importantly, surname status persistence of women cannot be captured in the same way as that of men over the entire period due to low (observed) female labor force participation until the mid-twentieth century, especially in those aged 30-60 and among mothers (e.g. Stanfors and Goldscheider 2017). This does mean that we observe an increasingly small part of the full workforce, as female labor force participation increases substantially over the twentieth century, especially around 1970. Our results may not generalize to working women.

Sample selection changes somewhat over time. The 1960 SIP sample is restricted to men aged 30-60 who are registered as fathers to individuals appearing in the panel.⁶⁷ This means that our sample in these years excludes some migrants and all childless men. Therefore, changes between the 1950 full population sample and the 1960 sample should be interpreted with caution. The data in 1960 and afterwards further differ substantially from the 1880-1950 data, as they do not include information on detailed occupational titles, but only contain aggregated occupational codes. Hence, we disregard the 1950-1960 period when measuring surname status persistence. In the years 2002, 2010 and 2015, we again observe all men aged 30-60 and our sample is defined in the same way as in the years 1880-1950.

Measuring social status

The social status of a surname or surname group is measured by occupational status scores on a continuous scale. Occupation, rather than education or earnings, is commonly used in historical studies of intergenerational mobility. There are practical reasons for this. Historical income data in Sweden are derived from taxation registers and are only available above a certain threshold, leaving variation

⁶⁶ We use cross-sectional data for the following benchmark years: 1880, 1890, 1900, 1910, 1950, 1960, 1970, 1980, 1990, 2002, 2010, 2015.

⁶⁷ This means that for men aged 30-60 living in Sweden in 1960 to be included, they have to have at least one registered child born after 1931 who has ever lived in Sweden.

among the rest of the population unobserved. Moreover, no comprehensive income register is available before 1968 (for a comparison of social class and income mobility before 1968 in a regional sample, see Dribe and Helgertz 2016).

Educational attainment was low among adults in Sweden for our first benchmark years. Men aged 30-60 had, on average, only an equivalent of one completed year (by contemporary standards) of formal schooling in 1880 (Ljungberg and Nilsson 2009). Thus, both education and income measures provide little in terms of variation for a majority of the population in the beginning of the period under study. Moreover, occupations can be considered a more stable measure of socioeconomic status when working with cross-sectional data, as occupations vary less over the life-course than income (e.g. Kalleberg and Mouw 2018; Nybom and Stuhler 2016).

In the 1880, 1890, 1900, 1910 and 1950 censuses, occupational information is recorded as occupational strings, which have been coded into HISCO (Leeuwen, Maas, and Miles 2002) by the SwedPop project (www.swedpop.se). Using occupational strings, these HISCO codes were matched to the official occupational coding used in the 1960-1990 censuses and 2001-2016 occupational registers (NYK-78, NYK-83; SSYK-96, SSYK-2012).

The Swedish censuses in 1960-1990 contain occupational codes based on the Swedish NYK-78 and NYK-83 codes, and a variable indicating socioeconomic status (SEI, Statistics Sweden 1982, 1989). We use a new translation key created by Dalman (Dalman 2022b) to link each NYK-78 + SEI combination to a HISCO code. Compared to the key to ISCO-88 developed by Erik Bihagen (Bihagen 2007), this conversion places greater emphasis on hierarchical differences and differences in skill level, and facilitates a direct conversion to the occupational status scale (HISCAM) and social class scheme (HISCLASS) used in the analysis (Lambert et al. 2013; Van Leeuwen and Maas 2011).

The occupational registers are coded using SSYK-96 and SSYK-12 (Statistics Sweden 1998, 2012), which are highly similar to ISCO-88 and ISCO-08. We convert SSYK to HISCO through ISCO-88 and ISCO-68 using Bihagen's (2007) keys. These conversions are unproblematic. However, occupational information is missing far more often in the annual occupational registers than in the historical and modern censuses, partly as it reflects actual current employment rather than self-identified occupation.

We use these matched codes to define occupational status and social class in a consistent manner over the period under study (1880-2016). Because they distinguish skill levels, historical social class and occupational status schemes are better able to capture meaningful aspects of social stratification over the long term, and likely even in modern Swedish society, than modern occupational class schemes (for the relevance of skill level, see e.g. Tåhlin 2007).

We rank occupations according to status using HISCAM, a historical status scale based on the contemporary Cambridge Social Interaction and Stratification (CAMSIS) scale (Prandy and Lambert 2003). The scale captures social distances using interpersonal relationships and is derived using over a million such relationships as represented in marriage certificates covering the period 1800-1938 and originating from seven countries, including Sweden (Lambert et al. 2013). The ranking of occupations is based on intergenerational occupational mobility between brides, grooms and their parents and parents in law, as observed on these marriage certificates. Thus, social stratification as conceptualized by HISCAM emphasizes social interactions between occupations rather than the more direct working conditions or employment relations (as reflected by social class). Occupational status reflects only the hierarchical dimension of social stratification, whereas social class reflects multiple dimensions of stratification – including sectoral change, skill level, level of supervision, and the manual/non-manual divide.

We use the universal male version of HISCAM (HISCAM_u2), as the Swedish version of HISCAM is based on rather few observations. HISCAM values theoretically range from 1 to 99 and are constructed to have a mean of 50 and standard deviation of 15 in a nationally representative sample in an industrialized country in the nineteenth and early twentieth century. Farming occupations have HISCAM values close to 50, while values above 70 generally reflect non-manual occupations. Elite occupations such as lawyer, engineer, or physician have the maximum HISCAM value of 99. In figure 1(b) a histogram of the HISCAM distribution in our analytical sample is shown. HISCAM ranges between 39 and 99 in our data and frequent occupations have HISCAM values between 45-55.

The HISCAM scale is suitable for the study of overall social stratification over a long period with major structural transformations. The distribution of social classes changes substantially over time, with initially elite classes becoming broad middle classes and the initially largest class of farmers virtually disappearing over time (Dalman 2022b). Such changes result in Lorenz curves based on social class being defined on different aspects of social stratification historically as today (e.g. being elite vs. belonging to a broad middle class). Its granular nature makes HISCAM better suited to capture similar aspects of social stratification in such different societies as Sweden in 1880 and 2016. Moreover, we can only calculate the informational content of surnames using a continuous status metric with quantifiable distances between groups. Thus, in the main analyses, all results are based on HISCAM. To make measurements more consistent over time, we use the highest HISCAM value over a three-year period for each benchmark year after 2001. For example, the 2010 HISCAM is based on observed occupations in 2009-2011. Results on surname status inequality and surname status persistence in terms of social class, using the HISCLASS scheme (Van Leeuwen and Maas 2011), are presented in the appendix (table A.3-A.4, figure A.4-A.6).

Measuring the informational content of surnames

We estimate the informational content of surnames (ICS) at the individual surname and surname group level. The ICS is defined as the difference between the R^2 from a regression of actual surname-group dummy variables on individuals' HISCAM values, and the R^2 from a regression of "placebo" surname-group dummy variables on individuals' HISCAM values (Güell, Rodríguez Mora, and Telmer 2007; Güell et al. 2015; Santavirta and Stuhler 2021): $R^2 - R_p^2 = ICS$. Placebo surname-group dummy variables are created by assigning random surname groups to every individual in the sample, while maintaining the actual distribution of surname groups over the population, i.e. "reshuffling" surnames.⁶⁸

The R^2 across the population from a regression of actual surname-group dummies on individuals' HISCAM values shows the share of variation in occupational status between individuals that can be explained by surname groups. This can reflect either traits shared by surname-group members, or variation explained by separating subgroups of individuals irrespective of shared traits. To discount the latter, the ICS is defined as the *difference* between this R^2 and the R^2 of a regression of placebo surname groups. The R^2 for placebo surnames will automatically be higher if we have more unique surname groups, in particular if we have many unique surname groups among individuals with high variation in occupational status.⁶⁹

Our main ICS analyses are based on a subsample of men aged 30-60 holding surnames with at least 10 bearers in each respective census year. We conduct alternative analyses with different surname frequency subsamples to see how surname frequency affects the ICS estimates. We reiterated surname "reshuffling"

⁶⁸ The placebo surname groups are assigned as in the following example: assume we have a sample of 100 individuals with the surnames A (10 persons), B (5 persons), C (50 persons) and D (35 persons). Surname A and C belong to surname group AC and surname B and D to surname group BD. We then assign group BD to 40 random individuals, group AC to 60 random individuals, surname B to 5 random individuals, etc. If we want to analyze the ICS within surname group BD we assign surname B to 5 random individuals within group BD. If we want to analyze the ICS of individual surnames in the full sample we assign surname B to 5 random individuals in the full sample.

In subsamples of the population, this name "reshuffling" process must be reiterated to generate reliable ICS estimates (Santavirta and Stuhler 2021), and the number of reasonable reiterations is negatively associated with the size of the subsample. To get a reliable ICS metric in a smaller subsample of the population (such as those bearing noble surnames), we must reiterate the generation of placebo surnames a larger number of times. In a big subsample, no or few reiterations are necessary to generate reliable ICS metrics. Because individual surnames are nested in surname groups, we can estimate the ICS of individual surnames within each surname group. To do so, we reshuffle individual surnames within surname groups 100 times and derive ICS estimates with confidence intervals from these iterations.

⁶⁹ An extreme example of the difference between the ICS and R^2 is given by 100 unique surnames in a sample of 100 individuals. Then the ICS will be zero while the R^2 of regressing surname dummies on occupational status would be one.

for our full population samples but for such large samples, confidence intervals are negligible. Therefore, we only present confidence intervals for ICS estimates within surname groups.

The ICS can be biased if surname group belonging is associated with demographic and geographic characteristics that also affect occupational status (omitted variable bias). We therefore also estimate the ICS with models controlling for age, marital status, migrant status, birth county and family size. This set of control variables makes our results comparable to Santavirta and Stuhler (2021; they did not control for marital status) and Güell et al. (2015; they also controlled for country of birth).

Measuring surname inequality and persistence

Surname group status at one point in time can be summarized using relative representations of some indicator of social status within different surname groups (see e.g. Clark et al. 2015, p. 9). Indicators of social status can be elite positions or for example social classes. Relative representations of surname groups in status indicators are calculated as the ratio between the share of a surname group in a status indicator and the share of the total population in the same status indicator:

$$\frac{n_{x,y} / \sum_y n_{x,y}}{\sum_x n_{x,y} / \sum_{x,y} n_{x,y}} = \frac{n_{x,y} / \sum_x n_{x,y}}{\sum_y n_{x,y} / \sum_{x,y} n_{x,y}}$$

with x subscripts referring to surname groups and y subscripts to status indicators. In this study, surname group status is measured across the social structure of a society by using the relative ranking of individuals within surname groups on a continuous occupational status scale (HISCAM).⁷⁰ This measure is most intuitively summarized by a Lorenz curve, which plots the occupational status of the full population at increasing percentiles on the x-axis against the occupational status of a surname group Z at increasing percentiles on the y-axis (see figure 2). If A_z depicts the area between such a line plot for the full population (i.e. the area under a 45 degree straight line) and a line plot for surname group Z, and B_z depicts the area under such a line plot for surname group Z, then the “Gini” coefficient for surname group Z is given by the ratio of areas under these line plots:

$$G_z = A_z / (A_z + B_z)$$

⁷⁰ Relative to the full population. As we use rank transformations of occupational status, this measure is not only valid when status is normally distributed with constant variance and does not require the surname groups to have the same within-group variance of status as the full population, in contrast to estimates that do not use the full population, but instead one indicator of status (as e.g. in Clark 2012 for Sweden).

This is visualized in figure 2 for a surname group Z (patronyms).⁷¹ In the case of a lower status surname, the occupational status at each percentile of the surname group status distribution is lower than or equal to the occupational status at the same percentile of the full population. Thus, the area A_Z given by the Lorenz curve for surname group Z will be below the diagonal.

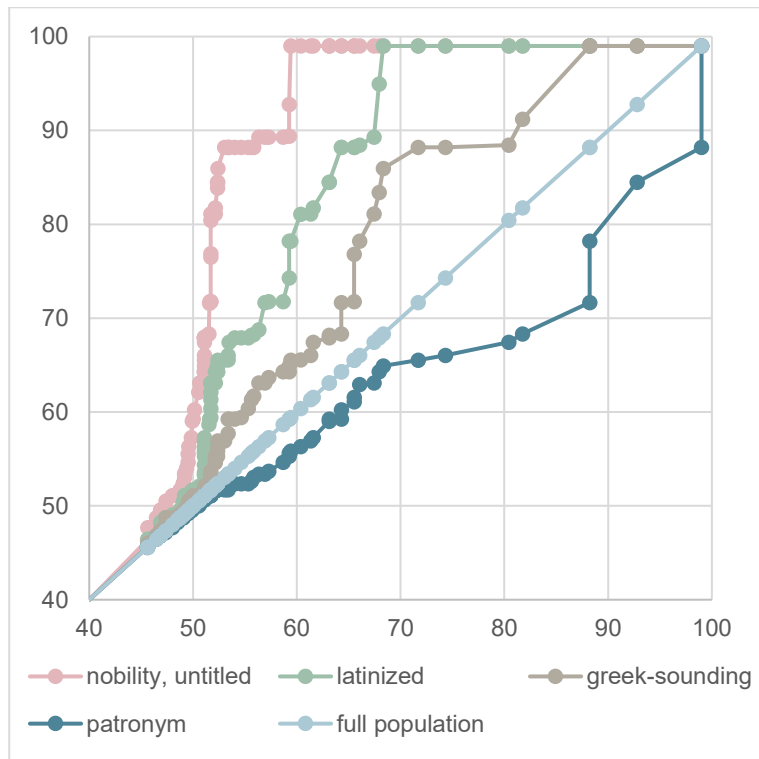


Figure 2 Lorenz curves by surname group. Swedish-born men aged 30-60 in 1950.

Theoretically, ‘heterogenous’ surname groups would also be possible, who have higher status variation than the overall population and are overrepresented both in some low- and some high-status positions. In that case, the area A_Z for this surname group would be partly above and partly below the diagonal. If our surname groups would not indicate either high or low status positions, we would expect their curves to cross the diagonal. For surname groups that are distinctly high or low status, where crossing the diagonal does not happen, we can calculate “Gini” coefficients. In practice, our surname groups based on pre-industrial social stratification are

⁷¹ There exist several formal representations of the Gini coefficient, the geometric representation is chosen here as the most intuitive. See e.g. (Eliazar 2018; Frosini 2012) for other formulations.

distinctly high- or low-status in Sweden across the period 1880-2016, which means that this theoretical constrain has little practical relevance here.

Changes over time in surname group status relative to the full population are evaluated as ‘surname status persistence’, or group-level intergenerational persistence. Surname status persistence resembles intergenerational correlations under certain conditions. In particular, when using surname groups, only mobility processes between surname groups, not within, are captured (Güell, Rodríguez Mora, et al. 2018; Torche and Corvalan 2018). If surname group status of at least two generations is known, then surname status persistence is defined as b in the estimated equation:

$$\bar{x}_{zt} = \bar{x}_{z0}b^t$$

assuming that intergenerational mobility has the form,

$$\ln(\bar{x}_{zt}) = \ln(\bar{x}_{z0}) + \beta \cdot t + \bar{\varepsilon}_z$$

where t is time in generations, z is an index of surname groups, the estimated ‘intergenerational correlation’ $\hat{\beta} = \ln(b)$, \bar{x}_{zt} is surname group status of surname group z in generation t , and \bar{x}_{z0} is surname group status of surname group z in the first observed generation.⁷² In this simple model, surname group status of surname group z is assumed to converge to the population mean ($\mu=1$) exponentially.⁷³ If estimated using relative representations for \bar{x}_{zt} , constancy in status variation over time is required for b to be interpretable as a correlation. If a society’s social mobility is estimated using one surname group, then for the estimate to be interpreted as overall social mobility variation in status may not differ by surname group. Compared to conventional measures of intergenerational mobility, these modelling constraints are especially stringent. To estimate intergenerational elasticities, the following equation is estimated:

$$\ln(x_{it}) = \alpha + \beta \cdot \ln(x_{it-1}) + \varepsilon_i$$

⁷² The b -estimate is assumed to be biased as any measurable status x is imperfectly correlated with “underlying social competence” (Clark et al. 2015). However, Clark assumes that the estimate is consistent for surname groups, but not in individual-level estimates. That is, $Exp(\bar{\varepsilon}_z) = 0$ if the surname group z is sufficiently large, but $Exp(\varepsilon_i) \neq 0$ for an individual i .

⁷³ This implies that mobility where a surname group becomes more overrepresented or underrepresented (divergence) leads to b -estimates larger than one; ‘intergenerational correlations’ larger than one. Mobility within a surname group resulting in the same summary measure of surname group status (i.e. same “Gini” or same relative representation) in generation $t + 1$ as in generation t result in an ‘intergenerational correlation’ of exactly one. We do not refer to this metric as a correlations but rather as surname status persistence.

with i indexing individuals, a referring to the difference in the population-average of status between subsequent generations, and ε_i referring to factors influencing social attainment of the offspring other than the parent (see e.g. Björklund & Jäntti, 2009). Instead of *assuming* permanent regression to the mean of entire surname groups, and no changes in variation, intergenerational elasticities are by design restricted to be in the range $[-\sigma_{i+1}/\sigma_i, \sigma_{i+1}/\sigma_i]$ with σ_j the standard deviation of parent or child income. Thus, elasticities can be transformed into correlations in the range $[-1,1]$ by multiplying with the ratio of parent to offspring standard deviations (Björklund & Jäntti, 2009).

In our case, we estimate surname status persistence b using data spanning the period 1880-2016. For simplicity and comparability with Clark's estimates (e.g. see Clark et al. 2015, appendix A), we assume a length of 30 years for all generations (i.e. children are on average born when their father is aged 30 in each birth cohort). Hence, ten-year intervals represent one-third of a generational change, while forty years represent four-thirds of a generational change.⁷⁴

⁷⁴ Note that if we assume generational intervals to be of another length, then our implied surname status persistence will change accordingly. If, for example, generations are on average 25 years, surname status persistence would automatically be somewhat higher. Persistence b with 25- respectively 30-year intervals relate to each other in the following way, where t is time in years:
 $(\bar{x}_{zt}/\bar{x}_{z0})^{25/t} \sim (\bar{x}_{zt}/\bar{x}_{z0})^{30/t}$

Results

Latent factor or group-level intergenerational persistence?

High surname status persistence has been suggested to either be related to measurement error and ‘underlying social competence’ or group-level processes (Santavirta and Stuhler 2021). We provide suggestive evidence of an important role for the latter; the informational content of a small number of Swedish surname groups is about half as large as the informational content of 5,000-8,000 individual surname dummies (see table 1 and figure 3). Moreover, mobility is higher within surname groups reflecting pre-industrial social stratification than in the full population (see figure 4).

The share of the informational content of surnames that can be attributed to this small number of pre-industrial social strata cannot capture actual family lineages; the surname groups are far too coarse for this. It rather captures a form of broader group belonging that is transferred from one generation to the next, akin to ethnicity. We find that group-level processes of intergenerational transmission account for much of the intergenerational persistence in terms of surnames; in terms of intergenerational mobility outcomes there exist meaningful boundaries in social space at the level of pre-industrial social strata.⁷⁵

The more specific results leading to this general finding are discussed in the result sections on the informational content of surnames. A discussion of the importance of surname rarity for the informational content of surnames, and our choice of surname frequencies included in the main analyses, can be found in the appendix. As we empirically observe such an important role in intergenerational persistence for these pre-industrial status groups reflected by surname type, we show surname status inequality and surname status persistence of these status groups in more detail and across time in the result sections on surname status inequality and persistence.

Informational content of surnames and surname groups

We estimate the informational content of surnames (ICS) at the individual surname and surname-group level. The ICS at the individual surname level is 0.109 in Sweden in 1880, and 0.008 in 2010. After controlling for demographic and regional characteristics, it is slightly reduced and lies in the range of 0.005-0.096. The ancestral surname ICS declines substantially from 1880 to 2010, to negligible levels.

⁷⁵ The between-group proportion of the population variance in occupational status is relatively low. We combine this finding with the observed high group-average surname status persistence, relatively high group-level ICS (half of surname-level ICS), and generally observed low individual-level intergenerational coefficients in the Swedish context. Together, these suggest that surname group effects are substantial. For a formal derivation of within-group and between-group mobility, see Borjas (1992) or Güell et al. (2018).

This partly reflects increasing intergenerational mobility at the individual surname level. It likely also reflects that name changers, and thus new surnames not observed here, define much of the ICS (as suggested in Güell, Rodríguez Mora, and Telmer 2015). However, increases over time in occupational status variation are another contributing factor to the decreasing share of variance explained by individual surnames.⁷⁶

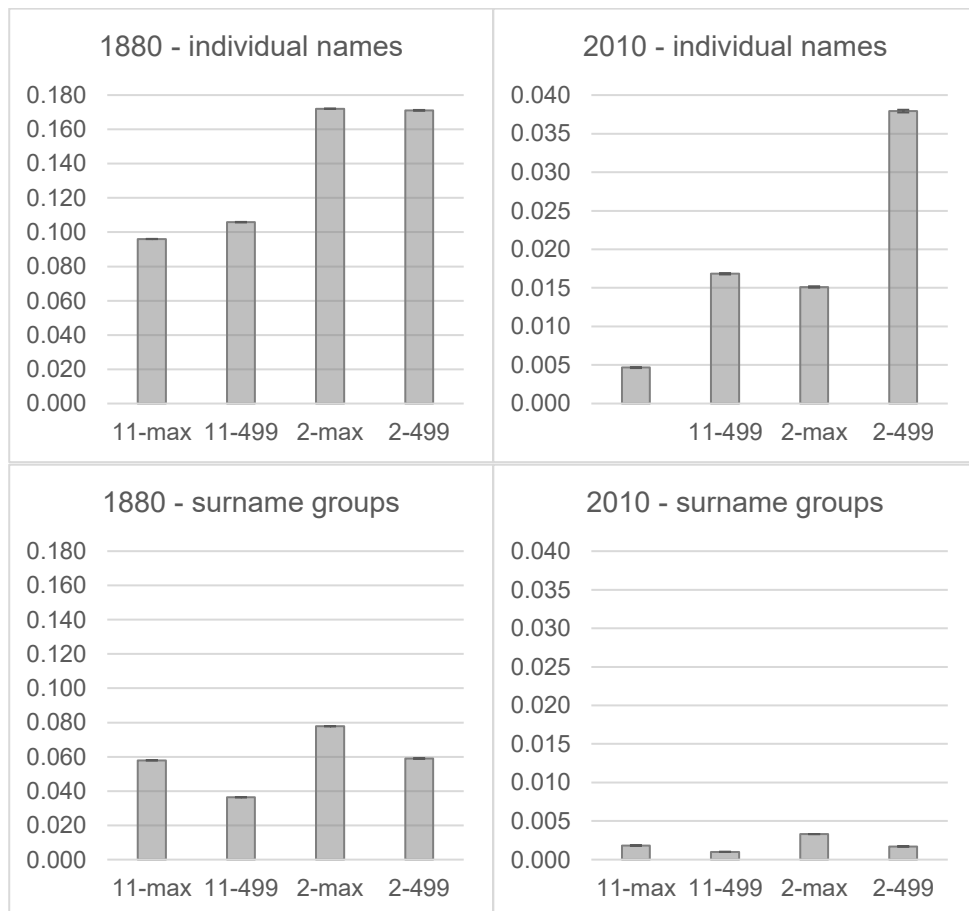


Figure 3 ICS by surname rarity. ICS(2) with controls and sample as in previous figures, using different surname frequencies: > 10 bearers, 11-499 bearers, >1 bearers; 2-499 bearers.

⁷⁶The overall variance in occupational status as measured through HISCAM increases substantially in Sweden from 1880 to 2010. In 1880, the standard deviation of HISCAM in our sample is 7.37, compared to 14.8 in 2010.

Table 1 Informational content (ICS) of surname groups and individual surnames⁷⁷

		ICS (1)		ICS (2)				
Surname dummies		Yes		Yes				
Demographic and regional controls				Yes		Nr. of surname (groups)	Nr. of individuals	Share of variance
		R² (1)	ICS (1)	R² (2)	ICS (2)			
Surname group	1880	0.063	0.063	0.084	0.058	9		0.6
	1910	0.046	0.046	0.06	0.045	9		0.56
	1950	0.023	0.023	0.051	0.019	9		0.39
	1960	0.016	0.016	0.053	0.015	10		0.49
	1990	0.008	0.008	0.041	0.004	10		0.42
	2010	0.010	0.010	0.045	0.002	10		0.39
Individual surname	1880	0.115	0.109	0.128	0.096	4,947	574,869	
	1910	0.093	0.086	0.102	0.079	7,192	710,986	
	1950	0.065	0.060	0.086	0.050	6,421	1,222,030	
	1960	0.044	0.038	0.076	0.031	5,387	808,375	
	1990	0.024	0.016	0.057	0.010	7,556	1,044,344	
	2010	0.017	0.008	0.058	0.005	7,922	1,126,901	

We can compare the individual-level ICS to previous studies using a similar metric. As the ICS is monotonically increasing with intergenerational status persistence in comparable contexts, this comparison should reflect levels of intergenerational persistence. Swedish ICS levels, as presented in table 1 and appendix figure A.1, are lower than the ICS estimates found in Santavirta and Stuhler (2021) and in Güell et al. (2015). However, these studies include more rare surnames than our main estimates and the individual surname ICS decreases by surname frequency (see Santavirta & Stuhler 2021, figure 2 and Güell et al. 2015, figure 4). Moreover, we have a larger sample size than most other estimates and the ICS (as based on R-

⁷⁷ ICS estimates are based on the difference between R^2 and R^2_{random} from regressing actual and random surname (group) dummies on individuals' HISCAM value. Sample: men aged 30-60 in each respective census, subsample holding surnames with at least 10 bearers. ICS from models with and without controlling for demographic and geographic differences: age, marital status (married/partner, divorced/widowed, never married, unknown), immigrant status, birth county, number of children/siblings. Last column gives the share of total variance in HISCAM explained by surnames (N=5,000-8,000) that is explained by surname groups (N=9-10). Number of observed individuals per census: 574,869-1,222,030. Note decreasing sample size from 1960, see data section for sample selection from 1960; this is partly related to the unavoidable exclusion of the "no ancestor surname" group from the analyses at the individual surname level.

squared) should be expected to decrease with sample size. In 1880, we find an ICS of 0.172 when including all surnames with more than one bearer in a model with controls (see figure 3). The comparable ICS for the IPUMS linked representative sample of 1880-1900 presented by Santavirta and Stuhler is 0.081. With the same sampling criteria and model, we find an ICS of 0.015 in 2010. This can be compared to an ICS of 0.0245 based on the 2001 Catalan Census as presented in Güell et al. If these contexts are comparable, it implies that intergenerational persistence in Sweden in 1880 was higher than in the 1880-1900 US, and persistence in Sweden in 2010 lower than in Spain in 2001. These findings are in line with conventional intergenerational mobility studies. However, direct comparisons of the ICS across contexts are only approximate.

We estimate the ICS at the surname group level to be 0.010-0.063 in models without controls, and 0.002-0.058 in models with controls (see table 1). Decreases in the ICS of surname groups are somewhat faster than decreases in the ICS of individual surnames, so that the group-level ICS is 60% of the individual-level ICS in 1880 and 40% of the individual-level ICS in 2010. Thus, a substantial share of the explanatory power of thousands of individual surnames for social status attainment is captured by a small number of surname groups, but this proportion slowly decreases over time.

As it is not possible to interpret the level of the ICS metric substantively, we present the expected HISCAM value and its interpretation for different surname groups in 1880 and 2010 from the above ICS(2) models in appendix figure A.2 and describe expected differences in occupational status for surname groups in 1880 and 2010 here. Surname group differences translate into an expected occupational status at the level of a farmer in 1880 for a man with a patronymic surname born in 1850 in the Stockholm region, married and living in a two-person household. A man with similar characteristics except for bearing a titled nobility surname would instead expect an occupational status at the level of bank teller. A similar man born in 1980 instead, and bearing a patronymic surname, could in 2010 expect an occupational status at the level of transport and communications supervisors. His peer bearing a titled nobility surname could instead expect to hold an occupation with the status of a writer. That is, the men born in 1850 and 1980 with nobility surnames hold occupations with similar occupational status, while the man born with a patronymic surname in 1980 has a much higher occupational status than his counterpart born in 1850. Absolute differences between surname groups are much lower in 2010 than in 1880, but still relevant. A more detailed description of surname status persistence at the level of surname groups is given in a separate section on this below.

Informational content of surnames within surname groups

We estimate surname-level ICS within surname groups to compare the contribution of individual surnames to status attainment within surname groups, to the contribution of individual surnames to attainment across the full population. If the

group-level ICS captures a substantial share of the informational content of individual surnames, we would expect intergenerational persistence – as indicated by the ICS – to be lower within surname groups than in the full population. We test this in a subsample with rare surnames (2-499 bearers), as rare surnames have the highest informational content (see appendix section on the ICS and surname frequency). If we find confirmatory results for rare surnames, then we can assume confirmation for the entire population. The results of this analysis are shown in figure 4, and results of a similar analysis with common surnames are shown in appendix figure A.3.

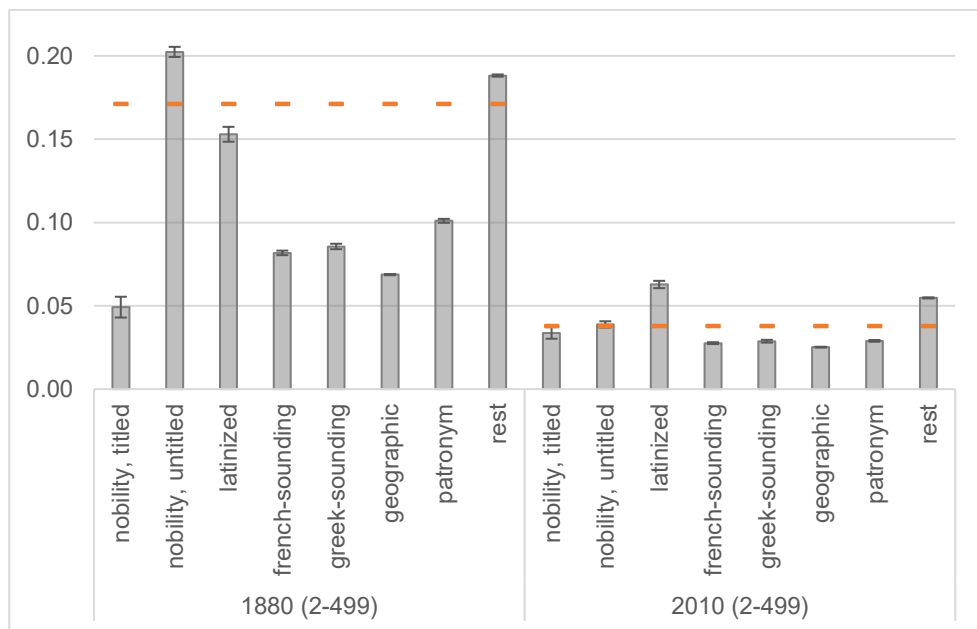


Figure 4: Informational content of individual surnames within surname groups.⁷⁸

Figure 4 shows that compared to the full population ICS of 0.171, the within-group ICS estimates in 1880 are lower for most groups even in the sample with rare surnames; within-group ICS estimates are about half the size of full population ICS estimates for most surname groups (titled nobility, French-sounding, geographic, patronyms). The within-group ICS is only higher for the ‘untitled nobility’ and ‘rest’ surname groups. The ‘rest’ surname groups should not be a homogenous group and

⁷⁸ Grey bars depict the ICS estimates based on individual surname dummies and randomly reshuffled surname dummies within each surname group, with surname dummies regressed on individual’s HISCAM value. Including controls for demographic and regional differences as in previous models (ICS(2)). Orange line depicts the full population ICS for the same sample. Sample: men aged 30-60 in each respective census, subsample holding surnames with 2-499 bearers. Number of observed individuals within a surname group ranges from 429 (titled nobility in 1880) to 151,517 (geographic in 2010). 99% confidence intervals for ICS estimation.

should therefore be expected to have a high within-group ICS. In 2010, we again see that the within-group ICS is lower than the full population ICS of 0.038 for large surname groups, except for the ‘rest’ and ‘latinized’ group. A low ICS within surname groups could reflect high occupational intergenerational mobility, but this is not necessarily the case (*cf. Dalman 2022*).

To ensure generalizability of these results to all surname frequencies, we compare these results among the rare surname subsample to the common surname subsample (shown in appendix figure A.3). This substantively gives the same results. In the subsample with common surnames, the full population ICS is much lower than in the subsample with rare surnames, and so is the within-group ICS in the surname groups where common surnames are the norm (geographical and patronymic names).

Surname status inequality

Our surname group typology is based on historical social status differences between surname groups, which arose over the course of centuries preceding the 1880-2016 period that we observe. Therefore, we first assess differences in occupational status between individuals in these surname groups as observed in 1880 to see whether these historical social status differences are reflected in occupational social stratification in 1880. Figure 5 shows the occupational social stratification of all surname groups in 1880, 1910, 1950, 1960, 1990 and 2010.⁷⁹

For a given surname group and a given percentile on the x-axis, the y-axis shows the HISCAM value for that surname group at that percentile. Surname groups are distinguished by colored lines. The more dispersed the colored lines are, the higher the surname status inequality in a given year. Surname groups with overlapping lines have a similar distribution of HISCAM values and thus a similar surname group occupational status. Surname groups that attain higher HISCAM values at a given percentile have higher occupational status, so the further the lines are to the left in the figure, the higher the occupational status of that surname group.

⁷⁹ Results in figure 4 are presented until 2010 rather than 2015 because the occupational registers have higher coverage for the years 2009-2011 than for the years 2014-2016. Time trends in other figures are shown for the full period 1880-2015. Over the years 2009-2011 we do not observe HISCAM for 21.2% of men aged 30-60 (either no observed occupation, no HISCAM match, or is in the labor force), over the 2014-2016 period, the respective figure is 33.4%. This difference is largely the result of missing 4-digit SSYK codes for 12.4% respectively 24.5% of men aged 30-60 in these years. Results for 2015 are available upon request from the first author.

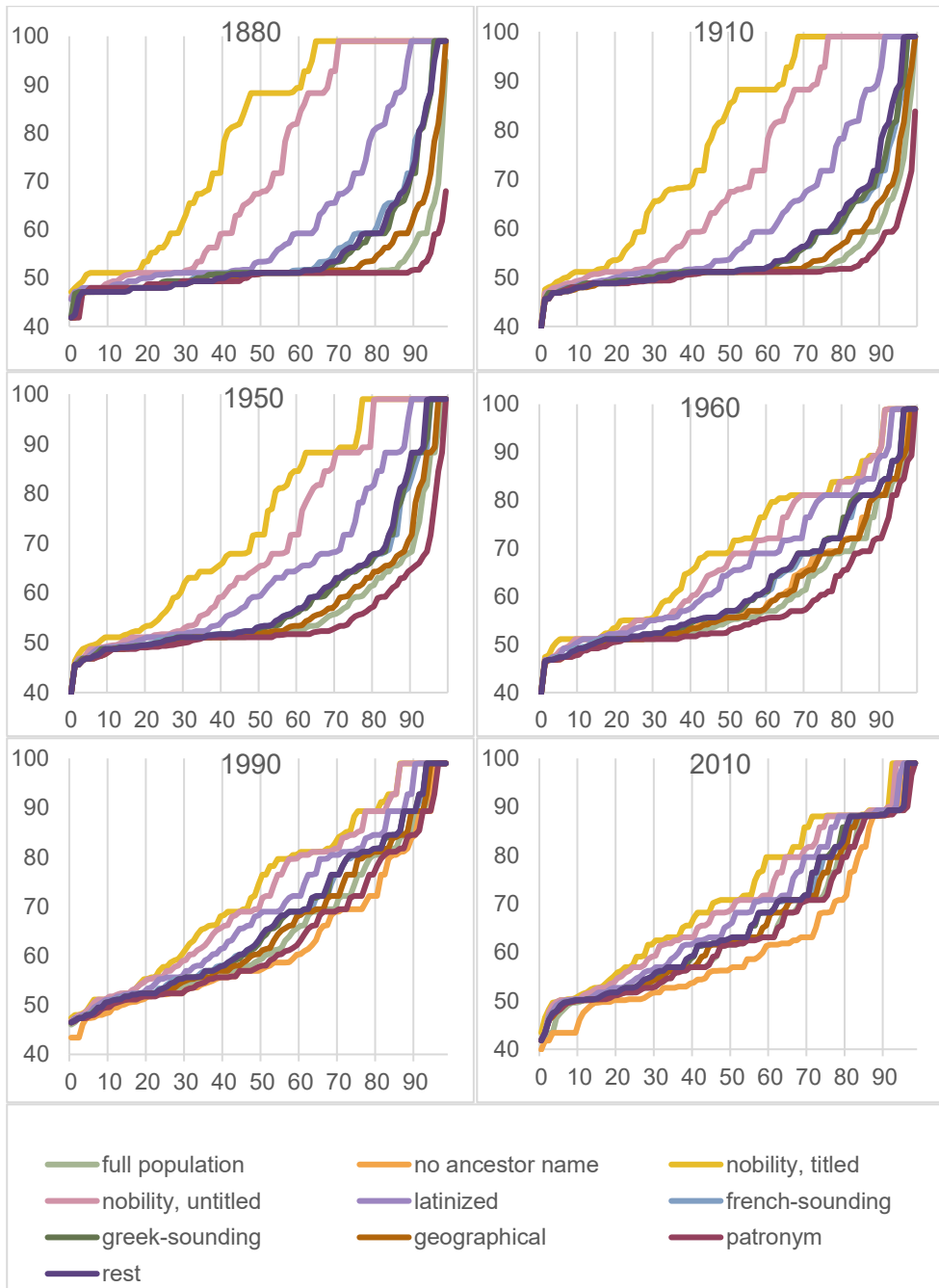


Figure 5 Occupational status distribution by surname group. HISCAM value (39-99) at each percentile for men aged 30-60, 1880-2010.

The figure shows substantial surname status inequality. Those bearing noble surnames are distinctly elite in terms of occupational status, with half of all men with noble surnames holding elite occupational positions held by less than 2% of all men (HISCAM value > 70). Latinized surname holders form another distinctly elite surname group. Bearers of Greek-sounding, French-sounding and ‘rest’ surnames have very similar high-status occupational distributions. In 1880, only one in three of them has a HISCAM value of 50 or below, having manual occupations ranked below farming. Individuals with patronymic surnames form a disadvantaged group, with less than a percent having high-status occupations (HISCAM above 70). Individuals with geographical surnames, traditionally the petty bourgeoisie, are slightly better off than the full population. Thus, occupational social stratification originating from pre-industrial status groups reflected by surname type was still highly salient in Swedish society in 1880.

Figure 5 shows that the relative (dis)advantage of surname groups persists over time; the ranking of surname groups in the 2000s is the same as that seen in 1880. One noteworthy change occurs in terms of the relative position of different surname groups; the increasingly large ‘surname’ group of immigrants (“no ancestor name”) observed since 1960 has an increasingly distinct low occupational status. This lifts the relative position of all other surname groups.

In terms of levels of surname inequality, differences between surname groups decreased gradually over time. These declines are partly a result of occupational upgrading of the non-elite surname groups; over time these groups attain higher HISCAM values at lower percentiles. However, we also see a marked change between 1950 and 1960 where substantially fewer bearers of elite surnames held elite positions. A similar change occurs between 1990 and 2010. The first abrupt change among the elite surname groups occurs as our data source shifts from occupational titles to occupational codes and likely overestimates the change in the position of the elite surname groups between 1950 and 1960.⁸⁰

From the distributions presented in figure 5, we generate Lorenz curves that are summarized using the Gini coefficient for each surname group and census year. To clarify the distinction between advantaged and disadvantaged surname groups, we depict the Gini coefficients of disadvantaged groups as negative values. These “Gini” coefficients are presented in figure 6. Gini coefficients are bounded by zero and one and our values thus by minus one and one. Thus, a coefficient close to one means that a surname group occupies nearly all elite occupations, while a coefficient

⁸⁰ Specifically, we do not observe military ranks in the 1960 and 1970 censuses: officers are given the same occupational status as common soldiers. Many of those with HISCAM 99 in elite surname groups in 1950 hold occupations as military officers – of which some are not reflecting actual elite status by the late twentieth century. Other common occupations that might not always reflect an elite position in 1950 but do receive HISCAM 99 are engineer, lawyer, and holder of a postgraduate degree; individuals appear to receive these occupational titles also by virtue of their degree rather than by holding an occupation as such.

close to minus one means that a surname group occupies nearly all of the lowest status occupations. A coefficient close to zero means that the occupational distribution of that surname group is representative of the population as a whole. In 1880, “Gini” coefficients range between -0.43 (patronymic) and 0.88 (titled nobility). A reduction in gaps between surname groups by 1950 result in a “Gini” range between 0.75 (titled nobility) and -0.26 (patronyms). By 2010, the “Gini” range is reduced to 0.28 (titled nobility) and -0.10 (no ancestor name). As in figure 5, we see that surname status inequality is much lower in the twenty-first than in the nineteenth century, while the relative ranking of surname groups remains constant throughout the period.

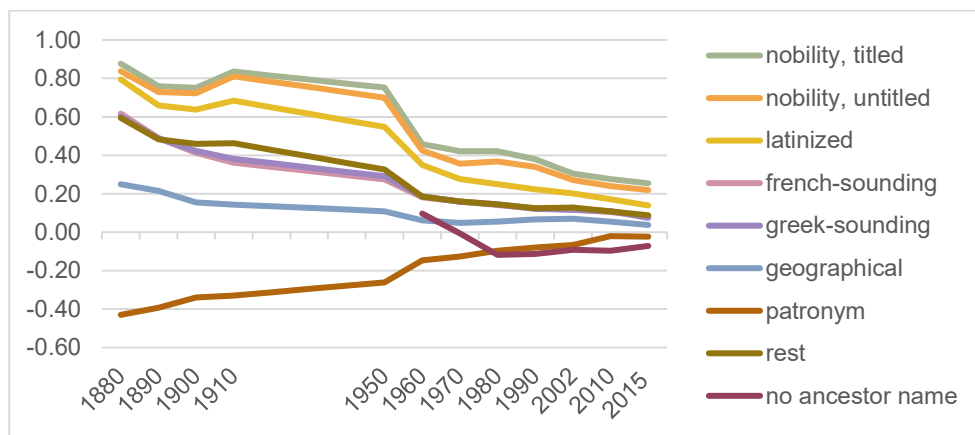


Figure 6 Surname group “GINIs”. The “Gini” coefficient for a surname group in a census year represents the deviation of that surname group’s occupational status distribution from the full population’s occupational status distribution, using HISCAM. Swedish men aged 30-60 in 1880-2016.

Thus, surname status inequality is an important dimension of social stratification in Sweden historically as well as today. Individuals bearing surnames with different social status origins in pre-industrial times still differ in their occupational status today, and their relative positions have remained unaltered. This is in line with Clark’s (2012, 2014) findings for elite surname groups and elite occupations, but expands his results to the entire Swedish population. It is also in line with historical research on status persistence of the Swedish nobility specifically (Almenberg and Dreber 2009; Bengtsson et al. 2019; Norrby 2005). At the same time, the level of inequality across surname groups has declined significantly since the early twentieth century.

Surname status persistence

In this section, we derive intergenerational rates of regression to the mean and absolute status persistence from the surname status inequality measures described

previously. As can be seen in table 2, we find substantially higher surname status persistence at the level of surname groups than would be expected from individual parent-child associations, in line with Clark’s (2014) social mobility estimates also using surname groups. Table 2 shows high levels of surname status persistence fluctuating around 0.8 across the surname status distribution and over time. From 1960 onwards, overall persistence decreases from 1880-1950 levels of around 0.8-0.9 to 0.5-0.7. Other factors, such as surname group size or rarity of surnames within a surname group seem irrelevant for levels of surname status persistence of surname groups, in contrast to their relevance in terms of the informational context of surnames.

Table 2 Surname status persistence. Implied intergenerational rate of regression to the mean using “Gini” coefficients for each surname group in each census year. Assumed intergenerational distance of 30 years. Methodology and data as described in main text.

	Nobility, titled	Nobility, untitled	Latinized	French-sounding	Greek-sounding	Geographical	Patronym	Rest	AVERAGE unweighted
1880-1910	0.96	0.98	0.89	0.67	0.71	0.66	0.82	0.83	0.88
1910-1950	0.92	0.90	0.85	0.82	0.82	0.81	0.84	0.77	0.90
1960-1990	0.83	0.80	0.64	0.68	0.65	1.08	0.54	0.68	0.68
1990-2015	0.62	0.59	0.56	0.61	0.56	0.51	0.23	0.66	0.54
1880-2010 excl 1950-1960	0.86	0.85	0.78	0.72	0.74	0.80	0.61	0.76	0.80

During the period 1880-1950 surname status persistence is high among traditionally disadvantaged and advantaged surname groups alike. From 1960 onwards, the traditionally disadvantaged surname group (‘patronyms’) converges to the population mean more rapidly than before. Their relative occupational status increases substantially with implied surname status persistence as low as 0.25-0.50. At the same time, we see the large surname group with geographical names diverging from the population mean by also attaining higher average status between 1960 and 1990 (1.08). These two phenomena are in part related to the same demographic event: inflow of migrant groups that after arrival occupied low-status positions to a much greater extent than the old surname groups with Swedish origins. The increasingly large group with “no ancestor name” became increasingly disadvantaged between 1960 and 1990 and remained so until 2015 (see figure 6).

Thus, native Swedes with patronymic names eventually lost their status disadvantage in society as low-status occupations became occupied by immigrants.

Figures 5 and 6 visualize a gradual convergence between surname groups over the period 1880-2016. Convergence occurs primarily through status upgrading in terms of occupational status of traditionally non-elite surname groups. If we examine this shift in more detail, we find that it is not only related to the inflow of migrants but also to the decline of the agricultural sector and growth of the non-manual classes. Occupations in the non-manual classes generally have a higher HISCAM value than those in the agricultural sector. In contrast to these major structural transformations, the share of the general population and large non-elite surname groups working in mostly industrial occupations with low HISCAM values (unskilled or low-skilled manual workers) has remained rather stable over time. For more details on the relationship between surname status persistence and structural transformations, see appendix (table A.3-A.4 and figure A.4-A.6) for surname status inequality and persistence in terms of social classes (HISCLASS) rather than occupational status.

In figure 7 we see absolute surname status persistence defined as changes in the share of individuals in each surname group with high and low occupational status, respectively. The pattern of occupational upgrading described above is apparent in these graphs; traditionally disadvantaged surname groups increase their share among high-status occupations more rapidly than elite surname groups, while their share among low-status occupations decreases more rapidly. The share of those with elite surnames occupying both high- and low-status occupations is remarkably constant over time; their status distribution in 1880 resembled the status distribution for the entire Swedish population in the 2000s.

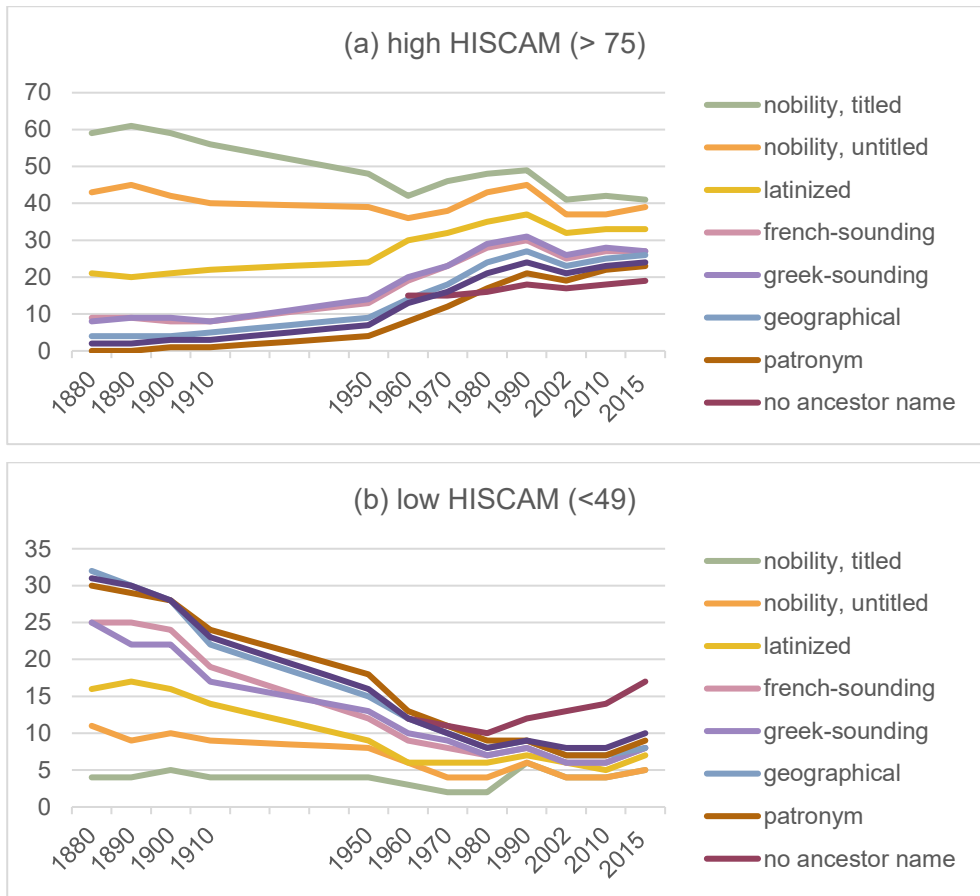


Figure 7 Surname status persistence among high- and low-status occupations: Share (in percentage) of individuals in each surname group with high (HISCAM > 75, figure a) respectively low (HISCAM < 49, figure b) occupational status in Sweden over the period 1880-2016, among men aged 30-60

Concluding discussion

We find high levels of surname status persistence in Sweden between 1880 and 2016, with implied intergenerational rates of regression to the mean around 0.8-0.9 over the period 1880-1950 and around 0.5-0.7 over the period 1960-2015. Persistence is high for initially disadvantaged as well as initially advantaged surname groups and throughout the occupational status distribution. While conventional parent-child associations imply that social origin is less important than all other factors combined, at the surname group level, descendants' average status differs little from their ancestors' average status. This discrepancy between surname group level and individual level intergenerational mobility challenges the common formulation of intergenerational social mobility as having the simple form of regression to the mean at the population level with – net of included controls – only random variation. This also means that we cannot interpret the intergenerational correlation from such modelling as depicting the share of variation in socioeconomic status that is due to family socioeconomic background, but only a lower bound of this share. In arriving at this conclusion, our results are in line with the broader mobility literature studying the impact of total family background in recent years. Studies on sibling correlations (e.g. Björklund and Jäntti 2020), multigenerational mobility (e.g. Helgertz and Dribe 2021), and multidimensional mobility (e.g. Hällsten and Thaning 2022) have all arrived at this conclusion despite their very different approaches.

At the surname group level, much of the status variation in a son's generation corresponds to the variation observed in their father's generation – both in an ascription and in an achievement society. High levels of surname status persistence do not mean that society is stagnant. Intergenerational regression to the mean at levels found here, around 0.8, imply that much of the surname status inequality seen in 1880 has disappeared by 2016. However, this reduction in inequality took more far longer than three generations (in contrast to what is hypothesized in e.g. Becker and Tomes 1986), and inequalities between lineages persist to some extent over several centuries. Although we cannot capture these in the current study, new surname inequalities on the basis of ethnicity have likely become more important than those based on pre-industrial status groups in Sweden in recent decades (cf. Arai and Skogman Thoursie 2009 and our results on this group at the aggregate level).

We find that pre-industrial elite surname groups maintain their relative advantage between 1880 and 2016. In 1880, those with elite surnames were 112 times more likely than those with patronymic surnames to hold top 1% occupations (HISCAM value 99). In 2015, the great-great-great-grandchildren of these 1880 elites were still three times more likely to hold these highest-status positions than their peers from common (patronymic) surname backgrounds. There was convergence between surname groups as the average social status of initially disadvantaged surname

groups increased more rapidly than that of pre-industrial elites. This convergence was slow, however, with a substantial influence of ancestors six or more generations prior on individual status attainment.

Persistence decreases somewhat after 1960. This could be related to contemporary societal changes such as increasing educational attainment, the expansion of the welfare state, the expansion of skilled work with clearer formal requirements, or increasing labor force participation of women. The inflow of migrants is likely a substantial contributing factor to lifting the relative position of historically disadvantaged Swedish surname groups. We observe how the lowest-status occupations are increasingly occupied by first- and second-generation immigrants after 1960 (those who have no surname in our data).

We compare the informational content of surname groups and individual surnames (ICS). Nine surname groups contain about half as much information on individuals' social status as thousands of individual surnames – more so historically than today, and less among rare surnames. Within surname groups, rare individual surnames contain more information on social status than common surnames. This is as expected if surnames capture family lineages. Between surname groups, however, both rare and very common surname groups contribute to the informativeness of a surname group. These findings suggest that a substantial part of surname status persistence is a group-level process, while (rare) surnames also capture family lineages to some degree.

This conclusion is strengthened by our within-surname group ICS analysis. Individual surnames in the 'rest' surname group have particularly high informational content. This is a heterogeneous group containing different subgroups not distinguished here, such as new high-status families but also those bearing surnames of Finnish or Sami origin. The ICS within surname groups is generally low, despite high occupational immobility at the level of individual families in some of these surname groups (Dalman 2022a). This forms another indication that surnames reflect social groups rather than individual family lineages.

The group level processes captured by surname status persistence contribute to heritable inequality on a societal level, as individuals are born, and generally stay, in a specific surname group. Therefore, surnames are an important aspect of intergenerational persistence that we should consider when discussing inequality due to status inheritance. Comparing our high surname status persistence with Swedish levels of individual-level intergenerational mobility found in Adermon, Lindahl and Palme (2021) suggests that there are processes of intergenerational persistence at the surname group level that are not captured by (grand)parent-child 'underlying' status associations. By its high level, surname status persistence reveals a form of persistent – intergenerational – inequality that is not captured by individual-level measures of intergenerational mobility.

The difference between high surname status persistence and low parent-child associations in socioeconomic status (as found in the literature) can be explained by ‘local’ intergenerational mobility of members of surname groups, where occupational status of individuals in a surname group fluctuates between generations around a group average. Such persistence at the group level could also explain the finding of multigenerational associations in socioeconomic status in cases where ancestors’ influence cannot be direct (e.g. Hällsten and Kolk 2020; Helgertz and Dribe 2021). Surname groups, reflecting pre-industrial ‘social status’ in a Weberian sense, form a valuable tool to study qualitative differences between intergenerational mobility that reduces inequality at the societal level and intergenerational mobility that does not do so. They also help us to distinguish between ascribed (surname group) and achieved (individual) occupational status differences between parents, and how each of these persist over generations.

This approach can be applied to contexts outside of Sweden. Generally, countries using surnames have several different surname types that upon adoption directly or indirectly reflected a particular social status. For example, pre-industrial status groups associated with political or cultural dominance (as here), castes, specific occupations, lingual, religious, ethnic, or other cultural subgroups often adopted different types of surnames and hold different status positions in society either historically or today. While ethnic group-level processes of intergenerational persistence are commonly acknowledged, persistent social stratification based on pre-industrial status origins has not been studied previously.

The approach could further be extended by direct comparison between individual-level parent-child associations in occupational status and surname status persistence, and by the inclusion of women in the analyses (see [Dalman 2022](#)). Surname status could be used to study other social stratification processes such as assortative mating, and the role of assortative mating in intergenerational persistence could be studied using both partners’ surname status. It is a valuable complement to individual-level intergenerational mobility measures, as it sheds light on the broad key question of how social environment affects individual stratification outcomes. However, it captures a very different form of intergenerational persistence than parent-child mobility measures do and is certainly not a valid replacement of such measures.

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Appendix

The informational content of surnames and surname groups by rarity

Previous studies have shown that surname frequency is important for the informational content of surnames (ICS). The ICS decreases rapidly for somewhat common surnames with more than 5-50 bearers depending on sample size (Güell et. al. 2015, figure 4; Santavirta & Stuhler 2021, figure 2). We see a similar pattern for the individual surname ICS in Sweden in 1880 and 2010, depicted in figure 3. Moving from a sample with only relatively common surnames with more than 10 bearers among men aged 30-60 to a sample with rare surnames (2-499 bearers), our ICS estimate roughly doubles in 1880 and increases eightfold in 2010 (see figure 3).

However, only about 30% of the population has a surname with less than 500 bearers. A sample based on rare surnames is therefore not necessarily representative of the general population. In fact, in Sweden high-status surname groups are consistently overrepresented in the rare surname sample as surname rarity is associated with higher occupational status (as in Finland, see Santavirta and Stuhler 2021, figure 3). Elite and other high-status surnames are 2.5-1.5 times as common among rare surnames (see appendix table A.3). The big geographic and patronymic surname groups are instead 4.5 times overrepresented among common surnames and hold on average lower status occupations. It therefore becomes unclear whether rare surnames have a higher informational content because they represent family links better than common surnames, or because they represent high-status groups with higher intergenerational persistence.

It is important to note that ICS estimates necessarily weight rare surnames more heavily than common surnames and therefore reflect intergenerational mobility among those with rare surnames better than mobility among those with common surnames. This can partly be avoided by excluding surname frequencies that are very unequally distributed over the population from an analysis. In our case, we exclude surname frequencies below 10 bearers from our main analyses to compare surname group ICS to individual surname ICS so that our individual surname ICS does not only reflect the high informational content of high-status rare surnames (results shown in table 1).

In figure 3, we see how the ICS at the surname group level is affected by the exclusion of rare or common surnames. The group-level ICS is less sensitive than the surname-level ICS to differences in surname frequency; both the exclusion of very rare (≤ 10 bearers) and very common (≥ 500 bearers) surnames reduce the group-level ICS. It is highest in both 1880 and 2010 when a wide range of surname frequencies is included. Compared to our main model, the 2010 group-level ICS doubles when including both rare and common surnames. Importantly, the group-

level ICS is roughly the same in the rare and common surname subsamples in both 1880 and 2010.

Sensitivity analysis

Name changing as a social ladder

Some surname groups have many new entrants over the period 1880-1950, especially ‘French-sounding’ and ‘geographical’. Many newly adopted surnames among those with high-status occupations were of the ‘French-sounding’ type. The share of individuals bearing ‘patronyms’ decreased, while some groups were rather stable (nobility, latinized, Greek-sounding). For details on the distribution of surname groups, see table A.1 in the appendix. These name mutations are not translated consistently in differences in surname status persistence. In particular, ‘French-sounding’ and ‘Greek-sounding’ names experience highly similar surname status persistence, despite their differential popularity among name changers (see for exact levels of surname status persistence among both surname groups figure 6 and table 2).

We ‘observe’ no surname changing after 1950, as we observe ancestor rather than individual surnames. If we again compare ‘French-sounding’ – the group including many 1880-1950 name changers – to ‘latinized’ and ‘Greek-sounding’, we see in table 2 that their surname status persistence after 1950 was similar: the three groups experienced a similar drop in persistence after 1950. That is, we do not see higher (or lower) persistence among a surname group with many name changers (French-sounding) as compared to groups with fewer name changes.

Length of generations: thirty vs twenty-five years

The average age at childbirth for both fathers and mothers first decreased and then increased over the course of the twentieth century. Moreover, average age at childbirth differs by socioeconomic status and may therefore differ between surname groups (Dribe and Smith 2021; Kolk 2015; Stanfors and Scott 2013). Our assumptions on the intergenerational age difference have repercussions for implied surname status persistence; if generations are shorter than 30 years for certain groups, persistence for those groups would be higher than our presented estimates.

Appendix table A.1 shows implied intergenerational rates of regression to the mean using “Gini” coefficients for each surname group in each census year as in table 1, based on a generational length between fathers and sons of 25 years. Persistence b with 25- respectively 30-year intervals relate to each other in the following way, where t is time in years: $(\bar{x}_{zt}/\bar{x}_{z0})^{25/t} \sim (\bar{x}_{zt}/\bar{x}_{z0})^{30/t}$. Thus, persistence is somewhat higher in appendix table A.6 than in table 1. Average persistence over the full period ranges 0.66 (for patronyms) to 0.88 (for titled nobility). The 25-year intergenerational distance might be a more realistic assumption in mid-twentieth

century birth cohorts and among low-status surname groups. However, table A.5 illustrates that changing the generational length (by a realistic amount) does not change implied surname status persistence much.

Surname status inequality and persistence using social class

HISCO-coded occupations can be transformed into social classes using the HISCLASS scheme, which distinguish classes based on skill level, the degree of supervision and whether urban or rural (van Leeuwen and Maas 2011). This results in a class scheme consisting of twelve classes: 1) higher managers, 2) higher professionals, 3) lower managers, 4) lower professionals and medium-skilled clerical and sales workers, 5) lower-skilled clerical and sales workers, 6) foremen, 7) medium-skilled workers, 8) farmers and fishermen, 9) lower-skilled non-farm workers, 10) lower-skilled farm workers, 11) unskilled non-farm workers, and 12) unskilled farm workers.

As we study Sweden during and after its transition to an industrial and service economy, the classes of agricultural workers virtually disappear over time. In order to make the scheme more consistent over time we combine the low-skilled and unskilled farm workers into one class, and distinguish non-farm workers by skill level. Hence, classes 6) and 7) are combined into skilled manual workers; class 9) is kept as lower-skilled workers; 11) as unskilled workers; and (10) and (12) are combined into farm workers, resulting in a scheme consisting of ten rather than twelve classes.

Social classes are differentiated more among the nineteenth century upper classes of non-manual workers than elsewhere. This is done for three reasons: firstly, while observing all forms of surname mobility, we will in our analysis emphasize the permeability of the upper classes, consistent with a societal perception of equality of opportunity. Secondly, as this study covers a long time period with substantial structural transformations, upper classes in 1880 become broad classes in 2015. Thirdly, as the Swedish surname groups are far more differentiated at the top than bottom of the status distribution, we expect most of the elite surname groups to be clustered in high-status occupations. Thus, by differentiating more among the higher-status occupations, we will be better able to capture differences between the different elite surname groups.

In the main analysis, we only presented results using occupational status, but we have also conducted all analyses on surname status inequality and persistence using social class (HISCLASS) as described above. Descriptive statistics on the distribution of HISCLASS classes over Swedish men aged 30-60 in terms of HISCLASS are shown in appendix table A.3. Surname status inequality and surname status persistence in terms of HISCLASS are presented in appendix table A.4 and figure A.6, and absolute upward and downward mobility in terms of HISCLASS is presented in figures A.4-A.5. Our findings using social class are

broadly similar to those using occupational status. One exception is the relative position of patronymic surnames historically. Their HISCLASS “Gini” coefficient is higher historically than their HISCAM “Gini” coefficient. In terms of HISCLASS, those bearing patronymic surnames regress slowly from a “Gini” around 0.08 (1880-1960) to the population mean by 2010 (see figure A.6). In terms of HISCAM, their 1880 “Gini” was -0.43 which decreased to -0.15 by 1960 (see figure 6). Patronymic surnames are strongly underrepresented historically in high-status occupations in terms of HISCLASS as well as HISCAM (see figure 5 and figure A.4). Farming occupations are however ranked lower in terms of HISCAM than in terms of HISCLASS; they are positioned towards the bottom of the male HISCAM distribution in Sweden but are placed between the medium- and low-skilled manual working classes in terms of HISCLASS. As a result they appear more disadvantaged overall in terms of HISCAM than in terms of HISCLASS.

Tables and figures

Table A.1: Surname group distribution: Share of the sample in each surname group for each census year.

	Nobility, titled	Nobility, untitled	Latinized	French-sounding	Greek-sounding	Geographical	Soldier	Patronym	Rrest	no ancestor name	TOTAL
1880	0.09	0.20	0.22	1.17	0.70	21.06	1.46	68.01	7.08		737,562
1890	0.10	0.22	0.22	1.48	0.77	23.24	1.50	64.61	7.87		748,245
1900	0.10	0.23	0.24	1.96	0.84	25.71	1.54	61.16	8.23		795,958
1910	0.11	0.24	0.25	2.44	0.92	27.38	1.62	58.18	8.86		867,108
1950	0.08	0.21	0.34	2.83	0.95	29.57	2.04	49.50	14.49		1,417,801
1960	0.07	0.21	0.35	2.75	0.91	28.27	1.95	44.58	14.64	6.27	1,118,926
1970	0.07	0.20	0.32	2.54	0.86	26.97	1.87	43.53	13.32	10.32	1,305,296
1980	0.07	0.20	0.33	2.55	0.87	26.84	1.87	42.67	13.03	11.58	1,549,171
1990	0.07	0.20	0.33	2.51	0.86	26.42	1.82	41.87	12.70	13.21	1,724,791
2002	0.07	0.20	0.31	2.46	0.83	25.55	1.77	40.34	12.54	15.93	1917261
2010	0.07	0.18	0.29	2.32	0.78	23.96	1.66	38.18	11.80	20.77	1,901,679
2015	0.07	0.18	0.27	2.19	0.74	22.58	1.57	36.05	11.14	25.20	1,972,014

Table A.2: Rarity of surnames: Average frequency of each individual surname by surname group and census year, among men aged 30-60.⁸¹

	1880	1890	1900	1910	1950	1960	1970	1980	1990	2002	2010	2015
Nobility, titled	60	66	55	77	47	67	69	69	69	69	70	70
Nobility, untitled	48	50	54	67	104	156	153	149	146	149	149	149
Latinized	26	28	32	36	48	66	69	69	69	70	73	75
French-sounding	111	139	197	256	809	1,159	1,157	1,151	1,143	1,149	1,163	1,172
Greek-sounding	409	678	1,025	1,451	419	605	619	610	609	606	612	613
Geographical	1,213	1,381	1,582	1,840	3,772	5,416	5,388	5,355	5,300	5,319	5,337	5,361
Soldier	411	465	559	697	1,595	2,289	2,271	2,234	2,220	2,225	2,240	2,253
Patronym	92,580	90,403	93,430	100,815	129,541	167,084	163,757	160,741	160,215	160,442	161,159	161,487
Rest	246	295	352	400	489	667	672	673	669	666	664	665
TOTAL	65,279	60,967	59,762	61,413	65,372	81,293	81,287	79,373	79,087	78,790	79,446	79,631

⁸¹ See main text for other information about the sample. For the sample in 1960-2016 these numbers do not refer to actual surnames but to ancestral surnames, see for other information on data and definitions main text.

Table A.3: Social class distribution: Population totals and shares in social classes (% , HISCLASS scheme), among Swedish men aged 30-60 in 1880-2016

	Higher managers	Higher professionals	Lower managers	Lower professionals, clerical and sales personnel	Lower clerical and sales personnel	Medium-skilled workers and foremen	Farmers and fishermen	Lower-skilled workers	Unskilled workers	Farmworkers	Unknown or not in labour force	Totals (N)
1880	0.63	1.63	3.29	3.52	0.92	10.7	29.97	7.57	20.18	21.6	10.53	737,599
1890	0.69	1.81	3.67	4.43	1.15	12.7	27.49	9.4	15.91	22.74	9.5	748,290
1900	0.78	2.05	4	5.09	1.47	14.26	25.75	11.14	17.62	17.83	8.53	796,004
1910	0.94	2.04	4.42	5.81	2.02	16.42	23.84	13.55	12.71	18.24	4.6	872,184
1950	2.16	4.82	6.34	6.92	5.5	18.81	13.29	19.37	11.74	11.07	4.17	1,485,629
1960	3.38	6.34	2.82	13.36	7.13	24.34	11.15	19.15	7.02	5.29	4.71	1,560,313
1970	3.6	8	3.68	17.04	8.05	25.39	6.34	18.87	5.6	3.42	8.45	1,542,569
1980	4.27	12.25	4.26	12.97	14.35	23.53	3.83	17.03	5	2.51	11.22	1,647,255
1990	5.17	15.09	4.2	13.1	14.64	22.91	2.49	15.99	4.34	2.07	15.92	1,718,519
2002	3.51	16.23	6.2	17.76	11.31	15.49	0.25	23.12	3.59	2.54	20.16	1,940,796
2010	5.42	17.16	4.56	17.14	13.15	14.67	0.49	21.8	3.49	2.11	13.53	1,935,632
2015	4.85	19.86	2.91	16.94	15.22	11.89	0.44	23.16	3.16	1.56	26.12	2,021,199

Table A.4: Relative representations of surname groups in HISCLASS social classes in Sweden in (a) 1880, (b) 1910, (c) 1950, (d) 1960, (e) 1990, and (f) 2010.

(a) 1880	Higher managers	Higher professionals	Lower managers	Lower professionals, clerical and sales personnel	Lower clerical and sales personnel	Medium-skilled workers and foremen	Farmers and fishermen	Lower-skilled workers	Unskilled workers	Farmworkers	Unknown or not in labour force
<i>Nobility, titled</i>	67.70	7.97	3.67	2.15	3.37	0.42	0.37	0.29	0.11	0.08	0.72
<i>Nobility, untitled</i>	48.26	7.03	3.63	2.29	3.62	0.63	0.37	0.68	0.36	0.21	0.56
<i>Latinized</i>	7.55	8.92	2.97	3.60	3.29	1.34	0.46	0.97	0.62	0.34	0.60
<i>French-sounding</i>	2.59	4.85	2.13	2.91	2.33	1.57	0.53	1.68	0.72	0.52	0.56
<i>Greek-sounding</i>	2.65	4.15	1.69	2.57	2.28	1.60	0.61	1.25	0.89	0.55	0.63
<i>Geographical</i>	1.34	1.87	1.64	1.79	1.74	1.76	0.53	1.67	1.04	0.67	0.64
<i>Patronym</i>	0.22	0.32	0.59	0.52	0.58	0.69	1.25	0.54	1.02	1.18	1.11
<i>Rest</i>	4.49	3.30	2.30	2.53	2.08	1.44	0.41	2.37	0.83	0.51	1.25
(b) 1910	Higher managers	Higher professionals	Lower managers	Lower professionals, clerical and sales personnel	Lower clerical and sales personnel	Medium-skilled workers and foremen	Farmers and fishermen	Lower-skilled workers	Unskilled workers	Farmworkers	Unknown or not in labour force
<i>Nobility, titled</i>	40.72	7.60	2.27	1.59	3.37	0.34	0.25	0.36	0.18	0.08	1.12
<i>Nobility, untitled</i>	24.83	6.77	2.24	1.89	3.18	0.65	0.32	0.51	0.44	0.25	0.73
<i>Latinized</i>	5.92	6.37	1.72	2.61	1.85	0.98	0.45	0.85	0.75	0.39	0.59
<i>French-sounding</i>	1.68	2.49	1.51	2.01	1.69	1.26	0.58	1.09	0.88	0.60	0.47
<i>Greek-sounding</i>	1.85	2.71	1.33	1.93	1.62	1.22	0.63	1.03	0.85	0.69	0.61
<i>Geographical</i>	1.20	1.44	1.23	1.29	1.27	1.22	0.67	1.21	1.04	0.82	0.61
<i>Patronym</i>	0.38	0.36	0.75	0.68	0.70	0.87	1.28	0.86	1.00	1.15	1.16
<i>Rest</i>	2.89	2.86	1.61	1.73	1.73	1.09	0.50	1.12	0.94	0.75	1.39

(c) 1950	Higher managers	Higher professionals	Lower managers	Lower professionals, clerical and sales personnel	Lower clerical and sales personnel	Medium-skilled workers and foremen	Farmers and fishermen	Lower-skilled workers	Unskilled workers	Farmworkers	Unknown or not in labour force
<i>Nobility, titled</i>	9.40	5.38	1.64	1.38	1.83	0.39	0.35	0.36	0.27	0.23	4.97
<i>Nobility, untitled</i>	7.54	4.49	1.31	1.21	1.64	0.57	0.41	0.50	0.52	0.44	1.81
<i>Latinized</i>	2.99	3.44	1.60	1.79	1.80	0.75	0.43	0.64	0.61	0.49	1.27
<i>French-sounding</i>	1.61	1.83	1.27	1.43	1.39	1.00	0.64	0.90	0.88	0.65	1.07
<i>Greek-sounding</i>	1.78	1.86	1.22	1.38	1.33	0.93	0.69	0.89	0.87	0.79	1.14
<i>Geographical</i>	1.13	1.24	1.09	1.12	1.17	1.04	0.71	1.03	1.03	0.86	1.05
<i>Patronym</i>	0.62	0.47	0.85	0.77	0.77	0.99	1.34	1.01	1.02	1.20	0.90
<i>Rest</i>	1.71	2.04	1.25	1.42	1.31	0.96	0.56	0.94	0.88	0.70	1.18
(d) 1960	Higher managers	Higher professionals	Lower managers	Lower professionals, clerical and sales personnel	Lower clerical and sales personnel	Medium-skilled workers and foremen	Farmers and fishermen	Lower-skilled workers	Unskilled workers	Farmworkers	Unknown or not in labour force
<i>Nobility, titled</i>	3.23	3.03	1.33	1.62	1.16	0.21	1.08	0.61	0.22	0.15	0.98
<i>Nobility, untitled</i>	2.89	2.57	1.25	1.48	1.24	0.49	0.62	0.68	0.49	0.44	0.83
<i>Latinized</i>	2.34	2.25	1.30	1.56	1.29	0.68	0.45	0.64	0.54	0.53	1.16
<i>French-sounding</i>	1.54	1.44	1.07	1.31	1.18	0.86	0.68	0.89	0.82	0.67	0.93
<i>Greek-sounding</i>	1.62	1.45	1.06	1.29	1.03	0.87	0.75	0.86	0.88	0.72	1.06
<i>Geographical</i>	1.15	1.13	1.06	1.11	1.07	1.00	0.70	0.97	1.03	0.92	1.05
<i>Patronym</i>	0.68	0.68	0.93	0.78	0.93	1.03	1.42	1.06	1.07	1.16	0.91
<i>Rest</i>	1.53	1.48	1.12	1.32	1.08	0.89	0.62	0.88	0.81	0.75	1.04

(e) 1990	Higher managers	Higher professionals	Lower managers	Lower professionals; clerical and sales personnel	Lower clerical and sales personnel	Medium-skilled workers and foremen	Farmers and fishermen	Lower-skilled workers	Unskilled workers	Farmworkers	Unknown or not in labour force
<i>Nobility, titled</i>	2.11	2.13	1.65	1.01	0.98	0.33	2.35	0.42	0.32	0.48	1.22
<i>Nobility, untitled</i>	2.27	1.88	1.34	1.10	0.93	0.50	1.19	0.54	0.41	0.67	1.09
<i>Latinized</i>	1.58	1.63	1.15	1.11	1.10	0.68	0.84	0.65	0.57	0.60	1.00
<i>french-sounding</i>	1.33	1.27	1.16	1.09	1.08	0.83	0.84	0.81	0.78	0.77	0.89
<i>Greek-sounding</i>	1.28	1.31	1.05	1.09	1.02	0.85	0.83	0.82	0.81	0.83	0.91
<i>Geographical</i>	1.13	1.11	1.08	1.07	1.05	0.92	0.70	0.93	0.86	0.91	0.89
<i>Patronym</i>	0.92	0.85	0.99	0.96	1.01	1.04	1.49	1.03	0.98	1.20	0.81
<i>Rest</i>	1.32	1.31	1.11	1.11	1.05	0.83	0.74	0.82	0.73	0.87	0.92
(f) 2010	Higher managers	Higher professionals	Lower managers	Lower professionals; clerical and sales personnel	Lower clerical and sales personnel	Medium-skilled workers and foremen	Farmers and fishermen	Lower-skilled workers	Unskilled workers	Farmworkers	Unknown or not in labour force
<i>Nobility, titled</i>	2.03	1.88	1.30	1.05	0.80	0.39	1.86	0.50	0.43	1.62	0.70
<i>Nobility, untitled</i>	1.59	1.70	1.38	1.13	0.87	0.55	0.64	0.59	0.47	0.99	0.70
<i>Latinized</i>	1.33	1.46	1.06	1.19	0.97	0.71	0.75	0.73	0.50	0.66	0.62
<i>French-sounding</i>	1.20	1.19	1.07	1.14	1.02	0.87	1.06	0.83	0.62	0.85	0.66
<i>Greek-sounding</i>	1.26	1.18	1.10	1.11	0.98	0.87	0.83	0.87	0.59	0.84	0.64
<i>Geographical</i>	1.13	1.08	1.05	1.09	1.01	0.94	0.82	0.93	0.65	0.88	0.68
<i>Patronym</i>	1.02	0.93	1.04	1.03	1.00	1.06	1.49	0.98	0.69	1.35	0.67
<i>Rest</i>	1.22	1.21	1.13	1.12	0.99	0.87	0.84	0.84	0.62	0.81	0.68

Table A.5: surname status persistence. Implied intergenerational rate of regression to the mean using “Gini” coefficients for each surname group in each census year. Assumed intergenerational distance of 25 years.

	Nobility, titled	Nobility, untitled	Latitized	French-sounding	Greek-sounding	Geographical	Patronym	Rest	AVERAGE (unweighted)
1880-1910	0.97	0.98	0.91	0.71	0.75	0.71	0.85	0.85	0.90
1910-1950	0.94	0.91	0.87	0.84	0.84	0.84	0.86	0.80	0.91
1960-1990	0.85	0.83	0.69	0.72	0.70	1.07	0.60	0.72	0.72
1990-2015	0.67	0.65	0.62	0.67	0.61	0.57	0.29	0.70	0.60
1880-2010, excl 1950-1960	0.88	0.87	0.81	0.76	0.78	0.83	0.66	0.80	0.83

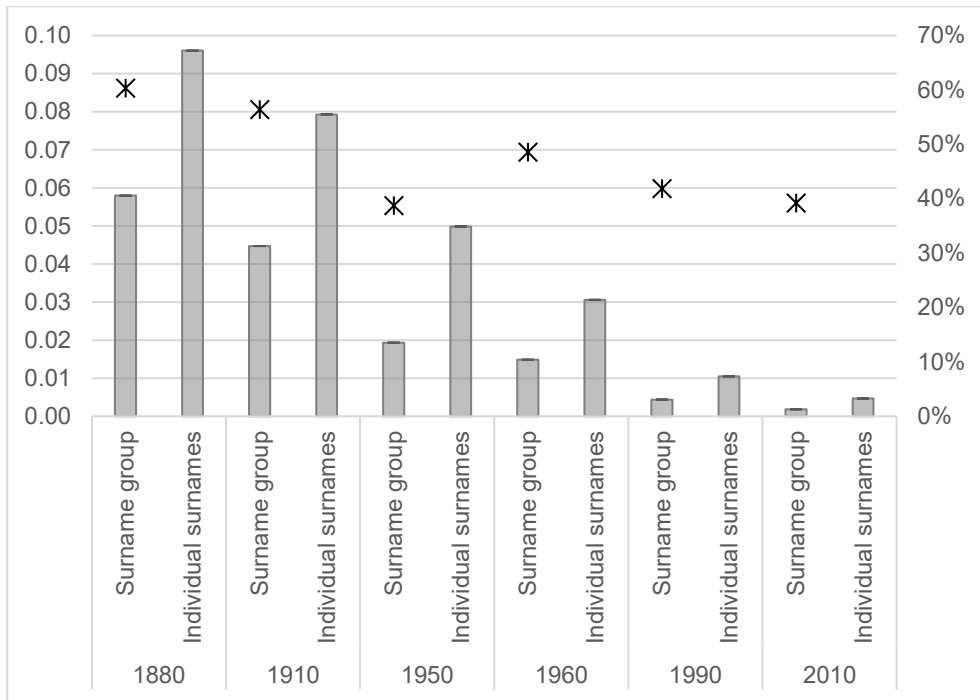


Figure A.1 Informational content of surname groups and individual surnames. Bars and primary axis represent ICS from models controlling for demographic and geographic differences: age, marital status (married/partner, div/wid, never married, unknown), immigrant status, birth county, number of children/siblings. Marks and secondary axis represent the share of total variance in HISCAM explained by surnames (N=5,000-8,000) that is explained by surname groups (N=9-10). Among men aged 30-60 in each census, holding surnames with at least 10 bearers. Number of observed individuals per census: 574,869-1,222,030.

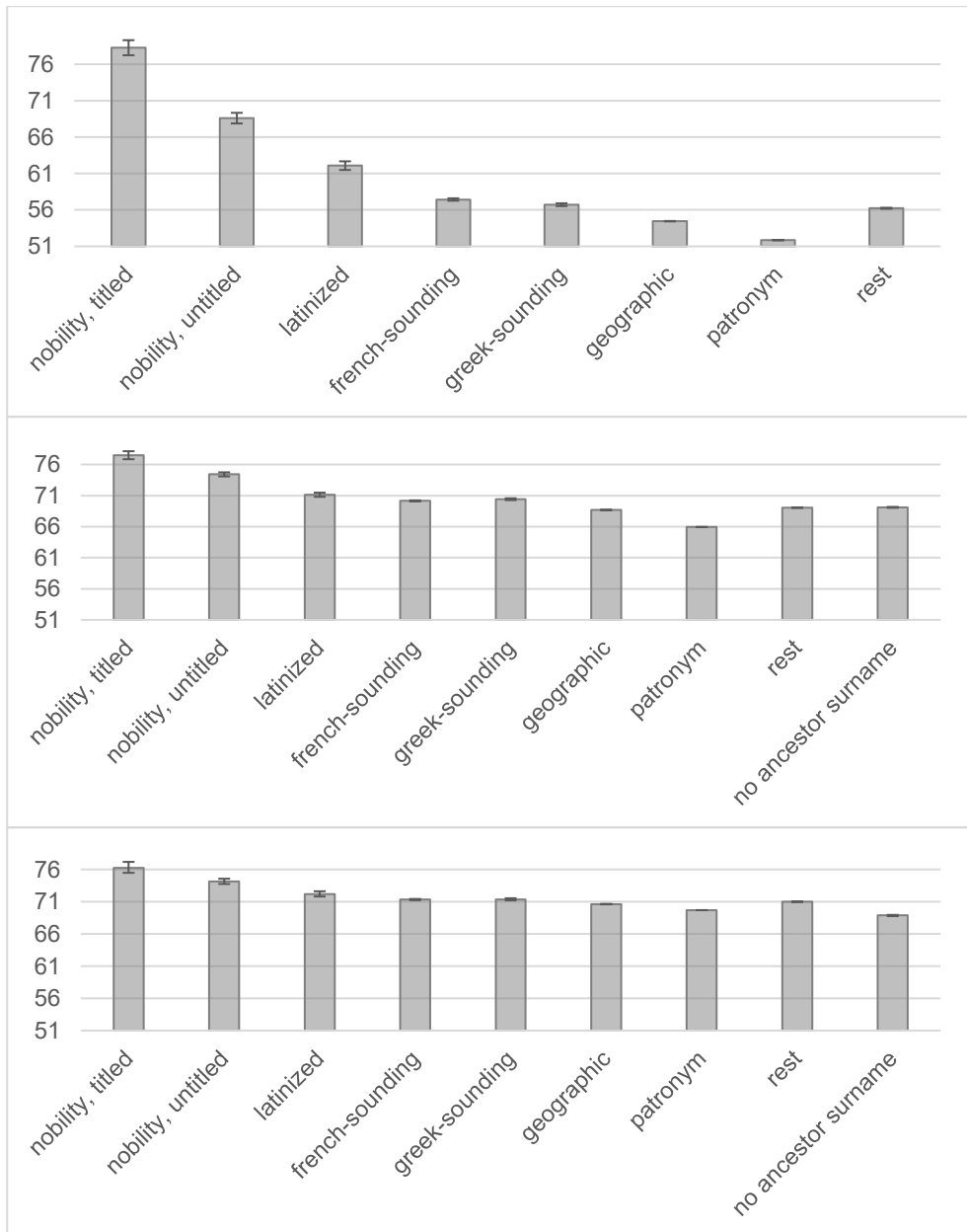


Figure A.2 Surname group effect sizes based on ICS(2) model as in table 1, 99% confidence intervals shown as bars: (a) expected 1880 HISCAM for a 30 year old man born in the Stockholm region, married and living in a two person household, by surname group, (b) expected 1960 HISCAM for idem, and (c) expected 2010 HISCAM for idem. With in 2010: no ancestor average = e.g. salesman/contractor; patronym average = e.g. transport and communications supervisor, latinized average = e.g. mechanical engineering technician, titled nobility average = e.g. author (literary)

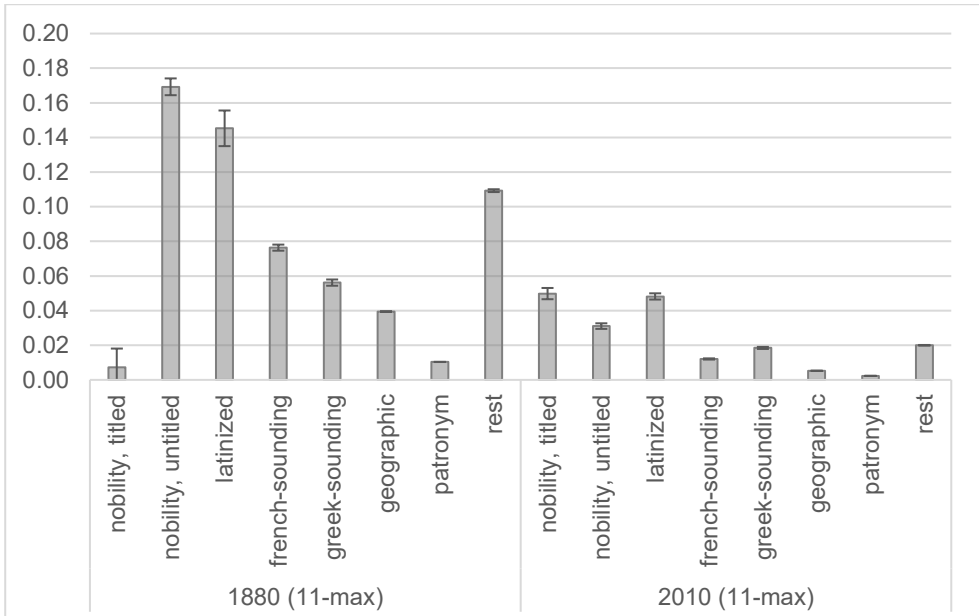


Figure A.3 ICS within surname groups. As figure 10 but with common instead of rare surnames (surname frequency as in table 1 with main ICS results). For further definitions and sample descriptions see main text.

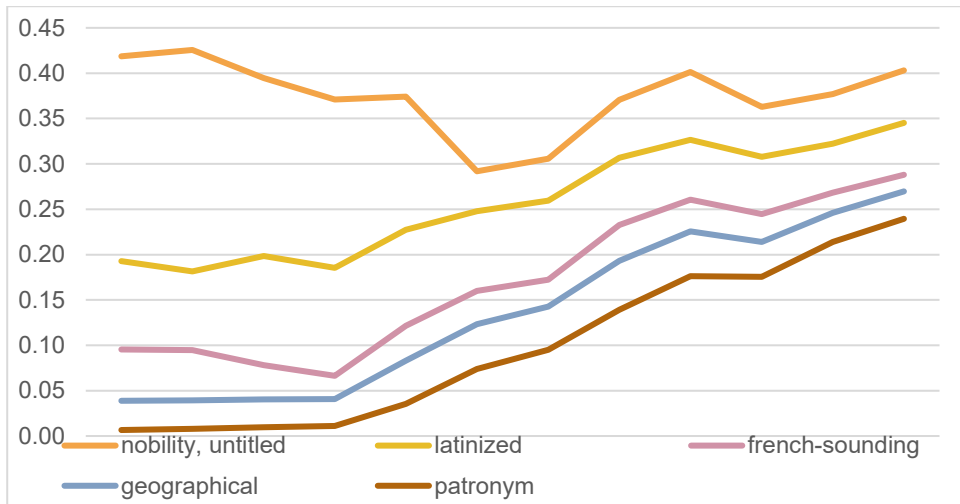


Figure A.4: persistence of surname inequality among higher classes. The share of certain surname groups among the higher managerial and professional classes (HC 1+2). Men aged 30-60 in Sweden 1880-2016.

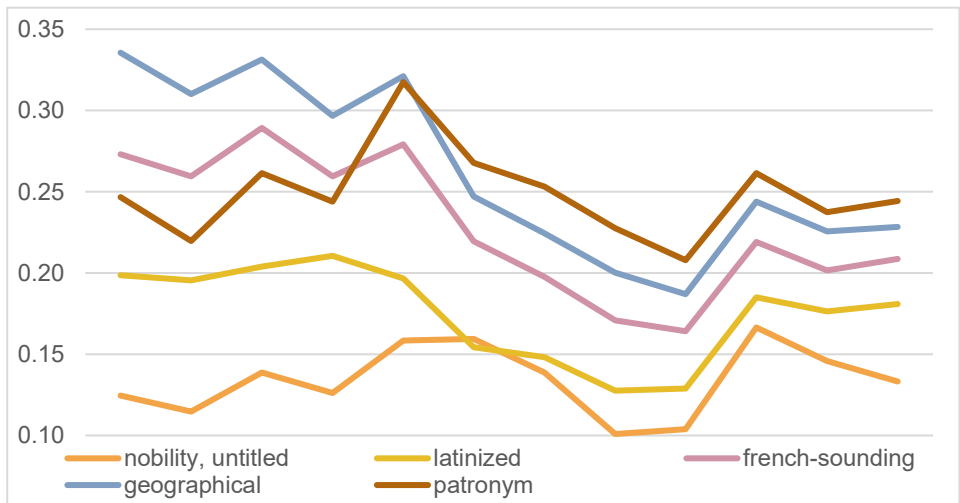


Figure A.5: persistence of surname inequality among lower social classes The share of certain surname groups among low- and unskilled non-farm workers (HC 9+11). Men aged 30-60 in Sweden 1880-2016.

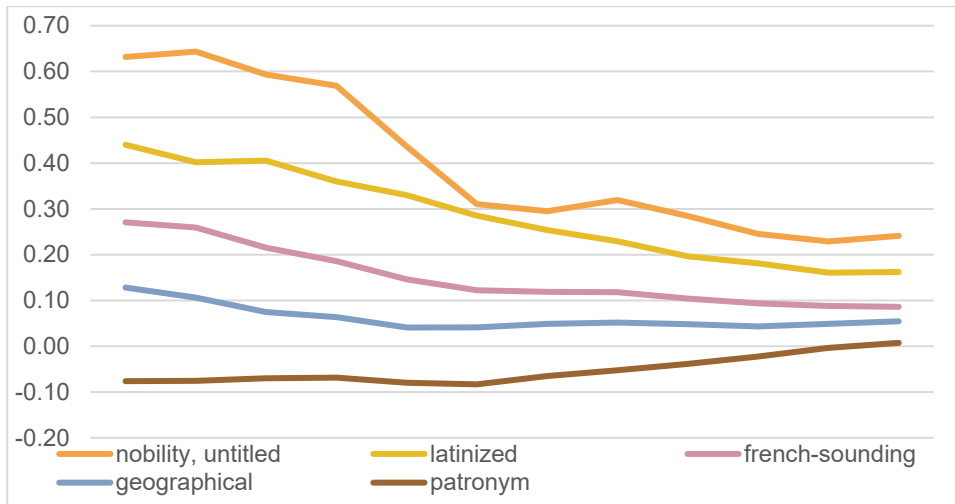


Figure A.6: surname group “GINIs”. The “Gini” coefficient for a surname group in a census year represents deviation of that surname group’s HISCLASS distribution from the full population’s HISCLASS distribution. Among men in Sweden aged 30-60 in 1880-2016.

Paper III



The impact of mothers. Intergenerational mobility in Sweden 1865-2015⁸²

Elien Dalman

Abstract: Social mobility studies have traditionally measured parent-child associations using one 'dominant' parent to reflect social origin. However, the institutions of family and work have changed substantially over the past hundred-fifty years, in Sweden and elsewhere. These changes are associated with shifting intergenerational mobility, the patterns and trends of which look different when both parents are considered. I study these changes using census and register data covering 1865-1985 Swedish birth cohorts and their parents. The father-child, rank-rank correlation in occupational status was stable as Sweden industrialized and subsequently decreased as Sweden transitioned from a male breadwinner to a dual-earner family type. The impact of mothers' occupational status increased simultaneously, both in the full population and among dual-earner families. In the 1970s, Sweden became a dual-earner society, and among cohorts born since 1960, mothers' and fathers' occupational status became roughly equally important for child status attainment – unlike before. Mobility patterns by family type converge. Gender continues to play an important role in intergenerational mobility, with same-gender parent-child associations being stronger than opposite-gender associations. Patterns of intergenerational mobility differ by parental gender also in a dual-earner society; fathers matter more in higher-status families, while mothers matter more in lower-status families. Parental resources are not independent, but accumulate; I observe multiplicative accumulation of fathers' and mothers' status. These findings together suggest that both parents need to be included to describe long-term mobility patterns and trends.

⁸² This work was supported by the LONGPOP project “Methodologies and data mining techniques for the analysis of big data based on longitudinal population and epidemiological registers”, funded by the European Union’s Horizon 2020 research and innovation program under the Marie Skłodowska-Curie [grant agreement No 676060]. Disclaimer: This document reflects only the authors’ view and the Agency is not responsible for any use that may be made of the information it contains. I thank participants and commentators at the 2019 RC28 annual spring meeting, 2019 workshop on “Intergenerational mobility, gender and family formation in the long run” at Statistics Norway, 2019 ESHD conference, my 2022 final seminar, and the 2022 ECSR annual conference, for valuable comments and suggestions on earlier versions of this paper.

Introduction

Intergenerational social status mobility is traditionally seen as a family-level process where fathers' occupational attainment affects sons' occupational attainment (e.g. Blau and Duncan 1967).⁸³ This exclusion of mothers' occupational status as a component of social origin is understandable in the context of America in the 1960s – the heyday of the male breadwinner model. Several more recent studies have however shown that in a context of increasing mothers' labor force participation, their exclusion as a component of social origin becomes increasingly problematic (e.g. Korupp, Ganzeboom & Van Der Lippe 2002; Beller 2009; Hout 2018; Thaning & Hällsten 2020). Their exclusion may be problematic before the heyday of the male breadwinner family as well, especially among families with working mothers (cf. Kong, Maas & van Leeuwen 2020). Does simply including mothers' occupational status resolve the question of whether intergenerational social status mobility should be studied at the family or individual level? That is, should we study the association between family of origin to adult family outcomes, or individual transmission of fathers and mothers to their children?

The family, rather than the individual, has often been seen as the relevant unit of analysis when it comes to processes of intergenerational mobility of social status (e.g. Erikson & Goldthorpe 1992). To be able to see the family as a unit represented by one parent, the resources of the other parent should be negligible (e.g. mothers do not contribute income), or well represented by the other parent (e.g. 'perfect' assortative mating), and resources of one parent should affect child outcomes independently of resources of the other parent (noncooperative households). That is, if parental resources interact or there are differences between contexts in levels of assortative mating and gainful employment, then the relative role played by each parent in 'social origin' of their children will change. This issue has been raised repeatedly in the literature (e.g. Acker 1973; Sørensen 1994; Beller 2009) – but despite such considerations, the convention has not changed. Moreover, one-parent measures of intergenerational mobility suffer from biases due to marital sorting that differ across contexts, making them problematic in comparative studies (Choi, Chung, and Breen 2020; Ermisch, Francesconi, and Siedler 2006; Holmlund 2022).

Because resources of each parent do not exist in a vacuum but rather affect each other, I consider the family as the relevant unit of analysis to study intergenerational mobility. Thus, not only the resources of fathers and mothers are relevant, but also the way in which they interact (Beller 2009). A higher-status father likely does not affect his children's status attainment in the same way when he forms a family with a higher-status mother, as when he forms a family with a homemaker mother. This

⁸³ 'Intergenerational mobility of social status' is used to refer both to social class mobility and occupational status mobility, i.e. all forms of intergenerational mobility of social status where social status is measured using occupational information.

intuition has been confirmed in several contexts (Brea-Martinez 2022; Fischer and Hout 2006; Hout 2018). In this paper I study intergenerational occupational status mobility and demonstrate the changing importance of mothers and fathers in this process over the long term. I do so as the institutions of family and work change fundamentally; using census and register data covering 1865-1985 Swedish birth cohorts. I ask if the extent to which social origin affects sons' and daughters' occupational status attainment changes over time. Importantly, I treat the question about information on which family members should be contained in 'social origin' as an open one. More specifically, I ask if what defines social origin changes over time with changes in family type. By asking these questions I aim to describe intergenerational mobility patterns and trends over the long term and through a changing context of family and work.⁸⁴

The main premise of this study is that the appropriate parental measure in intergenerational mobility depends crucially on both the social and family structure of the society in which it is studied. Does the family form a production unit or only a reproductive unit? In patriarchic nuclear families, occupation-based social stratification was defined by the occupation of the head of household, while in dual-earner families both parents each have a distinct occupational status. But is it gender norms or gender attitudes that are important for the relative importance of each parent in intergenerational mobility: is mothers' occupational status among working mothers (i.e. with relatively egalitarian gender attitudes) as important even if the prevailing norm is for mothers to exit the labor force? Does mothers' occupational status only become relevant in a society with egalitarian gender norms? Or something in between these two extremes?

The impact of fathers' and mothers' occupational status on their sons' and daughters' status attainment likely changes over the long term, as the institutions of family and work change.⁸⁵ The impact of mothers before industrialization and the rise of male breadwinner families has been studied to a very limited extent and has not yet been compared directly with intergenerational mobility in more recent cohorts (see Kong, Maas & van Leeuwen 2020). Before industrialization, most families form agricultural production units. These units vary in size and productivity, but such differences are not reflected in occupational titles. Presumably, occupational status increasingly defines social stratification as formal employment outside of agriculture expands – first among men and later among women (Stanfors and Goldscheider 2017).

⁸⁴ For readability I use 'intergenerational mobility' to refer to intergenerational mobility of occupational status throughout the paper where no explicit reference to occupational status is needed. I study mobility using a continuous measure of occupational status rather than social class, and therefore avoid the term 'social mobility' in reference to my own analyses.

⁸⁵ For readability, children's 'status attainment' is used to refer to their occupational status attainment.

Increasing formal employment among women is captured to a limited extent in previous intergenerational mobility studies because of practical limitations. Only generations where children have attained occupational maturity can be studied, and therefore studies with more recent data often study child cohorts born before the transition to dual-earner society is completed (in the Swedish case, born before 1972, e.g. Breen and Jonsson 2020; Mood 2017; Thaning and Hällsten 2020). In Sweden, large shifts in terms of mothers' labor force participation occurred especially during the 1970s. I study children born until 1985 in Swedish households and thereby include cohorts growing up under dual-earner family norms.

Sweden forms a particularly interesting case to study changes over time in two-parent intergenerational mobility. Firstly, female labor force participation expanded more extensively, and more suddenly, in Sweden than in other countries (e.g. Stanfors & Goldscheider, 2017). Secondly, Swedish educational homogamy is lower than in most other European countries and the US (e.g. Dribe and Nystedt 2013; Schwartz 2013). Thus, an additional impact of mothers' social status, net of fathers', on children's outcomes is particularly likely in Sweden (cf. Thaning & Hällsten, 2020). Moreover, industrialization did not fully take off in Sweden until the 1890s (e.g. Schön, 2012). I can thus observe complete parent-child cohorts under three family types: the family production unit of agricultural households, subsequently the male breadwinner, and finally the dual-earner family type. With the cohorts included, I cover the expansion of institutions for equal opportunities and the introduction of welfare and family policies.

I operationalize family background by including the occupational status of both parents in an additive way (cf. Beller 2009; Thaning and Hällsten 2020), but also address accumulation of parental resources using conditional models. I study the way in which parental resources interact in households to form family social origin, and whether this changes over time. I address what this two-parent approach tells us about long-term developments towards openness or rigidity in Sweden, and whether this story differs from a story based on fathers' occupational status only (as commonly used in the long-term mobility literature, see e.g. Berger et al. 2021; Long and Ferrie 2013; Song et al. 2020). I create longitudinal data for 1865-1985 birth cohorts and their parents. These are based on Swedish census and register data covering the period of 1880-2016.

The remainder of the paper is structured as follows: First, the work and family context in which this study is situated are outlined and other contextual developments are discussed based on previous literature (background). Then theory and previous research are covered. I summarize hypotheses based on a synthesis of theory, previous research and background in the following section, followed by data and study design. On this follow results and a concluding discussion.

Background

Changing institutions of family and work likely shape long-term patterns and trends in intergenerational mobility of occupational status at the family level. In this section, I describe such changes as far as they are relevant for the study of intergenerational mobility. In particular, the changing role of families in production and reproduction, the development of institutions relevant in shaping family and work life over the life-course, and assortative mating.

Families as units of production and reproduction

In countries such as Sweden or the United States women's and mothers' gainful employment increased substantially during the twentieth century (Beller 2009; Stanfors and Goldscheider 2017). Increases of gainful employment reflect both real increases in productive work outside of the household and formalization of work more generally; before industrialization, the family often formed a production (as well as a reproductive) unit, and while both men and women worked, only the occupation of the head of household was formally registered (for example among shopkeepers or farmers; Goldin 1994; Stanfors 2014). In fact, in Sweden, women's labor supply follows a U-shaped trend over the course of economic development – first decreasing then increasing (Goldin 1994).

With industrialization, the male breadwinner family type became increasingly common. In the era of the male breadwinner family, societal gender norms promoted work inside the home for women, and work outside the home for men. With rising educational attainment, automatization of housework, and decreasing fertility, it has been observed that gender norms around women's work shift and women's gainful employment increases (e.g. Luke 2021). Sweden forms a special case in following Goldin's hypothesized U-shaped trend — in the US and several more recently developing countries, increases in women's gainful employment have stalled in more recent decades, rather following an S-shaped trend. It is for these contexts hypothesized that the intergenerational transmission of gender attitudes and norms encourage women to (not) enter the formal labor force (Luke 2021).

Changes in gainful employment are related to broader societal developments. The position of the family in society, and the position of family members in a family, have changed substantially over the past two centuries. This process is summarized in figure 1. The figure shows the share of children growing up in (mothers) and forming (daughters) dual-earner families for each birth cohort of children (x-axis) studied in this paper.

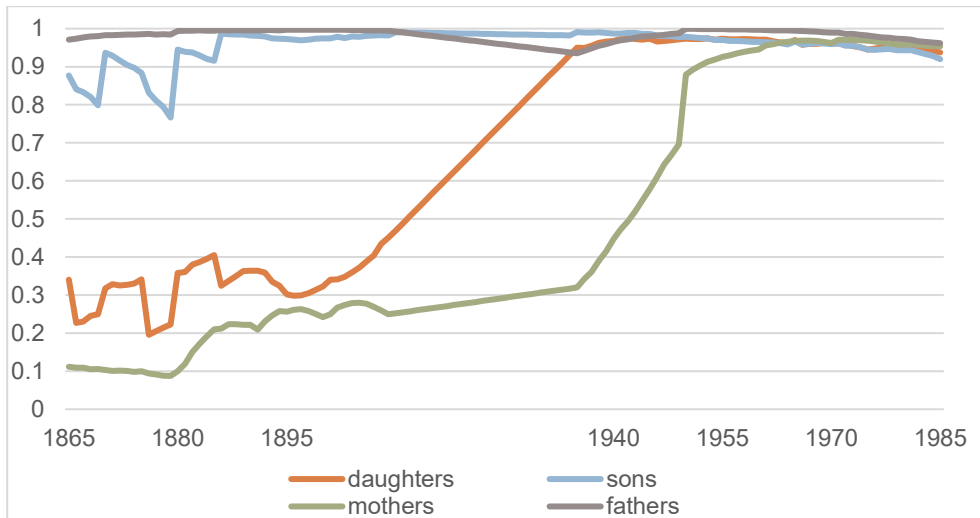


Figure 1: Share of parents and children observed in occupations over child cohorts born 1865-1985.

In Sweden in the nineteenth century, families often formed both production and reproductive units (e.g. Stanfors and Goldscheider 2017). In production units, all family members – including women and children – could be involved in productive work (e.g. Goldin 1979). Thus, in this early period the position of the family in society is strongly related to the occupational structure. In 1880, the majority of Sweden’s adult male population still worked as farmers or as proprietors/self-employed (e.g. shopkeepers, tailors, blacksmiths, jewelers). When the head of household held such occupations, this often implied that the family formed a production unit where other family members also engaged in productive activity. In such a context, I expect the family’s social status to be well represented by the occupational status of the head of household – as that represents a family production unit. Thus, Swedish children born until about 1900 were born in a context where production unit family types dominated.⁸⁶ This period of production unit family types is also characterized by a high reproductive workload for families. Marital fertility for these cohorts lies above four children per woman (Dribe and Scalone 2014). Both the productive nature of family units, and reproductive activity of family units, decrease in subsequent cohorts as Sweden experienced its first demographic transition and industrialized.

⁸⁶ Occupational information does not make clear which families formed production units and which lived in ‘separate spheres’ (male breadwinners), although earlier cohorts and agricultural families are more likely to form production units than later cohorts and those working in other sectors. In most analyses, these two family types are addressed as one group, but the distinction is addressed in the conclusion.

With industrialization, the share of men working as manual and non-manual workers outside of the agricultural sector increased, and thereby the share of families working as production units decreased over this period (Dalman 2022). This development was not accompanied by an increase in gainful employment among married women. Rather, the phase of the family as predominantly a production unit was followed by a phase of specialization of family members: the heyday of the male breadwinner family. In this family type, married men provide family income through gainful employment, while married women perform housework and childrearing activities. In male breadwinner families, homemakers are more important than breadwinners for socialization and transmission of cultural resources (Hess and Shipman 1965; Kalmijn 1994; Marks 2008). Meanwhile, the occupation-based social status position of the family is necessarily determined by father's occupation (Goldthorpe 1983; Kalmijn 1994; Sorensen 1994). In contrast to the earlier phase, homemakers and breadwinners live in separate spheres (see e.g. Cherlin 2012; Rosaldo, Lamphere, and Bamberger 1974). Swedish children born ca. 1880-1910 underwent their own occupational careers in a male breadwinner society.

The male breadwinner family is criticized to some extent by contemporaries; during the 1930s, sociologist and politician Alva Myrdal raised the “general issue” of combining gainful employment with ‘homemaking’ activities, and thereby made the private sphere of the family public (e.g. Ekerwald and Ekerwald 2000). Relevant in this context is that this first movement to make working motherhood possible was reserved for women occupying high status positions – in practice if not in purpose. At the same time as gender questions were primarily raised at the higher end of the social structure, the demand for women's formal work was also higher here. Women were often employed in rapidly expanding occupations such as telephone operator or teacher (Dalman 2022). Children born 1935-1960 generally grew up in male breadwinner families. However, among an increasing share of the population, mothers were already combining gainful employment with motherhood. In this phase, a contrast arose between societal gender norms – propagating specialized family units, and more egalitarian gender attitudes among some dual-earner families.

The male breadwinner family type makes place for a ‘dual-earner’ family type in the 1950s-1970s (Lewis and Åström 1992; Stanfors and Goldscheider 2017). This change occurs first among married women without young children – those without a heavy childrearing responsibility, and later among those with young children.⁸⁷ In the context of long-term changes in the institutions of family and work, families

⁸⁷ It should be noted that increasing labor force participation of young mothers over these decades is partly the result of the introduction of increasingly generous family policies, especially parental leave. Thus, women may have still refrained from productive work outside of the household for a period after childbirth, but now they remained formally employed while doing so (Stanfors 2014).

with working mothers share important characteristics that differentiate them from male breadwinner and production unit families.

It should be emphasized that the extent to which social status is reflected by occupational status continues to differ even as mothers work. In early dual-earner cohorts mothers had long career breaks or entered the workforce when their children were relatively old. Mothers were also responsible for the majority of housework (e.g. Evertsson and Neremo 2004). Moreover, on average their careers differed from men's in that they attained lower occupational status (e.g. Härkönen, Manzonni, and Bihagen 2016). The labor force in which these mothers engaged is segregated by gender and women worked parttime far more often than men (Ellingsæter 2013; Lewis and Åström 1992). Despite these differences, both the occupational status of mothers and fathers, and the way in which they interact, may play a role in defining social origin.

Institutions for equal opportunities

The relationship between state, work and family life changed with the introduction of family and other welfare policies beginning in the 1930s. The relationship between employer and employee became more equal, and 'universalistic' welfare policies were introduced with the idea that everyone should benefit from the welfare state (Lindert 2004; Magnusson 2000). Early examples of such universalistic family policies are maternity (1938) and child (1948) benefits. Further family policies to alleviate child poverty and ease the combination of work and family for mothers were introduced in the 1950s and 1960s (Stanfors 2007).

In terms of gender equality in the workforce, some early progress was made with the opening of public employment and secondary education for girls and women in the 1920s, and the ban on dismissal due to marriage of women workers came in 1939 (Stanfors 2007). In the 1970s, family policies became gender neutral, in contrast to the distinct role assumed of mothers and fathers in earlier policies. Importantly, taxation became individualized in 1971 and parental leave replaced maternity leave in 1974. This was followed by further extensions of parental benefits during the 1980s. After temporal reductions during the 1990s, crisis family benefits have largely been at their 1980s levels during the 2000s, except for further efforts to increase gender equality (Stanfors 2007).

Public schooling

Developments in public schooling are especially important for intergenerational mobility of social status; in societies with widespread schooling, education is the most important mediator of the relationship between social origin and destination (Bernardi and Ballarino 2016; Jonsson and Erikson 2000; Kalmijn 1994). Public schooling was formally introduced early in Sweden (in 1842, Westberg 2019).

However, dissipation of full primary educational attainment was slow and completion of primary schooling did not become universal until around 1950 (Ljungberg and Nilsson 2009). Few were able to attend secondary or higher education before the 1950s, and such education at the time formed a marker of distinction. Enrollment in (lower) secondary schooling expanded rapidly for cohorts born after 1940 – especially with the introduction of comprehensive schooling (*grundskola*) during the 1950s and 1960s (Ljungberg and Nilsson 2009).

Despite lack of intent, early public primary schooling did equalize opportunities as increasing shares of the population became qualified for occupations with higher skill requirements (Breen and Jonsson 2007; Fischer et al. 2020). Comprehensive schooling, on the other hand, was introduced with the aim of equalizing opportunities for all children (see e.g. Husén 1989; Paulston 1966), and appears to have done so (e.g. Meghir and Palme 2005). In this study, parents to children born since the 1970s, and children born since the 1940s, will have benefited from the comprehensive schooling reform.

Who marries whom?

The level of assortative mating is important to answer the question to what extent family-level social origin affects child status attainment, as it describes the resemblance between parents in terms of social status. That is, family social origin is a function of both assortative mating and occupational attainment of each parent. Erikson and Goldthorpe (1992, p. 261) made a particularly strong claim in this regard by maintaining that information on the social status of a man is sufficient to predict “with no great inaccuracy” their sisters’ social status through marriage. That is, assortative mating on social status is deemed nearly complete and gender differences in intergenerational mobility and assortative mating negligible.

We indeed tend to marry others with a similar position in the societal social structure to ourselves. This has been true historically as well as today, despite the disappearance of formal institutions endorsing such assortative mating. Such status homogamy has historically been especially profound among high status groups who have resources to transmit intergenerationally. In nineteenth century Sweden, homogamy on social origin was indeed stronger among high status (land holding) groups (e.g. Dribe and Lundh 2005). Also more recently, (wealth) homogamy is especially profound among high status groups (e.g. in the Nordics, Wagner, Boertien, and Gørtz 2020). However, assortative mating, although substantial, is far from complete both historically and today (Dribe and Lundh 2005; Henz and Jonsson 2003). Assortative mating also differs substantially by gender. In the Swedish context, men are married to women with lower levels of educational attainment (“male hypogamy”), while women are married to men with higher levels of educational attainment (“female hypergamy”). This pattern of male hypogamy

and female hypergamy is persistent for all cohorts of parents included in this study, but did become less profound over time (see Henz and Jonsson 2003).⁸⁸

Different measures of family social origin and their rationale

Intergenerational mobility of social status is often seen primarily as a family-level, rather than individual-level, process. That is, family resources in one generation are assumed to be partly transmitted to the next generation. An individual-level approach would instead assume that each parent's resources are transmitted to the next generation independently of one another (e.g. Becker and Tomes 1979; Erikson 1984).⁸⁹ A family-level mobility approach is to be preferred over an individual-level approach as parents are likely affecting each other's economic and labor market decisions rather than acting independently of one another (e.g. Dickens and Flynn 2001). In the study of intergenerational mobility, a patriarchal perspective on social origin, where the family social status is represented by the occupation of the head of household, has long prevailed. It was criticized early on (Acker 1973, 1980; Rosenfeld 1978; Sorensen 1994) and continues to be so more recently (Beller 2009; Hout 2018; Korupp, Ganzeboom, and Van Der Lippe 2002; Thaning and Hällsten 2020).

The “dominance approach” in the class mobility literature was developed by Robert Erikson (1984) as a solution to recognized issues with the previous exclusion of mothers from class mobility studies (e.g. Watson and Barth 1964). The family would continue to form the unit of analysis, but their social status would be defined as the social class of the parent with highest status. The “dominant” parent's status is chosen using skill level, non-manual over manual, and self-employed over employee. In practice, this was mostly the father in mid-twentieth century households, but this role is increasingly often taken by the mother in more recent cohorts (e.g. Korupp et al. 2002; Meraviglia and Ganzeboom 2008). This “dominance” approach is still commonly used in studies of class mobility today, despite repeated critique (Beller 2009; Korupp, Ganzeboom, et al. 2002; Sorensen 1994; Thaning and Hällsten 2020).

There are obvious methodological benefits to using one parent rather than two, such as parsimonious modelling and no collinearity due to assortative mating (e.g. Sorensen 1994). Theoretically, pooling of resources within the household may be used as an argument to use only one parental measure reflecting both parents, such as total family income (Becker and Tomes 1979, 1986). Whereas the “dominant”

⁸⁸ More recent Swedish cohorts experience female hypogamy, but these do not form parental cohorts in this study. See e.g. Chudnovskaya and Kashyap 2020.

⁸⁹ In single parent households, the individual level and family level approach are equivalent and therefore the following discussion focusses on two parent households.

approach treats families as a patriarchal unit, the “pooled” approach treats a family as the simple sum of its parts. It is evident that not both can reflect family social origin well, as underlying assumptions are clearly distinct. An empirical evaluation of both approaches in contemporary Sweden shows that the “pooled” approach (averaging of occupational status) performs better also when it comes to occupational social status. The “pooled” approach that treats parental resources as cumulative is an improvement upon the “dominance” approach in a number of contexts, but also has its limits.

Defining social origin as the sum of fathers’ and mothers’ social (occupational) statuses assumes that parents affect child status attainment independently of each other and that distinct transmission pathways, such as cultural or economic resource transmission, are cumulative (e.g. Beller 2009). It disregards the possibility that the impact of one parent with given social status could differ depending on the social status of the other parent. Importantly, such interactions between parents may change over time with changes in the institution of family and work and changing gender norms. For example, in a male breadwinner context, specialization in the household may be positive for child outcomes (cf. Becker 1985), while it may be negative in a dual-earner context. Such interactions between parental resources are discussed in the next section.

Compensation or multiplication?

Whether the family should be seen as a unit in the analysis of intergenerational mobility and operationalized based on information for one or both parents crucially depends on our assumptions about the way in which parental resources interact. In a dual-earner family, additional resources of the second parent could affect child status attainment in the same way irrespective of the socioeconomic status of the first parent. In the case of such independent accumulation, simply pooling parental resources works perfectly well to study family-level intergenerational mobility (cf. Becker and Tomes 1979). When socioeconomic status is represented by income, it is easier to argue for such pooling than when socioeconomic status is represented by occupation or education.

If additional resources of the second parent do not affect child status attainment over and above the resources of the first parent, then the dominance approach described above will capture family origin well. The dominance approach also describes family origin well in cases where only one parent contributes meaningful resources for child status attainment. However, the effect of additional resources of the second parent may also depend on the resources of the first parent through compensation or multiplication (cf. Erola and Kilpi-Jakonen 2017). Capturing family origin then becomes more complex and cannot be done satisfactorily by either the “pooling” or the “dominance” approach.

Parental resources can interact through *compensation*, where additional resources from the second parent are more beneficial for those with *fewer* resources from the first parent (Bernardi 2012; Erola and Kilpi-Jakonen 2017; Grätz and Wiborg 2020). Compensatory accumulation could be expected at the high and low ends of the status distribution, if there are ‘threshold effects’ where differences in family resources outside of a certain range are inconsequential for child status attainment. In this case, additional parental resources do not improve child outcomes over a certain level, where all routes for intergenerational transmission of advantage have been exhausted. There may be a ‘lower threshold’ as well, under which further decreases in parental resources lead to the same expected child status attainment (e.g. because of state-level compensatory mechanisms, see Esping-Andersen 2015). Compensatory accumulation can also occur in specialized households, such as the male breadwinner family. If there is a benefit to specialization, a higher status of one parent is more beneficial at a given lower status of the other parent (cf. Becker 1985).

In contrast, parental resources can interact through *multiplication*, where additional resources from the second parent are more beneficial for those with *more* resources from the first parent (Blau and Duncan 1967; DiPrete and Eirich 2006; Grätz and Wiborg 2020). In this case we could expect that additional resources from one parent are particularly beneficial for child status attainment if the other parent also has a relatively high social status, or that fewer resources from one parent are particularly detrimental if the other parent also has few resources. Such multiplicative accumulation can be described in economic terms as a “cooperative” household unit where each parent has bargaining power and household welfare is maximized to levels above those attainable by noncooperative maximization of personal welfare (Chiappori 1992; Manser and Brown 1980). Multiplicative accumulation is also referred to as “social-multiplier effects” (Dickens and Flynn 2001), or in the extreme case where only the advantaged accumulate, Matthew effects (Merton 1968).

Moreover, assortative mating also affects the extent to which parents transmit social status to their children (Schwartz 2013). That is, a given cumulative social status of two parents may either reflect one parent with relatively high, and one parent with relatively low social status – or two parents with intermediate social status. Parents resembling each other (status homogamy) are expected to be more beneficial for child status attainment than parents who differ from each other (status heterogamy). If levels of homogamy affect child status attainment, then we can interpret this as a specific case of multiplicative accumulation. This can either be the result of multiplicative processes as described above, or the result of threshold effects where having two parents above a given threshold is more beneficial than having one parent with particularly high social status (cf. Schwartz 2013).

Gender and mobility

According to gender-role model theory, same-gender parents could play a larger role than opposite gender parents in intergenerational mobility of social status (e.g. Rosenfeld 1978). Children identify with the same-gender parent and – either through socialization or unconscious imitation – behave similarly to the same-gender parent (Boyd 1989; Kong, Maas, and van Leeuwen 2020). Such gender differences in intergenerational mobility have indeed been found in some contexts (for the US, Beller 2009).

The applicability of gender-role model theory is linked to contextual factors. In societies with both male breadwinner and dual-earner families, working mothers provide a role model function for their daughters. There is a clear mother-daughter association in labor force participation, so that more working mothers raise more working daughters (Siegel and Curtis 1963; Stevens and Boyd 1980), working outside of female-dominated occupations (Rosenfeld 1978). Gender attitudes and corresponding family types may also be transmitted intergenerationally (e.g. Luke 2021).

Whether children choose gender-segregated occupations is associated with their parent's propensity to choose such occupations. But gender segregation in the labor force in itself could also lead to more mobility among opposite gender parent-child pairs; parent and child of the same gender are more likely to end up in occupations dominated by their gender (Eriksson 2015; Korupp, Sanders, and Ganzeboom 2002). Both gender-role models and gender segregation in the labor force could thus be associated with gender differences in intergenerational mobility, where same-gender parents are more important in explaining child status attainment.

Both gender segregation of the labor market, and gender segregation in the family, were stronger and more formalized in historical contexts than in Sweden today (e.g. Janssens 2014; Widerberg 1980), and therefore gender differences in intergenerational mobility could be more pronounced historically. Changes over time in the extent to which roles in the family and labor force are gendered suggest that the inclusion of gender is particularly important when studying intergenerational mobility over a long period of time. Gender differences in intergenerational mobility could be more pronounced under the male breadwinner and production unit family types than in dual-earner families (Beller 2009; Kong et al. 2020).

Previous research

Individuals and groups in a society are ranked in one or more, stable or unstable, hierarchies of status. This process is known as social stratification, and in some form or another applies to any society. A long tradition of intergenerational mobility research has found important associations between parental social status and child social status, in particular also as represented by occupational status (Blau and Duncan 1967; Ganzeboom and Treiman 2003; Hauser and Featherman 1977; Hauser and Warren 1997). The study of intergenerational mobility has to a large extent been descriptive. Whether the intergenerational association in social status reflects intergenerationally transmitted economic, cultural or social resources, personal traits such as cognitive ability, or some of each of these or yet something else, remains a matter of debate (see e.g. Morgan, Grusky, and Fields 2006). The combined intergenerational mobility of occupational and homemaker status of mothers and fathers likely reflects different mechanisms than father-child mobility alone.

In recent years, several important contributions have been made to the study of intergenerational mobility considering both the role of fathers and mothers. There are early studies of father/mother intergenerational mobility (e.g. Rosenfeld 1978), especially before the introduction of the dominance approach (Erikson 1984). Theoretical and empirical limitations with the prevailing “dominance” approach have been raised repeatedly (e.g. Korupp, Sanders, et al. 2002; Sorensen 1994). Studies evaluating the intergenerational transmission of both parents and children by gender have also been done with respect to income mobility (Ahrsjö, Karadakic, and Rasmussen 2021; and on a limited scale Fertig 2003). However, it was not until a study by Emily Beller (2009) that the impact of mothers was brought back on the agenda of mainstream social stratification research. Beller shows that in a contemporary US context, both mothers and fathers impact child status attainment and found no interaction effects between the two parents — an additive model of mobility including fathers and mothers separately performed just as well as a multiplicative model (Beller 2009). Beller also finds that intergenerational mobility patterns differ for sons and daughters. She finds an increasing impact of mothers over time. As a result, intergenerational mobility has been overestimated for recent cohorts in studies using the dominance approach (Beller 2009).

The impact of both parents on child status attainment in modern-day Sweden has been studied using sibling correlations (Thaning and Hällsten 2020). The ‘dominance’ approach to social origin is still dominant in sociological literature, despite performing worse than several other alternatives. A measure including the social origin of both parents, as well as an interaction between parents, is best able to explain sibling correlations in social status. Alternatively, the average social status of both parents is suggested as a more parsimonious measure of social origin, capturing family background reasonably well (Thaning and Hällsten 2020). A main

contrast between this study and the current, beside the longer time frame, is the inclusion of gender here. Thaning and Hällsten find that models distinguishing parents by dominance (highest/lowest status) explains intergenerational mobility of especially education (but also occupation and earnings) better than distinguishing parents by gender (father/mother). They also find some evidence for such multiplicative accumulation of both parents' social origins (see online appendix to Thaning and Hällsten 2020). These findings are based on child status attainment not separated by gender, i.e. sons and daughters are not studied separately. It therefore remains an open question whether this finding applies for both sons and daughters.

In a recent study, the family type transition from male breadwinner to dual-earner is shown to have reduced mother-child income mobility and thereby parent-child income mobility, despite father-child income mobility remaining constant for 1951-1979 birth cohorts in Sweden, Denmark and Norway. Thus, an observed overall reduction in income mobility over this period in Scandinavia does not necessarily reflect reductions in the transmission of 'underlying' socioeconomic status, but rather an increase in the extent to which family income reflects both fathers' and mothers' broader socioeconomic status. A similar trend – although less pronounced – is observed also in the US (Ahrsjö et al. 2021). Given distinct patterns of occupational and income mobility in the Scandinavian countries (Breen and Jonsson 2005; Breen, Mood, and Jonsson 2016; Karlson 2021), it is interesting to study this transition also using occupational status. All the more so as the transition from male breadwinner to dual-earner society likely impacted the occupational status of families more strongly than household income, e.g. if breadwinner fathers, on average, work more hours than dual-earner fathers.

Intergenerational mobility of mothers' social status has barely been studied for historical settings. In the context of the nineteenth century Netherlands, mothers' occupational and homemaker status are found to be relevant (Kong et al. 2020). Having a homemaker mother was positively associated with child status attainment, especially for sons. In this historical context, substantial gender differences in intergenerational mobility are found, with the father-son association being strongest. Over time, father-daughter mobility is found to have increased (Kong et al. 2020). Differences in intergenerational mobility of social status by family type have been addressed mostly for the US context. Breadwinners are found to impact child status attainment more than men in dual-earner couples (Fischer and Hout 2006), while the role of homemakers seems to vary based on other factors (Beller 2009; Brea-Martinez 2022). Previous research has not yet addressed long-term patterns and trends in two-parent mobility as society transitioned from the agricultural production unit, to the male breadwinner, to the dual-earner family type. A large literature shows that gender differences in intergenerational mobility exist among children and change over time (with changes in family type, gender norms and structural development, see e.g. Olivetti and Paserman 2015; Torche 2015).

Any two-parent approach to intergenerational mobility must carefully consider the role of assortative mating in intergenerational mobility, as this will be reflected in the social origin measure used. The impact of assortative mating (in the child generation) on intergenerational mobility of social status has been studied empirically in the American and European context and is found to vary over time and space (Choi et al. 2020; Ermisch et al. 2006; Holmlund 2022). In the Swedish context, declines in assortative mating have not contributed substantively to increasing intergenerational mobility (Holmlund 2022). The same study finds that gender differences in the earnings distribution, together with given levels of non-negligible marital sorting, are important in determining levels of intergenerational mobility (Holmlund 2022). This conclusion can likely be generalized to gender differences in the occupational structure, which change substantially as Sweden transitions from a male breadwinner to a dual-earner society. Thus, based on previous research I do not expect changes in levels of assortative mating to define patterns and trends in intergenerational mobility. Other previous work on two-parent mobility has neither had the impact of assortative mating in the parental generation as its focus.

I estimate intergenerational mobility of mothers and fathers by social origin to see whether parents matter at different points in the social structure and to explore processes of accumulation of parental resources. There is a broad literature on wealth and income mobility and their differing rates of intergenerational persistence at different points of the distribution. Wealth and income are more persistent at the (very) high end of the distribution (Adermon, Lindahl, and Palme 2021; Björklund, Roine, and Waldenström 2012). Previous research has covered how wealth, income, occupational status and other indicators of socioeconomic status differ in their role in overall intergenerational mobility (e.g. Hällsten and Thaning 2021). It is however not clear from previous research whether occupational status would also be transmitted more strongly at the high end of the social structure, and there are both methodological and theoretical reasons for this uncertainty.

In practice, detailed differentiation on an occupational status scale is often lacking among high-status occupations (see also Blanden 2013). Intergenerational persistence at such a detailed level will therefore not be captured by intergenerational social status mobility measures. Theoretically, high income and wealth persistence at the top can be related to processes not reflected by occupational attainment, such as inheritance or geographical income inequalities. Other possible explanations of high income and wealth persistence, relating to intergenerational transmission of educational attainment, ability more broadly, and social networks (e.g. dynastic social capital), can result in high intergenerational mobility of social status as well as economic resources. Thus, I cautiously expect lower intergenerational mobility of social status at the higher end of the social structure, but less so than for income and wealth mobility.

Synthesis

This section is a synthesis of theories, previous research and contextual factors and the resulting hypotheses which are tested empirically in this paper. I formulate different expectations on intergenerational mobility by gender and by family type (at the societal as well as family level).

I expect the impact of mothers and parents on child status attainment to depend on the contemporary context of family and work. Processes of accumulation and multiplication in intergenerational mobility are likely relevant but also dependent on the societal family type context. In societies where families as production units dominate, the occupational status of both parents is perfectly correlated and necessarily well represented by the head of household. In societies where a substantial share of parents form male breadwinner family units, the major distinction will be between specialized and non-specialized households. In such societies, the social position of homemakers relative to the gainfully employed or those in production units will matter for intergenerational mobility of social status. In these societies, the social status of homemakers may also depend upon, but not fully mirror, the social status of their partner. Unlike in production units, the parents in male breadwinner families perform clearly distinct tasks in distinct spheres. For example, a homemaker mother may increase the propensity for her children to become homemakers or engage in similar formal work such as childcare services, irrespective of the father's occupational status. Moreover, the strength of the father-child status association likely depends on their partners occupational or homemaker status (as also found in Fischer and Hout 2006; Hout 2018).

The influence of homemaker mothers on child status attainment will be associated both with the social status of her partner (which due to assortative mating partly reflects the mothers' social origin), and on prevailing gender and family norms. A previous study on two-parent mobility suggest just this, that the category of homemaker mothers is highly diverse and therefore their impact on child status attainment varies (Beller 2009). The inclusion of non-occupational measures of socioeconomic status would be necessary to capture intergenerational transmission of overall socioeconomic status from homemaker mothers to their children and should be expected to be less strongly homemaker status associated with child status attainment than occupation-based social status. The influence of a working mother's occupational status on child status attainment similarly depends upon prevailing gender and family norms. Her labor market attachment and thereby the extent to which a mother's broader socioeconomic status is reflected by her occupational status differs between these contexts.

Concretely, I summarize the hypotheses addressed by the results section below.

Net of father social status, I expect mother social status to be associated with child status attainment – and increasingly so over time. Based on previous research and

theory on intergenerational mobility, the occupational social status of working mothers likely affects child status attainment both historically and today. Based on work on assortative mating in combination with increases in women's labor force participation, I expect the intergenerational association between fathers and their children to be attenuated when mother's social status is controlled for, and increasingly so over time. This would imply that father-son associations are a bad representation of long-term intergenerational mobility trends among fathers and sons, as well as among both genders.

In line with theory as well as previous empirical research and policy goals, I expect intergenerational mobility to increase as institutions for equal opportunities (the welfare state, public schooling, family policies) expand. In contrast, I expect overall intergenerational mobility (of occupational status) to decrease as mothers' labor force participation increases. I expect this to happen 'mechanically' because mothers' social status becomes better represented by occupational information, but also substantively because mothers become more important in the intergenerational transmission of social status as societal norms change. This means that I expect to see an increase in the intergenerational association between mothers and their children both among dual-earner families and in the full population.

Theory and previous research indicates gender role model effects in intergenerational mobility, especially historically. Moreover, gender-segregated labor markets likely result in stronger associations between same-gender parents than opposite gender parents. I therefore expect same-gender parents to affect child status attainment more than opposite gender parents, but decreasingly so over time as gender norms converge. Consequently, I expect father-child mobility to consistently be higher for daughters than for sons. I also expect two-parent mobility to be higher for daughters than for sons as long as women have weaker attachments to the labor market than men, as men's occupations in this case reflect social status better than women's occupations. I expect this difference to be related to labor market attachment and disappear for cohorts where men and women have similar participation levels across adulthood (children born after ca. 1970 in Sweden).

Father-child mobility is likely lower in male breadwinner families than in dual-earner families; in male breadwinner families overall, social origin is reflected to a larger degree by fathers' occupational status. I expect this breadwinner effect to disappear as Sweden becomes a dual-earner society; once this transition is completed, the social status of non-working mothers is no longer defined by their partner but rather by their own occupational attainment.

Expectations on the role of homemaker status for child status attainment are complex. It will mostly reflect selection into the category of homemaker. In early male breadwinner society, being a homemaker is desirable and therefore I expect a positive association between having a homemaker mother and child status attainment for cohorts born until 1910, growing old in a male breadwinner society,

in line with previous research. As married women and mothers' labor force participation increases, first among the higher-educated, homemaker status will reflect not belonging to this frontrunner group and therefore I expect a negative association between homemaker status and child status attainment in cohorts born from 1935. In cohorts born after 1970, where homemaker status no longer exists and is better described as being outside of the labor force or unemployed, I also expect a negative association.

Whether intergenerational mobility of occupational status differs by social origin is not well established, but economic mobility (of both wealth and income) is known to be lower at the top of the distribution. I expect such differences across the social structure to be smaller for intergenerational mobility of occupational status than for economic mobility, if they exist at all. Importantly, I expect variation by social origin to change over time for mothers. I expect mother-child associations to first increase among families with higher status origins, who transition from male breadwinner to dual-earner family types earlier.

In line with previous research on contemporary Sweden, I expect to see multiplicative accumulation of mothers' and fathers' social status within dual-earner families in a dual-earner society. That is, given one parent's resources (social status), I expect additional resources from the other parent to matter more as resource levels of the first parent increase. This would imply that the total intergenerational transmission of the occupational status of both parents is larger than the sum of the two parent-child associations for those with higher-status family backgrounds. I expect accumulation of parental resources to occur across the social structure.

In line with specialization theory, I expect compensatory accumulation of mothers' and fathers' social status within dual-earner families in a male breadwinner society. That is, I expect additional resources of the other parent to matter more as resource levels of the first parent become *lower*. Also in this context, I expect accumulation of parental resources to occur across the social structure.

Data

In this study, I use administrative data in the form of full-count censuses conducted every 5-10 years, and continuous registers. Historical censuses (1880, 1890, 1900, and 1910) are excerpts from continuous parish registers compiled by priests. The information in the censuses is therefore more reliable than contemporary self-reported censuses in other contexts, which suffer more from recall bias (Swedish National Archives 2011a, 2011b, 2014, 2016). Information in the censuses is organized at the individual as well as household level. Children are observed in the parental household with a recorded family relationship, used here to define intergenerational cohorts. The historical censuses, in combination with later censuses, are used to define historical cohorts of children born 1865-1910 and their children. Individuals have been linked longitudinally across the historical censuses and to the Swedish Death Book – a source including personal identifiers introduced in 1947 – by Björn Eriksson using probabilistic name linking methods (as elaborated in Dribe, Eriksson, and Scalone 2019; Eriksson 2015). The historical cohorts are linked to the 1950 census and modern data at Statistics Sweden using personal identifiers. This link provides occupational information in adulthood for children born after ca. 1885 as well as some young parents to 1900s cohorts.

From 1935 onwards, children and their parents are registered in multigenerational registers at Statistics Sweden (SCB).⁹⁰ For cohorts born 1935-85, parent-child links are based on these multigenerational registers, and presence in Sweden is retrieved from the register of the total population (RTB) also at Statistics Sweden. These cohorts and their parents are followed across the 1950 poll-tax register (compiled by county administrations), the 1960-1990 censuses (containing self-reported information), and the 2001-2016 occupational registers (with information reported by employers).

The 1950-90 census material is better suited to the study of intergenerational mobility of social status, as occupational information is more complete and does not necessarily reflect current employment at a specific point in time. The occupational registers miss information on non-salaried employers, project employment, and most small employers and self-employed (<3 employees). This results in attrition both at the high and low end of the social structure. Coverage is better for the public than private sector, better for women than men, and better for Swedish-born than foreign-born (Statistics Sweden 2011).⁹¹ I make occupational information more

⁹⁰ The modern register and census data used here are part of the Swedish Interdisciplinary Panel (SIP), a compilation of different official register and censuses starting in 1960 (hosted at the Centre for Economic Demography, PI: Jonas Helgertz).

⁹¹ The exclusion of small employers and the self-employed results in missing information for many foreign-born workers. Moreover, return migration of temporary foreign workers is under-registered in the register of the total population. To make mobility estimates more consistent over time, I therefore exclude foreign-born workers from the sample on which the main analyses are

consistent across registers and censuses by including annual information from the occupational registers, while census information is less frequent. This compensates to some extent for the lower coverage in the registers.

Occupational information is recorded in string format in the 1880-1950 census data. These occupational strings are recoded into HISCO (Leeuwen, Maas, and Miles 2002) within the SwedPop project (www.swedpop.se). By using string descriptions of official occupational coding in the 1960-1990 censuses and ISCO coding of occupational registers, HISCO codes were appended also to modern occupational source data (originally in NYK-78, NYK-83, SSYK-96 and SSYK-2012 format). Besides NYK codes, the 1960-1990 censuses also include a socioeconomic index variable (SEI, Statistics Sweden 1982, 1989). I use a new translation key (Dalman 2022) to link each NYK-78 + SEI combination to a HISCO code. This key places greater emphasis on hierarchical and skill-level differences than earlier more indirect routes from NYK to HISCO. I use existing translation keys by Erik Bihagen (Bihagen 2007) to match 2001-2016 occupational information to HISCO codes.

To be included in the study sample, children must be observed themselves in their parental household at age 14 or younger (historically) or observed in the multigenerational register (contemporary), and at least once at age 25 or later (both sources). Moreover, at least one of their parents must be observed in Sweden in adult age – historically this is automatically fulfilled by observing the family after childbirth. Appendix table A.1 summarizes the selection process from source data to the analytical sample. In short, about half of individuals in the selected birth cohorts can be included based on described selection criteria for 1865-1910 birth cohorts, while 80-90% of individuals can be included for 1935-1985 birth cohorts. In the 1935-85 cohort, most of these children have an observed occupation at some point in time (> 95% of both sons and daughters), and sons in historical cohorts reach similarly high levels. In contrast, only about one in three daughters has an observed occupation historically. Analyses of intergenerational mobility are (necessarily) only based on the children for which occupational information is observed.

performed, but appendix figure A.1 shows main mobility patterns by parent and child gender also among the full population including foreign-born. Overall patterns are very similar to those presented in the paper, except for stronger increases in mobility among men in the most recent cohorts of the full population. These increases likely reflect the difficulty to capture the social status of foreign-born workers.

Study Design

I model the association between occupational status of both parent's and child's status attainment using intergenerational rank correlations in a continuous occupational status scale (cf. Holmlund 2022). A model including both parents is somewhat more complex than a model with only one indicator of social origin, especially if non-linearities and the interaction between parents are considered, therefore a parsimonious status indicator such as a continuous occupational status scale is preferred over social class. The below equations summarize the different regression models I estimate. In the general models (equation 1-3), an interaction splits the estimated intergenerational associations by child gender. Models on heterogeneity by social origin and accumulation (equation 4-6) have also been estimated by child gender, but as patterns of heterogeneity and accumulation do not differ by child gender, simplified models are shown here for ease of interpretation and visualization.

Two-parent intergenerational mobility:

$$Child\ occupational\ status\ (CO) = \beta_0 + \beta_{1-2}G * FO + \beta_{3-4}G * MO + \beta_5 * G + C\beta + e$$

Equation 1

Father-child intergenerational mobility:

$$Child\ occupational\ status\ (CO) = \beta_0 + \beta_{1-2}G * FO + \beta_3 * G + C\beta + e$$

Equation 2

Intergenerational mobility by family type:

$$CO = \beta_0 + \beta_{1-4}ME * G * FO + \beta_{5-8}ME * G * MO + \beta_9ME * G + \beta_{10}G + C\beta + e$$

Equation 3

Intergenerational mobility by social origin:

$$CO | MO, FO \in (a, b) = \beta_0 + \beta_1FO + \beta_2MO + \beta_3 * G + C\beta + e$$

Equation 4

Accumulation father-child:

$$CO | MO \in (a, b) = \beta_0 + \beta_1FO + \beta_2MO + \beta_3 * G + C\beta + e$$

Equation 5

Accumulation mother-child:

$$CO | FO \in (a, b) = \beta_0 + \beta_1MO + \beta_2FO + \beta_3 * G + C\beta + e$$

Equation 6

where F = father, M = mother, O = occupational status, G = gender child, E = employment, C = other controls, and (a,b] is a percentile range. In each specification, the variables of interest are highlighted in bold.⁹² The models show ‘gross’ intergenerational associations and only include temporal control variables, reflecting occupational maturity of parents and children: mother’s and father’s age at birth of the focal child and age at observed highest occupational status of the child.⁹³

The explanatory variables of interest are father and mother occupational status by child gender, by family type, by the combined family social origin, and by the other parent’s social status (accumulation). I distinguish family types using mother gainful employment when the focal child is aged 0-10 (cohorts 1935-1985), and as observed in any census (cohorts 1865-1910).^{94,95} The outcome variable is child occupational status. Both parental and child occupational status are rank-transformed and standardized to control for structural changes in the occupational structure.⁹⁶ Parents who are never observed as working in the census and register material are assigned the median occupational status for that birth cohort and do not contribute to the measured intergenerational correlation.

Appendix table A.2 shows the distribution of occupational status variables and temporal control variables over different cohorts by child gender and among

⁹² As I model everything on the individual level, suffixes are excluded from the above formulas for simplicity.

⁹³ I do not control for educational attainment or other relevant demographic and geographic differences, but instead study the total association between occupational social origin and child status attainment. Educational attainment changed fundamentally between cohorts studied here – with educational attainment being minimal for early parental cohorts. Moreover, the nature and purpose of schooling changed and thereby likely also the nature of the mediating role of education in intergenerational mobility. I abstract from this and other societal developments to see to what extent, in different contexts, parental occupational status is associated with child status attainment.

⁹⁴ Mothers’ employment is measured at the end point of each birth cohort, this means when the focal child is aged 14-0 for the cohorts born 1935-49 (respectively), and when the focal child is aged 9-0 for each subsequent decade (5-0 for those born 1980-85). Depending on number of siblings and birth order this reflects different situations at the time of observation, but this does not appear to result in consistent biases in the mobility estimate.

⁹⁵ When referring to ‘employment’ in this paper it is consistently defined as having a recorded occupation in censuses or registers. This is the only possible employment measure in historical cohorts and is for consistency used also in more recent cohorts. For a comparison between census-based employment rates and high-quality data on labor force participation since 1968 from Labor Force Surveys, see Dalman 2022; Stanfors 2014).

⁹⁶ Rank-transformed continuous variables are standardized automatically if the range of values taken is sufficiently large, but it is not here – especially among women in early cohorts (often domestic servants). By standardizing the occupational status variable, standard errors are aligned better across cohorts, gender and generations. Differences in variation in the occupational structure cannot completely be controlled for in historical cohorts.

working children. While working daughters are negatively selected in the Dutch context in a similar period (e.g. Kong et al. 2020), they are both overrepresented at the high and low end of the social structure in the Swedish historical cohorts. Mothers of working daughters are more likely to work than mothers of non-working daughters, reflecting intergenerational transmission of women's labor force participation (cf. Stevens and Boyd 1980), but such differences are rather small.

Occupation-based social status

In the intergenerational mobility literature, social status is commonly defined using either social class belonging or occupational prestige on a continuous hierarchical scale. Certain social class distinctions relevant for intergenerational mobility cannot be reduced to a one-dimensional hierarchical scale, and the use of log-linear modelling of class mobility tables is common both in the broader literature and when studying mothers and mobility (e.g. Beller 2009; Breen and Müller 2020; Erikson and Goldthorpe 1992; Kong et al. 2020). However, there are substantial challenges to applying a consistent class scheme to men and women in a gender-segregated workforce – with most of the prevalent class schemes better suited to capture social distinction among men (e.g. Le Grand and Tåhlin 2017; Sorensen 1994). Two-parent mobility has also been studied using occupational status scales rather than social class (Thaning and Hällsten 2020). Although using a hierarchical occupational prestige scale abstracts from certain dimensions of social stratification, it facilitates a comparison of mobility levels over time and by gender, family type, and social origin. I am able to straightforwardly generate one summary metric reflecting intergenerational mobility, split it along relevant lines, and control for structural change. Estimating processes of accumulation also becomes straightforward with this operationalization of occupational status.

Unlike income or educational attainment, occupational information is consistently available in censuses over the long period studied here. Moreover, educational attainment and variation therein were low in the historical context studied here. These are the practical reasons to prefer this indicator of socioeconomic status. There are however several substantive reasons why occupation is a good measure to study how intergenerational mobility is affected by the changing relationship between work and family.

The different family types distinguished are characterized by differences in the type of productive work performed by mothers, and these are directly reflected in their occupational status. Income changes of families and mothers reflect changes in family policies and family norms in complex ways, for example through transfers but also through changing marriage premia (Torche and Abufhele 2021). In comparison to life-course changes in income, career mobility in mature ages is rather small (Form and Miller 1949; Neal 1999; Nybom and Stuhler 2016). Career mobility increases over cohorts and the timing of occupational maturity depends on gender and childbearing (Bihagen, Shahbazian, and Kjellsson 2022; Härkönen et al.

2016; Schulz and Maas 2012). I abstract from these changes over time and by gender by using highest occupational status attainment across the life-course rather than occupational attainment at a given age.

I operationalize occupational status using the HISCAM scale, which is the historical counterpart to the modern CAMSIS scale (Lambert et al. 2013; Prandy and Lambert 2003). To define social status on the HISCAM scale social networks as reflected by marriage certificates are used. Depending on the frequency at which individuals occurring on the same marriage certificate (e.g. father and son in law) have certain occupations, these occupations are defined as socially more or less distant. Social distance is thus defined as the likelihood of occupations meeting on a marriage certificate. The HISCAM occupational status scale is generated using marriage certificates over the period 1800-1938 from seven countries, including Sweden (Lambert et al. 2013).⁹⁷ The distribution (mean and standard deviation) of HISCAM among parental and child cohorts is shown in appendix table A.2, separated by gender. Occupational upgrading among cohorts of children is strongest over 1865-1935 birth cohorts, while upgrading among parents is strongest among later cohorts (children born in the twentieth century). This reflects expected generational differences, but lower occupational status among recent child cohorts also reflects that these cohorts have not yet reached occupational maturity when observed (Bihagen et al. 2022).

As a proxy for homemaker status, women's occupational information is used. Most mothers to child cohorts born after 1950 are at some point observed as working, while I observed working status in half of the 1935-1950 birth cohorts and only 10-25% of mothers to 1865-1910 birth cohorts (see appendix table A.2). The share of mothers working with children under age 10 or 15 is much lower for all cohorts. It is almost negligible for 1865-1910 birth cohorts, at about 1 percent. For 1935-1950 birth cohorts, it increased to 1 in 10, and for children born in the 1970s to 6 in 10, and fully converges to father's employment share for cohorts born in the 1980s (8 in 10). I define homemaker status historically, for child cohorts born until 1910, as mothers who are never observed as working (either before or after marriage). Most non-homemakers historically work in domestic service before marriage, but some

⁹⁷ For both men and women, I use the universal version HISCAM scale (version 1.3.1.U2) which is based on *male* occupations. While there exists a HISCAM scale based on both male and female occupations, the U2 version is the "recommended" version and has therefore been applied most frequently in earlier studies. I believe that it is preferable to use the same HISCAM scale for men and women so that men and women with the same occupation are seen as having the same occupational status (for example in marital sorting). The HISCAM scale including social connections regardless of gender (version 1.3.1.U1) is dominated by bride to parent (in law) relationships, as married women are often not registered as occupied except in the Netherlands and Flanders, and not at all in the Swedish HISCAM data (see table 1 in Lambert et al. 2013). Thus, proximity between occupations becomes particularly conflated with age and life course in the mixed sample. I thus prefer to use the 'recommended' male version of HISCAM over the universal version, especially for the Swedish case.

work for example as teachers later in life. For cohorts born after 1935, the meaningful distinction is whether mothers do or do not work when they have young children. I define the latter as homemakers.

Limitations

The occupations of parents and children to 1935-75 birth cohorts are observed in prime working age and across much of their adult life, at least until the age of 40. Children born from 1975-85 are observed relatively early in their career (in or before 2016), and in current-day Sweden this means that many of them have not yet reached their highest occupational status yet – unlike their parents (Bihagen et al. 2022). I therefore expect a gradually increasing downward bias in the observed intergenerational association over these cohorts.

Historically, occupational information is regularly observed through 1880-1910, so that the social status of 1865-80 birth cohorts is well covered. The major difference here is that occupational attainment at age 30 in 1910 (instead of 2016) reflects highest attainment over the life-course rather well; career mobility after this age is rather small in the early twentieth century (e.g. Form and Miller 1949; Neal 1999; Schulz and Maas 2012). I do not have access to full-population censuses between 1910 and 1950, and therefore my estimates for 1880-1910 birth cohorts should be taken with caution. For these cohorts, the occupational information for parents is often observed before 1910, at relatively young ages. The occupational information for children is either observed at young ages (25-50 for 1880-85 birth cohorts), or at rather high ages in 1950. As the Swedish occupational structure changes substantially between 1910 and 1950, the occupations of parents and children do not reflect the same life-stage, nor the same occupational structure. I therefore expect the intergenerational associations estimated for 1880-1910 birth cohorts to be biased downwards.

Results

The results are divided over five sections. The first section addresses mobility levels and long-term trends by parental and child gender. The second section relates father-child mobility measures, as often used in the literature on long-term mobility trends, to two-parent mobility measures. The third section covers different family types and their mobility patterns and trends. This includes the status of breadwinners, homemakers and dual-earners, and gender differences related to family type. In the fourth section, mobility levels given different family-level social origins are covered to see where in the distribution mothers and fathers matter. Section five addresses the specific contribution of either fathers or mothers, given the other parent's social status. This is used to address accumulation of parental resources, or the way in which the status of both parents interacts to shape family social origin.

Mobility patterns and trends by gender

In this section, I describe overall patterns and trends in intergenerational mobility using a two-parent model split by child gender (equation 1 in study design). The results of this analysis are summarized in figure 2. Figure 2 shows father-son (blue solid), father-daughter (grey dashed), mother-son (green double), and mother-daughter (red dashed and double) rank-rank associations in occupational status for all birth cohorts (x-axis). These associations are based on a model including all parent-child pairs simultaneously and depict the net contribution of a given parent-child pair.

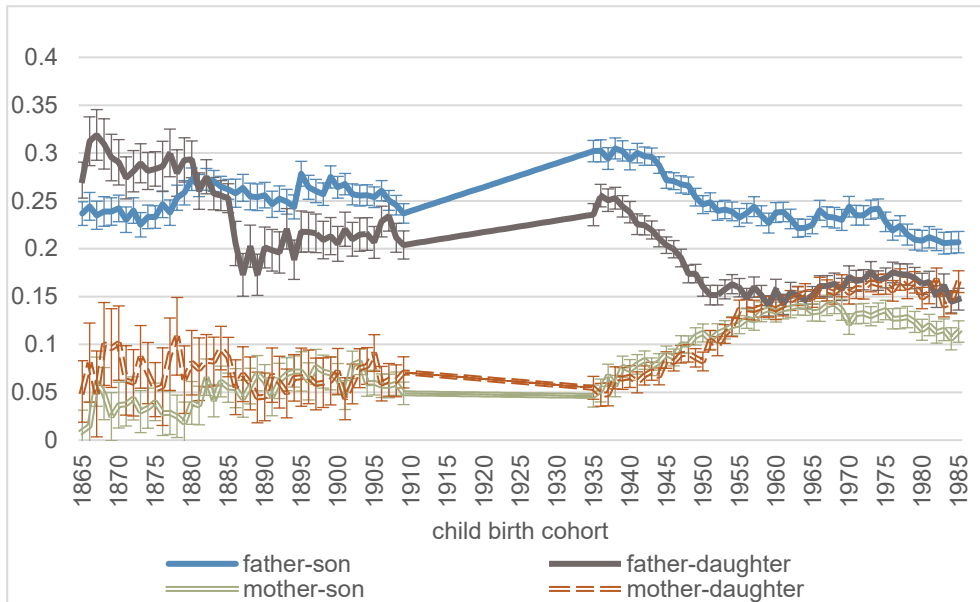


Figure 2: Parent-child rank-rank associations in occupational status (HISCAM) by parental and child gender, over cohorts of children born in Sweden 1865-1985. Based on equation 1 in study design.⁹⁸

The figure shows rather stable levels of intergenerational mobility across 1865-1935 birth cohorts.⁹⁹ A major shift occurs over 1935-50 birth cohorts. These cohorts grow up as society transitions from male-breadwinner to dual-earner. Mothers' status increasingly describes child status attainment, while the explanatory power of fathers' status is reduced. The mother-child association continues to increase over cohorts born in the 1950s, but father-child associations have stabilized by then. All parent-child associations decrease among 1975-85 birth cohorts. This is likely a data-driven rather than a substantive result, as children are observed at increasingly young ages at which occupational maturity is not yet reached (Bihagen et al. 2022).

There are no clear gender differences between working sons and daughters in 1865-1910 birth cohorts. Father-child associations fluctuate around 0.25, and mother-child associations fluctuate at low levels around 0.07. The associations reflect about one-third of all daughters in these cohorts, but all sons. I expected to see clear gender

⁹⁸ For comparison of mobility levels over the long term, see sections on data and study design for varying data limitations.

⁹⁹ The substantial drop in the father-daughter association for cohorts born after 1885 is likely data-driven; occupations of these daughters are observed at high ages in 1950 or afterwards, while occupations of fathers are observed in 1910 or before – at relatively young ages. It is rather surprising that a similar drop is not seen in father-son associations.

differences in this period and see them in participation levels but do not see them extended to different intergenerational mobility levels.

From 1935, gender differences in parent-child mobility are apparent and increase substantially over time. They first increase through fathers (1935-50), and then increase through mothers (1960-75). After 1950, father-daughter associations (ca. 0.16) are substantially lower than father-son associations (ca. 0.24). Mother-child associations are virtually the same across 1935-1960 birth cohorts. By 1975, mother-daughter associations are at the same level as father-daughter associations (ca. 0.17). Mother-son associations are closer to 0.13 – only half the size of father-son associations.

Mobility trends over time also differ by gender after 1935. In 1935-50 birth cohorts, I observe a more rapid reduction of the father-daughter association than of the father-son association. Mother-child associations do not differ by gender, so that daughters overall become relatively more mobile than sons over this period. In subsequent 1960-75 birth cohorts, I see the opposite pattern; here mobility among daughters decreases but not among sons. It is not certain whether this divergent mobility trend by gender since 1960 is substantive or data-driven; occupations are observed in the occupational registers which cover women's work better than men's.

Gender differences in intergenerational mobility – among the working – thus increase rather than decrease over time. This could be related to the changing selection into work among daughters and mothers. Unpaid care provided by homemakers has been translated into female-dominated formal work, increasing occupational gender segregation of the (expanded) workforce.

Father-child mobility in the long run

In this section, I compare a father-child model of intergenerational mobility to father-child associations from a two-parent model (equation 1 vs 2 in study design). The results of this analysis are summarized in figure 3. Figure 3 shows father-son (blue solid) and father-daughter (grey dashed) rank-rank associations in occupational status in a darker and lighter shade. The dark shade reflects estimates based on a father-only model, while the light shade reflects estimates based on a two-parent model. The difference between the light- and dark-shaded lines can be seen to reflect the part of mother-child associations in occupational status that is incorrectly attributed to fathers (through assortative mating) if mother's occupational status is not observed.

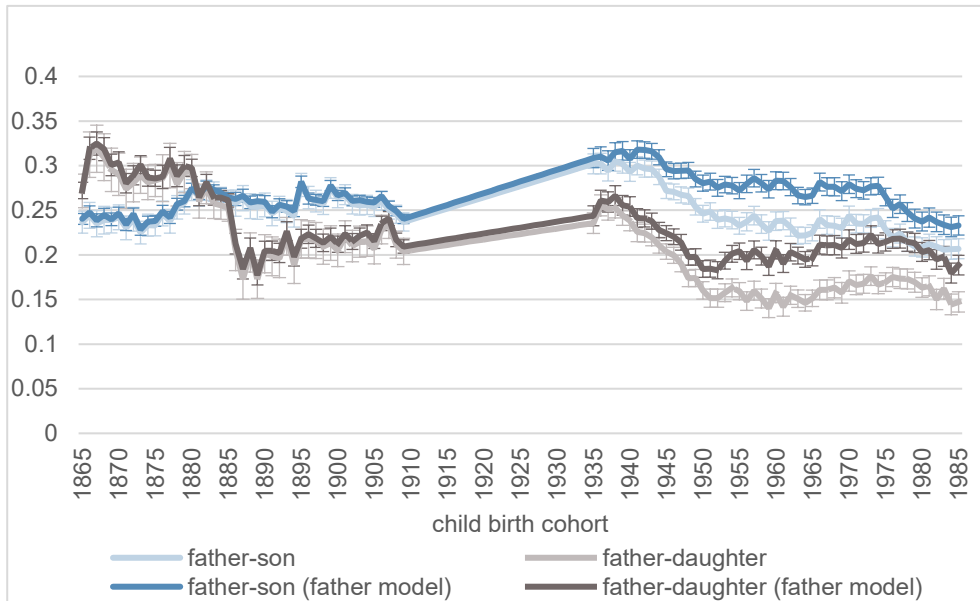


Figure 3: Father-child rank-rank associations in occupational status (HISCAM) by child gender, over cohorts of children born in Sweden 1865-1985. Based on equation 1 (light shade) and 2 (dark shade) in study design.¹⁰⁰

For 1865-1910 birth cohorts, the use of only fathers' occupational status in the study of long-term mobility trends is defensible; while there is an association between mothers' occupational status and their children's attainment (in figure 2), this association is rather small. More importantly, father-child associations from a father-only model give the same mobility levels as father-child associations from a two-parent model. They accurately reflect trends in father-child mobility.

For cohorts born since 1935, father-child associations in a father-only model gradually diverge from associations based on a two-parent model. Father-child associations are overestimated and to an increasing extent reflect mothers' occupational status as mothers' labor force participation increases. However, father-child associations only partially reflect mother-child associations. Therefore, time trends in father-child associations do not reflect overall time trends in intergenerational mobility of social status once a substantial share of mothers has their own occupational status. As mothers are more important in explaining daughters' status attainment, and fathers more important in explaining sons' status

¹⁰⁰ For comparison of mobility levels over the long term, see sections on data and study design for varying data limitations.

attainment, a father-only model also gives a distorted picture of gender differences in mobility.

Mobility patterns and trends by family type

Figures 1 and 2 show intergenerational associations for both dual-earner and male breadwinner/production unit families. Historically, the latter family types dominate. For example, among 1865-80 birth cohorts, only 10% of families are classified as dual-earner with observed occupations both for mothers and fathers. In 1935-50 birth cohorts, half of mothers are observed as working at some point in time, but only 10% when the focal child is aged 0-14. By the 1970s birth cohort, the majority of mothers (60%) are observed as working 0-9 years after the birth of the focal child (see table A.2 for further descriptives).¹⁰¹ The overall mobility patterns therefore reflect different types of families at different points in time. In this section, parent-child associations are split by family type to see whether patterns and trends differ along these lines. Figures 4a-b show parent-child associations following the same color coding and line type as used in figure 2. Associations among male-breadwinner families are shown in a darker shade, and among dual-earner families in a lighter shade.

¹⁰¹ As societal norms and conventions change, and as we observe occupational status more rarely historically, the male breadwinner vs. dual-earner distinction is made differently historically (cohorts born until 1910) and contemporarily (cohorts born since 1935). Families are classified as dual earner if mothers are ever observed as working for 1865-1910 birth cohorts, and if mothers are observed as working when the focal child is aged 0-9 for 1935-1985 birth cohorts. See discussion on this in the study design section.

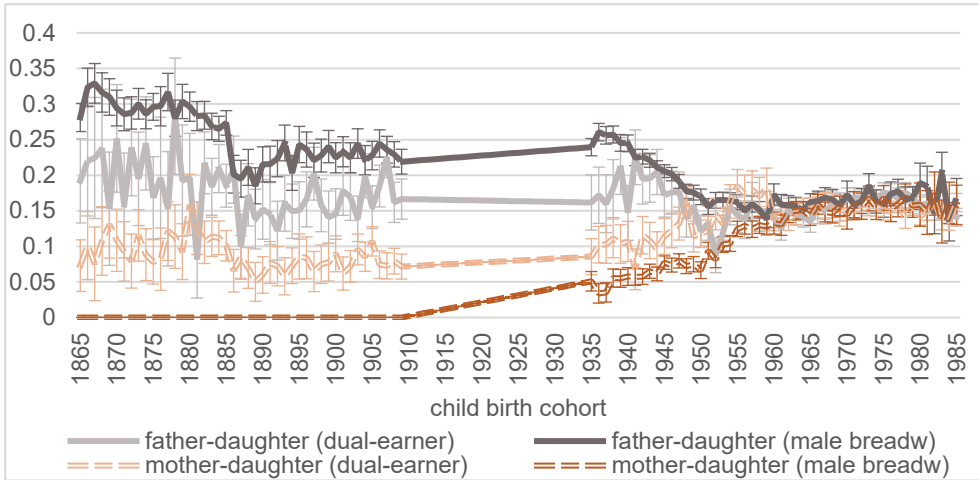


Figure 4a: Parent-daughter rank-rank associations in occupational status (HISCAM) by parental gender and by family type. Cohorts of children born in Sweden 1865-1985. Based on equation 3 in study design.¹⁰²

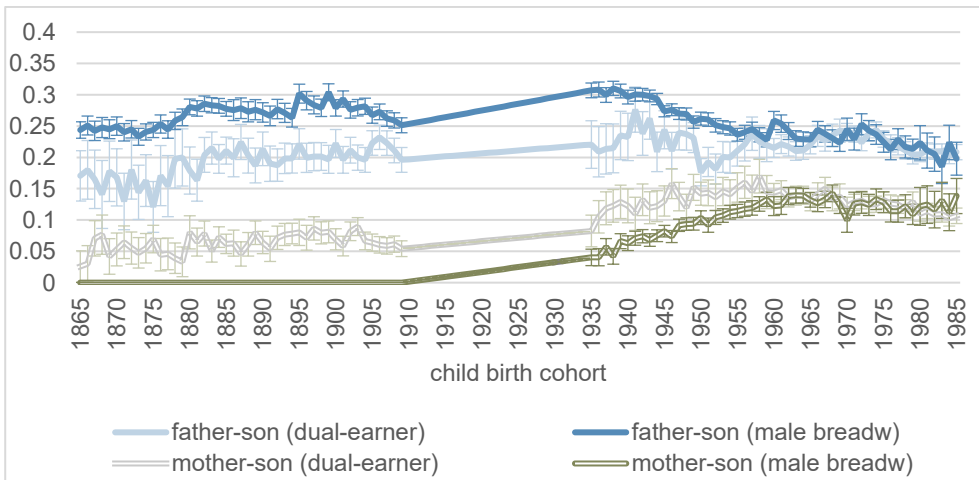


Figure 4b: Parent-son rank-rank associations in occupational status (HISCAM) by parental gender and by family type. Cohorts of children born in Sweden 1865-1985. Based on equation 3 in study design.¹⁰³

¹⁰² For comparison of mobility levels over the long term, see sections on data and study design for varying data limitations.

¹⁰³ For comparison of mobility levels over the long term, see sections on data and study design for varying data limitations.

During most of the period studied, the male breadwinner family is more common than the dual-earner family, and mobility trends in male breadwinner families largely reflect full population mobility trends. Father-child associations are rather constant around 0.25-0.30 in cohorts born before 1935. They decrease over 1935-50 birth cohorts – to 0.25 for sons and 0.15 for daughters, and increasingly diverge between sons and daughters. In the overall population, mother-child associations were stable around 0.05 historically and increased to nearly 0.15 for cohorts born around 1960. Mother-child associations in male breadwinner families – where mothers generally are formally employed only once children are older – are slightly lower than in dual-earner families for cohorts born in the 1930s, -40s and -50s. Among children in male breadwinner families for whom social status is observed in or after 1950 (born from ca. 1890), father-daughter associations are consistently weaker than father-son associations.

In early dual-earner families, father-child associations are substantially weaker than in male breadwinner families; there is a clear ‘breadwinner effect’ in Sweden when the country is a male breadwinner society (as in the US, see e.g. Fischer and Hout 2006). Father-child associations fluctuate between 0.15-0.20 and mother-child associations between 0.05-0.10. These associations taken together sum up to the same levels as father-child associations in male breadwinner families (0.25-0.30). In dual-earner as in male breadwinner families, parent-child associations converge over 1935-50 birth cohorts. By cohorts born in the late 1940s fathers and mothers in dual-earner families impact their children to a similar extent. Mother-daughter and father-daughter associations are equally large, around 0.15 – and remain there for 1950-85 birth cohorts. Mother-son (ca. 0.15) and father-son (ca. 0.20) associations in dual-earner families are more equal for cohorts born around 1950 than they are either for earlier or later cohorts. By the 1970s, the gap between fathers and mothers has widened for sons (fathers almost 0.25, mothers ca. 0.125), while mothers and fathers continue to show the same levels of parent-daughter associations.

As father-child and mother-child associations converge over cohorts born in the 1930s-50s, the gap between dual-earner and male breadwinner families also disappears. The occupational status of breadwinner fathers is no longer more strongly associated with their children’s occupational status than the occupational status of fathers in dual-earner families. Whereas the mother-child association for homemakers was only half that for mothers in dual-earner families among cohorts born in the 1930s-40s, mothers in either family type impact their children’s occupational status equally for cohorts born since 1960. For cohorts born since 1960, the male breadwinner family no longer exists; although there are substantial shares of mothers who do not participate in the labor force at the time their children are young, these mothers show similar parent-child associations in occupational status as mothers who do participate while having young children. In these families, fathers no longer show stronger father-child associations if they are breadwinners

while their children are young. This likely reflects the disappearance of the male breadwinner family type in Sweden during the 1970s; temporary unemployment of mothers no longer reflects homemaker status.

Children born in the 1930s-50s experienced the transition of society from the male breadwinner to the dual-earner family norm either as young adults (early cohorts), or as teenagers or adolescents. In these cohorts, father and mother associations in occupational status did not only converge among male breadwinner families (who themselves changed family type between generations), but also to some extent among dual-earner families. The increasing impact of mothers during this transition is thus not only related to her own changing occupational status, but also to changes at the societal level.

In male breadwinner families, I evaluated the association between mothers' homemaker status and child status attainment (see appendix figure A.2 for exact results). Generally, the category of homemakers is diverse and associated with child status attainment differently for different groups (Beller 2009). Results of this analysis are more revealing about differential selection into male breadwinner and dual-earner families than about the status of homemakers as such. For children (especially daughters) in 1890-1910 birth cohorts – whose own occupations are observed during the heyday of the male breadwinner family (1950 or 1960) – having a homemaker mother is positively associated with child status attainment (as in other contexts, e.g. Kong et al. 2020). The association is however relatively small and unstable; those with homemaker mothers can expect a 0.05 standard deviation increase in occupational status compared to those with working mothers. For cohorts born in the 1930s, having a homemaker mother during childhood is associated negatively with child status attainment. This negative association persists over later cohorts but becomes small for cohorts born after ca. 1945.¹⁰⁴ It likely reflects selection into employment among mothers as society transitions to the dual-earner model, which occurred first among higher-status groups and later among the wider population (see also next section).

The impact of mothers and fathers by social origin

This section covers heterogeneity in the impact of fathers and mothers across the social structure, and changes therein over time. The result of these analyses can be seen in figure 5 for 1865-80, 1935-50, and 1970-80 birth cohorts.¹⁰⁵ The impact of

¹⁰⁴ The employment dummy used no longer reflects 'homemaker status' for most non-working mothers in cohorts born after 1960.

¹⁰⁵ For the sake of readability and conciseness, sons and daughters are grouped together in the results presented here. I performed similar analyses with child gender interactions which showed virtually the same patterns of heterogeneity for sons and daughters (results available upon request).

fathers' and mothers' occupational status can only be evaluated in dual-earner families (subfigure (a)-(c)). Heterogeneity across the social structure of father-child associations in male breadwinner families is also shown (in subfigure (d)). In the historical cohorts, most families are of the male breadwinner type, so I use subfigure (d) to discuss whether the pattern seen for fathers in dual-earner families generalizes to the rest of the population historically.

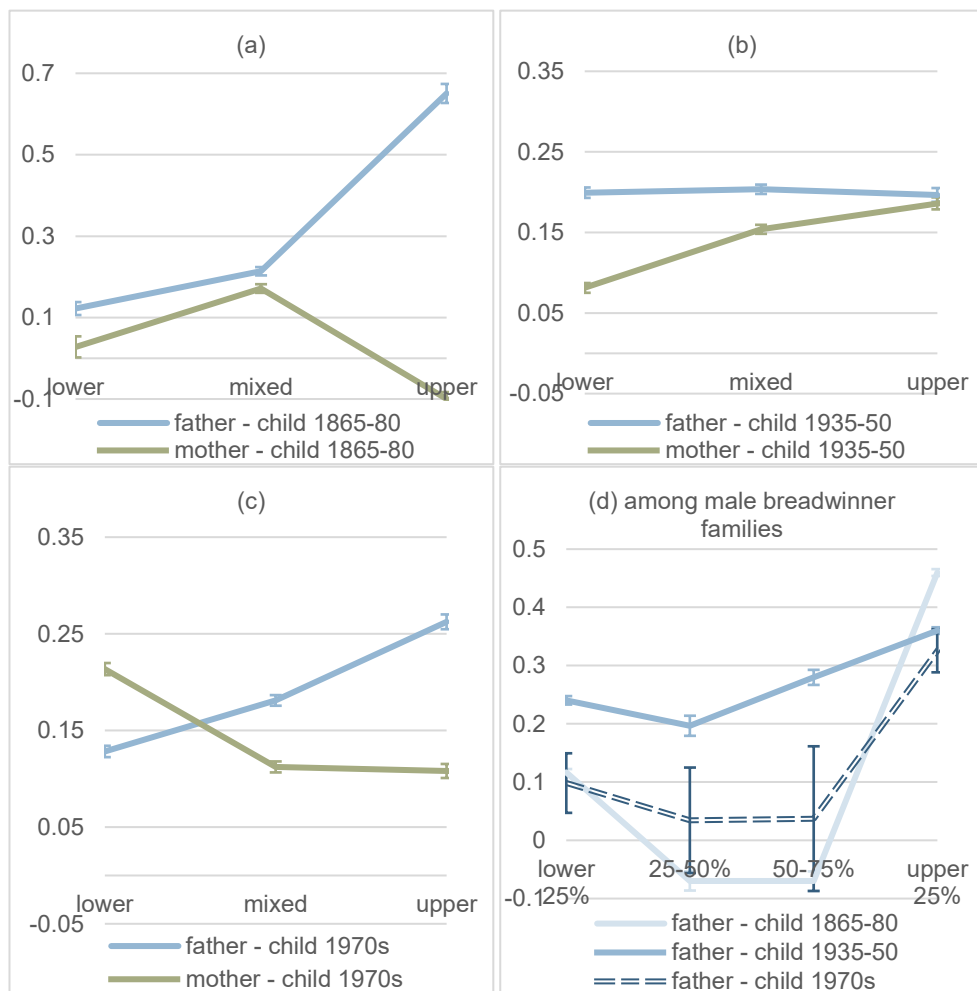


Figure 5: Stratified mobility measures among dual-earners. Parent-child associations by social origin among cohorts born (a) 1865-80, (b) 1935-50 and (c) 1970-80. Social origin split as: “lower” = both parents having an occupational status equal to or below the median, “upper” = both parents having a status above the median, “mixed” = one parent lower + one parent upper. Based on equation 4 in study design. Stratified father-child mobility among male breadwinner families in subfigure (d).

Figure 5 shows major heterogeneity in the parent-child association between children with different social origins. The father-child association is consistently larger at the higher end of the social structure – both among dual-earner and male breadwinner families.¹⁰⁶ This larger impact of fathers at higher social origins is in line with findings on higher persistence of economic resources at the high end of the income or wealth distribution, as discussed earlier. For the cohort born in the 1970s, father-child associations are ca. 0.25 for those with social origins among the upper half, and ca. 0.125 for those with origins among the lower half.

Differences as substantial as I find historically may come as a surprise. In nineteenth-century male breadwinner families (the common family type), I see no – or even a slightly negative – association between fathers' occupational status and child status attainment in the middle of the distribution. The explanation for this is straightforward; almost all of these fathers are farmers, and there is no observed variation in social status to be transmitted to the next generation. However, this does mean that father-child associations among those with higher non-farm origins historically ($> p75$) are very high (almost 0.5) compared to such associations in later cohorts. At the lower end of the distribution ($\leq p25$), where fathers are mostly occupied in broad groups of farm or non-farm laborers, intergenerational associations are also small (0.1).

Dual-earner families among 1935-50 birth cohorts appear to form an exception to the pattern described above, with the father-child association being 0.2 across the distribution.¹⁰⁷ The dual-earner families of the 1935-50 cohorts reflect a specific group, with working mothers with a relatively high own occupational status. In this cohort, the equal impact of fathers across social origins among dual-earners, together with the higher impact of fathers at higher social origins in male breadwinner families, can reflect processes of specialization and household bargaining.

Mother-child associations do not show the same pattern as father-child associations. Mother-child associations in dual-earner society – represented by the 1970s birth cohort – are stronger at the lower end of the social structure (at 0.21), and smaller at the higher end (at 0.11). This means that whether the mother-child or father-child association is stronger depends on the social origin of a child. Given lower parental social origins ($\leq p50$), mother-child associations are larger than father-child

¹⁰⁶ When referring to parent-child associations in this section, I always refer to parent-child associations *conditional* on their social origin being in a certain time span. For example, the 1970s mother-child association of 0.11 in the upper half of the distribution does not reflect the impact on children of having a mother in the upper half of the distribution, but only the impact of her specific status position within this group.

¹⁰⁷ In a similar analysis with more a more detailed stratification, I observe higher father-child associations among families where both mothers and fathers have an occupational status over the 75th percentile.

associations. Given higher parental social origins ($>p50$), the gap between the father-child association (0.26) and mother-child association (0.11) is larger than across the full population.

The pattern observed for children born in the 1970s gradually appears over cohorts born between 1935 and 1980 (interaction models are estimated for all cohorts, but not all shown here). In 1935-50, mother-child associations still show a positive gradient; mother-child associations are equal to father-child associations given higher parental social origin, while mother-child associations given lower parental social origin were very small. Attainment of occupational status above the median reflects a proper career, while most of the mothers with lower occupational status were gainfully employed during short phases of their life only. These differences in labor market attachment could explain why their occupational status is associated differently with child status attainment.

In the 1865-80 birth cohort, mother-child associations are only significant among mixed families; where some mothers belong to the lower and others to the upper half of the social structure. What matters historically in terms of mothers' occupational status is the broad distinction between the lower half, largely composed of domestic servants, and all other occupations performed by mothers.

Accumulation of father and mother social origin

This section covers accumulation effects of social statuses of fathers and mothers, and how such effects change over time. I estimate parent-child associations at a given occupational status range of the other parent (and control for occupational status within this range). Using these conditional associations, at different points in the distribution I can say something about processes of accumulation, and especially whether these are compensatory or multiplicative (cf. Erola and Kilpi-Jakonen 2017).

Figure 6 shows such accumulation of parental social origins in dual-earner families and across the same cohorts as used in the previous section: 1865-80, 1935-50, and 1970-80. Subfigure (a) depicts father-child associations (cf. equation 5 in the study design) conditional on mother's stratified occupational status. Subfigure (b) depicts mother-child associations (cf. equation 6 in the study design) conditional on father's stratified occupational status. The question answered in both figures is: given a higher/lower level of resource A, how much do additional resources B matter?

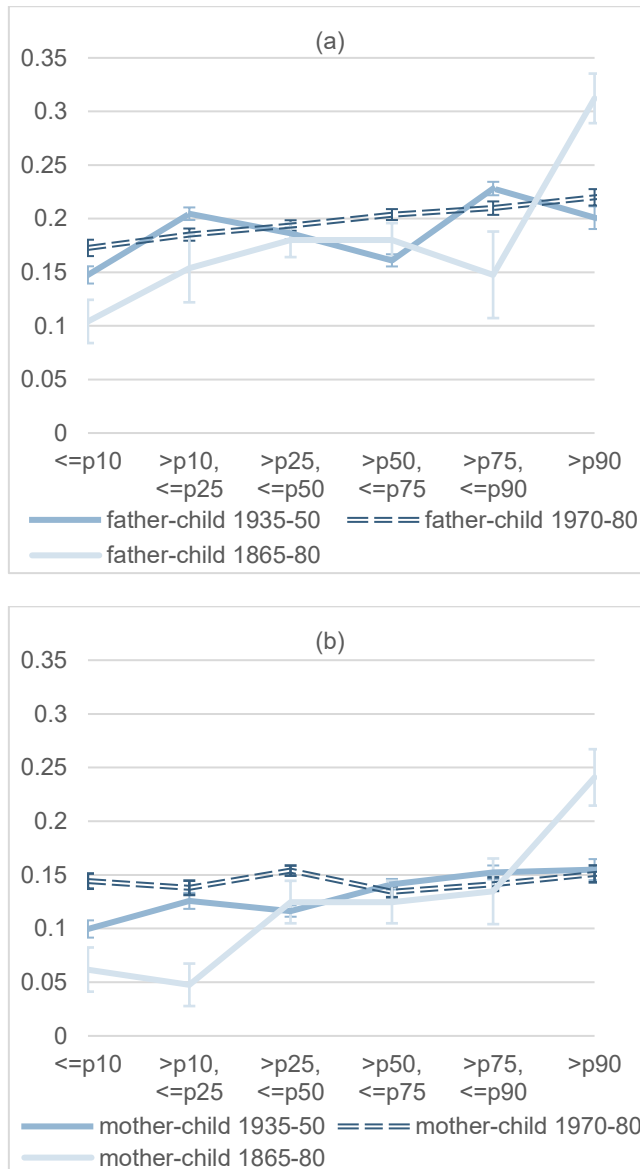


Figure 6: Accumulation of parental social origins. Figure (a): father-child associations stratified by mothers' occupational status and controlled for mothers' occupational status within each strata, based on equation 5 in study design. Figure (b): mother-child associations stratified by fathers' occupational status and controlled for fathers' occupational status within each strata, based on equation 6 in study design. Among cohorts born 1865-80, 1935-50 and 1970-80. Social origin strata split at p10, p25, p50, p75 and p90.

Although there is multiplicative accumulation throughout, differences are not very large in 1935-80 birth cohorts; the net association at the bottom of the first parent's

distribution is ca. 0.05 lower than at the top of the distribution, with conditional associations ranging from 0.10 to 0.23 for different groups. The conditional contribution of mothers is somewhat smaller than that of fathers, but differences are small (mothers ca. 0.05 lower than fathers). In the historical 1865-80 cohorts, I observe the same pattern, but here multiplicative accumulation is more substantial. Conditional associations at the very top (the highest 10 percentile) are particularly high both among mothers and fathers.

In the 1970s birth cohort, accumulation of the mother's status resources over the father's is constant – there is neither multiplicative nor compensatory accumulation. This is perhaps not surprising given the results on heterogeneity by social origin, where mothers overall matter more at the bottom of the distribution in this recent cohort. Given these results, compensatory accumulation could be expected, but net of fathers, the contribution of mothers is equal across the distribution. Together with the results on heterogeneity, this indicates that whether the mother has a broad higher-status position (upper half) is more important than what exact position. In comparison, the exact status position of fathers within the broad higher-/lower-status ranges is of greater importance for child status attainment.

I do not observe compensatory accumulation in the 1935-50 cohort, as expected in specialized households. This can reflect the social gradient in the transition from male breadwinner to dual-earner families, where higher-educated women first participated in the labor force across the life-course and had careers – and therefore held occupations which reflected their social status more than those women who only participated at later ages. This process in combination with positive assortative mating, i.e. higher-educated women also having higher-status partners, could explain the observation of multiplicative accumulation in the 1935-50 cohort.

There are no compensatory 'threshold effects' at very high or low parental status; in this case the additional parent would matter less given the very high/low status of the first parent, as no higher/lower status could be transmitted intergenerationally. Thus, the very high/low status of the first parent does not 'exhaust' the explanatory power of family social origin for child status attainment.

Concluding discussion

My findings combined suggest that both parents need to be included to describe long-term intergenerational mobility patterns and trends. Both parents matter, and they matter differently as institutions of family and work change – as experienced globally over the course of economic development (Goldin 1995). In societies where families form production units or follow a male breadwinner family type, the occupational social status of mothers is well-represented by fathers. In contrast, in families and societies where both mothers and fathers are – at least at some point in their lives – active in the formal labor market, the occupational status of mothers and fathers combined represent family social origin. Approximating family social origin using the occupation of fathers (cf. Long and Ferrie 2013; Song et al. 2020), or one ‘dominant’ parent (cf. Goldthorpe 1983), misrepresents the combined contribution of fathers and mothers differently at different points in time (cf. Beller 2009). This implies that long-term patterns and trends in intergenerational associations between one parent and their children do not reflect long-term patterns and trends in intergenerational mobility of social status among families.

In twenty-first century Sweden, mothers matter equally much as fathers for daughters’ occupational status attainment – and half as much as fathers for sons’ attainment (cf. income, Ahrsjö et al. 2021). Mothers and fathers consistently matter differently for their children’s status attainment. Generally, the occupational status of fathers matters more at higher social origins (as for economic resources, cf. Adermon et al. 2021; Björklund et al. 2012; Hällsten and Thaning 2021). In contrast, the occupational status of mothers matters more at lower social origins. Patterns in occupational mobility thus do not fully mirror those in economic mobility (Ahrsjö et al. 2021; Blanden 2013; Breen et al. 2016; Goldthorpe 2013; Torche 2015). However, of the different dimensions of socioeconomic status, occupational social status is most directly related to the changing institutions of family and work and the family’s changing role in the economy. Therefore, I expect that most of my conclusions about the relative role of mothers and fathers in intergenerational mobility of occupational status under different family types can be generalized to other aspects of transmission of socioeconomic status.¹⁰⁸

In dual-earner families, both historically and today, mother-child associations are stronger than father-child associations given family origins below the median, while the opposite is true among families above the occupational status median. This is not the case in the first phase of the transition from male breadwinner to dual-earner society. High-status mothers were forerunners when mothers increasingly

¹⁰⁸ Because of the long time frame, the measure of social status used in this study is also unusually broad. For example, I approximate variation in educational attainment between mothers who stay at home when having young children – and how this impacts their children – to the extent that this is reflected in mothers’ highest occupational attainment over the life-course.

participated in the labor force; they were the first to participate at all, but also the first to have long-term careers rather than short-term employment after childrearing. It is therefore unsurprising to find that they were the first to impact their children's status attainment; already among 1935-50 birth cohorts, parent-child associations were equally strong between mothers and fathers among higher-status families. At this time, mother-child associations were still marginal among lower-status families.

My results show that – given the social status of one parent and its association with child status attainment – there is a substantial accumulation of status resources from the other parent further contributing to intergenerational immobility. Children benefit particularly from having two parents with high-status origins; given a father with an occupational status in the highest ten percentiles, the mother-child association is still 0.15. I observe highly persistent patterns of multiplicative accumulation over all birth cohorts and across parental gender. Families thus appear to form ‘cooperative’ units where the total is more than the sum of its parts (cf. a large body of empirical and theoretical previous research, e.g. Blau and Duncan 1967; DiPrete and Eirich 2006; Grätz and Wiborg 2020; Merton 1968; Thaning and Hällsten 2020). I had expected children to benefit from specialization in the household under the male breadwinner family type (cf. Becker 1985; Bernardi 2012; Grätz and Wiborg 2020), but do not observe compensatory accumulation of parental resources in any cohort. This may be related to the transition from male breadwinner to dual-earner first occurring among high-status families, and the formalization of women's previously unpaid work.

That the second parent matters in addition to the first parent, and that the second parent matters somewhat differently depending on the occupational status of the first parent, means that using only one parent or the average status of both parents misrepresents the overall contribution of family social origin to some extent. As differences across the social structure are not substantial, the average status of both parents is a reasonable parsimonious measure to use to represent family social origin in dual-earner family contexts (Thaning and Hällsten 2020).

In contrast, especially in ‘production unit’ families – but to some extent also in male breadwinner families – there are no theoretical reasons to expect an independent impact of mothers' occupational status; in patriarchic family production units, the occupation of the head of household reflects the occupational status of all household members, including mothers and children (cf. Goldin 1979). In societies with a male breadwinner ideal that is only partly attainable, having a homemaker mother may be associated with higher child status attainment (cf. Kong, Maas, and van Leeuwen 2020). This is largely confirmed by my analyses; in production unit and male breadwinner families, father-child associations are not overestimated in models excluding mothers, and mother-child associations are rather small. There is a slight positive association between having a homemaker mother and child status attainment in the early days of the male breadwinner family type.

I observe substantial gender differences in father-child and mother-child associations among dual-earner families; same-gender parent-child associations are stronger than opposite gender associations. Daughters and mothers are more likely to hold female-dominated occupations – which are often not ‘dominant’ within the family, while fathers and sons are more likely to hold male-dominated occupations.¹⁰⁹ This results in a worse overestimation of intergenerational mobility among daughters than among sons when the second parent (or mother) is not included in family social origin. This implies that gender differences in intergenerational mobility of social status are not well reflected by intergenerational associations between one parent and children.

Differences in mobility patterns between sons and daughters and between homemaker and dual-earner families may be related to changes in the selection of working women. Homemaker tasks have increasingly become a part of the formal economy (e.g. Stanfors 2007). In the early years of this study, this resulted in high mobility of daughters if daughters of homemaker mothers (without occupational status) were more likely to perform similar work (but with occupational status). In the later years, such intergenerational transmission is captured as intergenerational mobility of occupational status between mothers and daughters, as both performed such tasks within a gender segregated part of the formal workforce.

The change in intergenerational mobility associated with the transition from a male breadwinner to a dual-earner society occurs partly at the family level, and partly at the societal level. As society transitions, mothers become more important – and fathers less important – both among dual-earner families and in the full population. Changes during this transition are less substantial among dual-earner families; in these families, the occupational status of fathers was always less important than it was in male breadwinner families. However, I observe a clear ‘breadwinner effect’ in Sweden when it was a male breadwinner society (as in the US, see Fischer and Hout 2006; Hout 2018). This breadwinner effect disappears as Sweden became a dual-earner society; fathers in both family types mattered equally for their children’s status attainment after the transition.

My results suggest that the transition from male breadwinner to dual-earner society was the most important societal change for overall intergenerational mobility patterns and trends in Sweden over the past hundred-fifty years. Over the fifteen cohorts of children where Sweden went from 30% of mothers ever observed as working to 90% of mothers ever observed as working (1935-50), mother-child rank-rank associations in occupational status increased from low levels (0.05) to levels similar to father-child associations (0.15). The transition not only affected mother-child associations, but father-child associations also dropped substantially from

¹⁰⁹ In our sample, mothers have a lower average occupational status than fathers. This results in the ‘dominant’ parent more often being the father (but see Jarman, Blackburn, and Racko 2012 on gender segregation and women's occupational status).

0.25-0.30 to 0.15-0.25. This increase in mother-child associations, and reduction in father-child associations, are the most substantive time trends observed across 1865-1985 Swedish birth cohorts.

The increase in mother-child associations observed as mothers' labor force participation increases resembles what I observe for the majority population of fathers moving out of agricultural employment during the first half of the twentieth century. Father-child associations in occupational status were negligible among families with agricultural social origins. Once most fathers were employed in other sectors, father-child associations increased substantially across the middle and lower parts of the social structure (to ca. 0.25). This transition in men's work is not reflected in overall intergenerational mobility levels due to a simultaneous opposite trend among higher-status social origins, among whom associations went down from almost 0.5 to ca. 0.3. Homemaker social status thus resembles farming social status; both reflect heterogeneous groups where occupation is not a good indicator of social status (cf. Beller 2009). It seems reasonable to assume that homemakers and farmers, in fact, did have unobserved variability in social status that was not captured by their occupations. This is indicated by variation in wealth, land holdings, or educational attainment among these groups (e.g. Bengtsson et al. 2018; Kalmijn 1994). That parent-child associations overall are at similar levels among cohorts growing up in Sweden in the 2000s as among cohorts growing up in the late 1800s, despite the disappearance of groups with perfect occupational mobility, can then be seen as a sign of long-run increases in social mobility.

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Appendix

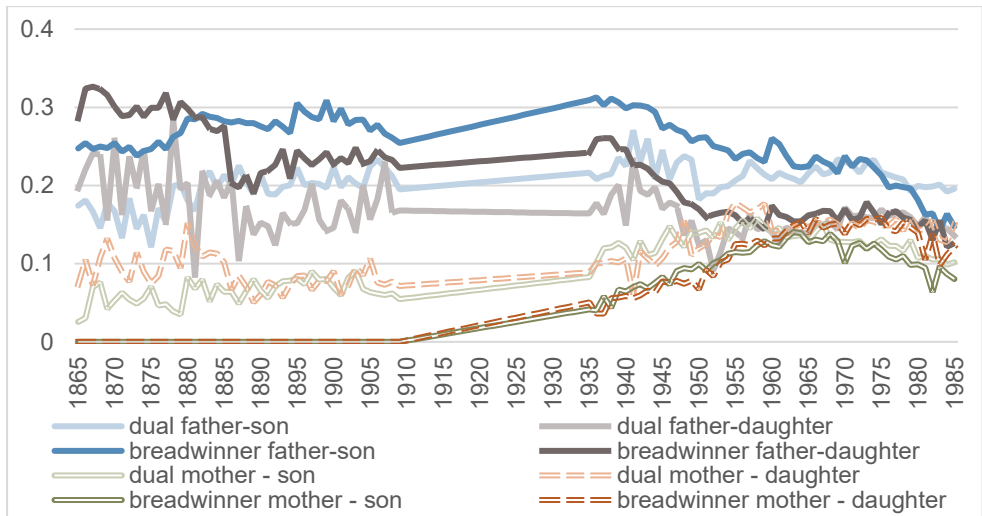


Figure A.1: Parent-child rank-rank associations in occupational status (HISCAM) by parental and child gender and by family type. Cohorts of children born in 1865-1985, and living in Sweden at some point during childhood and adulthood (including foreign-born parents and children). Based on equation 3 in study design.

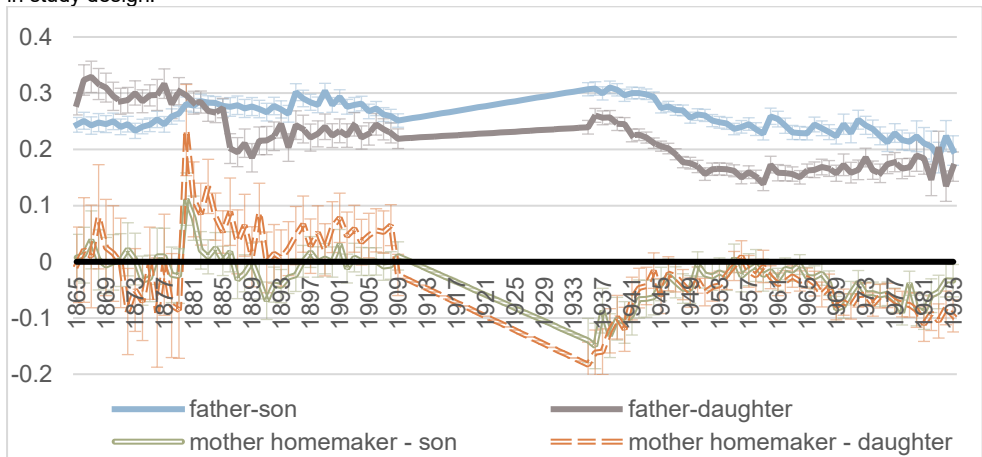


Figure A.2: Father-child rank-rank associations in occupational status (HISCAM), and mother homemaker status (dummy), among male breadwinner families by child gender. Cohorts of children born in Sweden 1865-1985. Model: $Child\ occupational\ status\ (CO) = \beta_0 + \beta_{1-2}G * FO + \beta_3 * G * ME + \beta_4 * G + C\beta + e$.¹¹⁰

¹¹⁰ For comparison of mobility levels over the long term, see sections on data and study design for varying data limitations.

Table A.1: selection process

(a) Observations by cohort	1865-1880	1880-1895	1895-1910	1935-1950	1950-1960	1960-1970	1970-1980
Men	727,493	906,884	864,960	790,069	562,001	615,764	586,527
Women	711,902	881,332	834,764	761,490	531,495	583,918	557,156
N	1,439,397	1,788,343	1,699,724	1,551,559	1,093,496	1,199,682	1,143,683
(b) Subsample with sufficient links across time for both individuals and parents, as share of the above							
Men	48.71	42.75	56.86	89.11	87.67	80.68	84.04
Women	47.90	42.34	60.75	87.30	87.77	79.62	82.52
(c) Subsample with own observed occupation, as share of the above							
Men	85.59	95.58	97.64	98.38	96.95	96.04	94.79
Women	27.89	36.85	35.79	96.49	97.10	96.31	95.15

Table A.2: summary statistics, among the analytical sample of working sons and daughters

sons	1865-1880	1880-1895	1895-1910	1935-1950	1950-1960	1960-1970	1970-1980							
	mean/% sd	mean/% sd	mean/% sd	mean/% sd	mean/% sd	mean/% sd	mean/% sd							
HISCAM	53.67	9.02	55.60	10.78	57.44	12.00	71.80	15.10	71.56	15.09	71.02	14.71	70.05	14.66
HISCAM	1908.08	4.26	1940.28	17.57	1955.00	7.39	1992.75	14.52	2001.67	13.12	2008.37	9.73	2012.77	3.98
Age father at birth	35.10	7.26	34.93	7.83	34.59	7.77	32.87	7.04	31.76	6.96	30.13	6.77	29.60	5.66
Age mother at birth	32.03	6.48	31.64	6.50	31.34	6.63	29.20	6.08	28.34	6.10	26.90	5.84	26.83	4.93
Father HISCAM	52.48	7.91	53.21	8.19	53.46	8.20	62.05	14.25	66.03	15.09	68.86	15.03	70.96	15.11
Mother HISCAM	51.33	3.84	47.75	4.70	40.89	4.27	58.30	8.90	61.84	13.13	66.67	15.26	69.85	15.51
Empl. father (ever)	0.98	1.00	1.00	1.00	1.00	0.97	0.97	1.00	1.00	1.00	1.00	1.00	0.98	
Empl. mother (ever)	0.10	0.20	0.20	0.26	0.26	0.52	0.52	0.92	0.92	0.96	0.96	0.97	0.97	
Empl. father (child)	0.95	0.94	0.94	0.99	0.99	0.94	0.94	0.94	0.94	0.92	0.92	0.89	0.89	
Empl. mother (child)	0.00	0.01	0.01	0.01	0.01	0.10	0.10	0.18	0.18	0.42	0.42	0.59	0.59	
Observations	279,500	344,993	440,112	638,328	463,716	458,210	426,778							

Table A.2 (cont.)

daughters	1865-1880	1880-1895	1895-1910	1935-1950	1950-1960	1960-1970	1970-1980
	mean/% sd	mean/% sd	mean/% sd	mean/% sd	mean/% sd	mean/% sd	mean/% sd
HISCAM	50.81	55.82	56.95	72.19	72.97	72.37	71.41
	11.03	11.13	11.07	16.00	15.90	15.06	15.16
HISCAM year	1905.99	1938.61	1954.36	1994.34	2001.21	2007.70	2012.79
	5.69	18.09	7.33	13.98	12.88	10.17	4.03
Age father at birth	35.67	35.39	34.80	32.88	31.75	30.15	29.66
	7.35	7.86	7.79	7.06	6.98	6.81	5.70
Age mother at birth	32.46	31.99	31.51	29.22	28.32	26.90	26.88
	6.46	6.46	6.58	6.12	6.12	5.87	4.97
Father HISCAM	52.87	54.21	54.43	62.01	65.96	68.72	71.04
	8.52	9.39	9.33	14.19	15.03	15.00	15.14
Mother HISCAM	51.44	48.05	41.17	58.30	61.86	66.62	69.93
	4.41	5.40	4.94	8.94	13.15	15.28	15.59
Empl. father (ever)	0.98	1.00	1.00	0.97	1.00	1.00	0.98
Empl. mother (ever)	0.11	0.21	0.27	0.53	0.92	0.96	0.97
Empl. father (child)	0.95	0.94	0.99	0.94	0.94	0.92	0.89
Empl. mother (child)	0.00	0.02	0.01	0.11	0.18	0.42	0.59
Observations	84,830	126,305	165,311	593,406	440,222	429,591	399,714

Paper IV



Intergenerational Status Persistence in Sweden 1865-2015. The Impact of Occupational and Surname Status¹¹¹

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Abstract: This paper contributes to the literature on long-term changes in intergenerational mobility. Social origin is measured comprehensively both as occupational and surname-based social status – both from mothers and fathers. The paper aims to link an expanding literature on surname status persistence to the conventional field of intergenerational mobility research studying parent-child associations in socioeconomic status by interpreting surname group belonging as a heritable status dimension at the group-level (such as ethnicity). Intergenerational occupational mobility is surprisingly stable in Sweden over the past hundred-fifty years, with rank-rank correlations around 0.27 – as in the US (Song et al. 2020). Pre-industrial surname status forms an important dimension of intergenerational immobility among high-status groups and for high status attainment. Long-run mobility trends differ by surname status. Among low-status surname groups, mobility decreases substantially once the transition away from agriculture is completed. Mobility instead increases among high-status surname groups, where intergenerational correlations were high (0.45) in nineteenth-century Sweden. Most pre-industrial surname groups converged in their mobility levels at the time when comprehensive schooling was introduced, making inequality in educational opportunity a likely cause of surname status inequality. In the twenty-first century, mobility patterns continue to differ between those with and without a Swedish surname background, and those with elite pre-industrial surnames and the rest.

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Introduction

This paper aims to demonstrate long-term trends in intergenerational persistence as reflected by an individual's chances to move up or down the social ladder as compared to their parents. A comprehensive approach to measuring intergenerational persistence is applied by including both occupational and surname status, as components of social origin (cf. the "equality of opportunity" approach in Björklund and Jäntti 2020). This approach aims to link an expanding literature on surname status persistence (e.g. Clark 2014; Dalman, Eriksson, and Dribe 2022; Güell, Pellizzari, et al. 2018; Güell, Rodríguez Mora, and Solon 2018; Santavirta and Stuhler 2022) to the conventional field of intergenerational mobility research studying parent-child associations in social class, occupational status or other socioeconomic status indicators. These two approaches have been considered at odds with one another, and the surname approach has been criticized on several grounds (e.g. Torche and Corvalan 2018). Most importantly, surname *groups*, as used by economic historian Gregory Clark (e.g. Clark 2014; Clark et al. 2015) and in this study, capture group-level intergenerational persistence rather than parent-child associations (Güell, Rodríguez Mora, et al. 2018a; Torche and Corvalan 2018).

I study to what extent such group-level intergenerational persistence reflects, and interacts with, individual-level status transmission by incorporating surname groups in a more conventional parent-child model of intergenerational status transmission. Different combinations of group-level processes of intergenerational persistence and individual-level intergenerational mobility have different implications for equality of opportunity at the societal level (Güell, Rodríguez Mora, et al. 2018a). Therefore, the approach taken in this paper leads to a better understanding of equality of opportunity at the societal level, and specifically on what long-term mobility processes at the societal level are reflected by short-term parent-child associations in occupational status.

The paper contributes to the literature on long-term changes in intergenerational persistence and equality of opportunity. To what extent are parental occupational or surname status associated with child status attainment at the individual level? Swedish surname groups are used as a proxy for pre-industrial status groups, as distinct surname types are associated with these pre-modern Weberian status groups (see below for details). Parental occupational status reflects social distinctions with a more direct economic connotation. Status attainment in the child generation is measured in the same way as parental occupational status, so that I can study intergenerational status correlations. I ask to what extent parental occupational and surname status are each associated with child status attainment. I further study the effect of parental occupational status within surname status groups, and the premia associated with surname status groups net of parental occupational status. This allows for the quantification of the complementarity and overlap between these

different dimensions of social origin. Surname groups used here reflect pre-industrial forms of social distinction. I study changes over time to answer the question whether surname status persistence is a pre-industrial phenomenon only or persists in modern times. And I study heterogeneity by social status to clarify whether surname status persistence is an elite phenomenon, limited to pre-industrial elites and high-status groups. Importantly, I distinguish long-term trends in intergenerational mobility by surname status.¹¹² This results in different intergenerational mobility trends over the past hundred-fifty years in Sweden for different societal groups. Parental occupational and surname status are both operationalized by including information on mothers as well as fathers. An expanding literature shows the impact of mothers to matter greatly, both in recent cohorts and when evaluating changes in intergenerational mobility over time (e.g. Beller 2009; Thaning and Hällsten 2020). In my other work I show that mothers' occupational status matters differently depending on the prevailing family type in society (Dalman 2022b).

The above questions are answered using individual parent-child pairs covering most Swedish children born 1865-1985 and their parents as observed in historical and modern full-count population censuses and register data covering the period 1880-2016 (10.47 million children and their parents). This extensive source material covering most of the Swedish population across Sweden's industrial and welfare transformation makes it possible to separately study the nature of intergenerational mobility among elite, high-status, majority, and disadvantaged social strata. The paper proceeds as follows: a background section which introduces theory, context, and previous research, subsequently data and methods sections, followed by results, and finally a concluding discussion.

¹¹² For readability in the remainder of the paper "intergenerational mobility" is used to refer to intergenerational *occupational* mobility in most instances.

Background

Structural transformations and institutions for equal opportunities

Sweden industrialized relatively late in a European context, with industrialization not fully taking off until the 1890s (e.g. Schön 2012). In a few decades, Sweden transitioned from an agricultural to an industrial economy. At the same time primary education expanded (Ljungberg and Nilsson 2009), transport and communication improved and the country urbanized. However, education of the broader elites (at *läroverk*) and the rest of the population (at *folkskola*) was largely separated, with some exceptions. From the 1930s onward, the Swedish welfare state emerged and expanded, and Sweden experienced a long episode of mostly social-democratic governments expanding the welfare state until the 1990s. Basic education made a leap forward among cohorts born in the late 1940s and 1950s, which were the first to attend comprehensive primary and secondary schooling (*grundskola*). Tertiary education expanded among subsequent birth cohorts.

A well-known claim of modernization theory is that these processes of modernization entailed a transition from ‘ascribed’ to ‘achieved’ status attainment; attainment would depend less on your parents’ social standing, and more on your own effort and ability. During modernization, social origin would become less important while individual achievement in terms of educational and occupational performance became more important for further status attainment (Treiman 1970). While the popularity of modernization theory has passed its peak, empirical evaluations have confirmed a decreasing impact of fathers’ social class on their sons’ social class during (early) industrialization (e.g. Maas & Van Leeuwen 2016; Dribe, Helgertz & van de Putte 2015). This process occurred under the influence of both structural changes, where industrialization placed increasing demands on the skill levels of workers, and changing value systems which entailed newly arising ideals of equal opportunity and everyone’s right to pursue their dreams and materialize their talents. In this study, I am able to describe to what extent levels and patterns of intergenerational mobility in occupational status changed during the later phase of industrialization and with the introduction of institutions for equal opportunities.

Social status in a changing social structure

Occupational class increasingly defines social stratification as formal employment expands; the occupational structure becomes more diverse and formal labor relations more complex. In pre- or early-industrial societies where families often form a production unit with informal labor relations rather than individual ‘occupations’ – such as Sweden until the late nineteenth century – social

stratification by class is largely limited to the owner/worker dichotomy. Weberian ‘status’, estate or prestige (in Swedish: *stånd*, German: *Stände*) in the form of ascribed group belonging was the predominant mode of *social* stratification in most pre-industrial European societies (cf. Weber 1991 [1922]).¹¹³ Weberian ‘class’ refers to economic relationships, in particular ownership and level of skill (Weber 1991 [1922]). In pre-industrial societies, observable differences in skill level are small among the majority population working in the primary sector, and ownership of more than a family production unit is concentrated to a small elite. The relevance of occupation-based ‘class’ as a description of social stratification across broad shares of the population is therefore tied to the expansion of a formal labor market during industrialization (see also contemporary accounts, e.g. Fahlbeck 1892).

In a comparison of surname and occupation-based social status, Max Weber’s concept of ‘status’ is more relevant than ‘class’ (Weber 1991 [1922]). ‘Status’ in Weber (*stände*, *stånd*) is defined with pre-industrial status groupings (in English often called “estates”) in mind – although the concept can be applied much more broadly (e.g. to ethnic, racial or gender groups). Status groups form communities and status refers to social prestige, ascribed group belonging with shared customs, conventions and values and strong social ties (see also Gane 2005):

In contrast to classes, status groups are normally communities. [...] We wish to designate as ‘status situation’ every typical component of the life fate of men that is determined by a specific, positive or negative, social estimation of honor. (cont.)

Weber explicitly addresses the relationship between the class concept, which is primarily economical and based on property, and the status concept, which is primarily social:

Property as such is not always recognized as a status qualification, but in the long run it is, and with extraordinary regularity. (cont.)

Thus, class is – at least in theory – less persistent than status. Status situation reflects – among other things – the long-run (expectation of) property associated with a certain community, while class reflects current property. Concretely, status groups are distinguished by “a specific *style of life*”:

Linked with this expectation are restrictions on ‘social’ intercourse. [...] These restrictions may confine normal marriages to within the status circle. (Weber 1991 [1922], p. 185-86)

¹¹³ Within status groups as well as within numerous occupations (e.g. workers, farmers, proprietors, civil servants), important *economic* stratification existed. Such economic stratification goes beyond the scope of this paper, but presumably economic differences within social strata were also important for life outcomes (labor market outcomes, marriage market outcomes, etc.).

In Sweden, government was organized along estate lines until 1866, and power continued to be formally concentrated among elites until 1919 when universal suffrage was introduced (Bengtsson 2019). These estates thus formed high-status groups in Swedish society based on their distinct prestige in this domain (e.g. Norrby 2005). Another high-status group before industrialization were those who attended higher education. Both these political and cultural high-status groups often had high-class belonging, but their status was not defined by their class belonging and could be retained even in the absence of property.

Their identification as nobility, clergy, bourgeoisie and other persons of status (*ståndpersoner*), farmers or 'estateless', was of great consequence for inhabitants of Sweden. Outside of the (broader) elite, a clear urban-rural division was apparent between the farming and the (petty) bourgeoisie. Status distinction was not limited to the distinction of four estates but included legal, customary and economic forms of distinction (e.g. Edgren 2021). Estate belonging was an ascribed (heritable) trait, represented by distinct types of surnames. An 'ascribed' trait such as belonging to these status groups is less dependent on participation in a formal labor market and more dependent on place of birth. Therefore this ascribed status of both mothers and fathers should be expected to form an important dimension of the intergenerational transmission of social inequalities in ascription societies. Through intergenerational transmission and status exchange on the marriage market, status inequalities of fathers and mothers both within (occupations) and outside of (surnames) the formal labor markets may have remained important for child outcomes even for generations born after this pre-industrial system of social stratification was formally abolished (as indicated for descendants of the nobility in e.g. Almenberg and Dreber 2009).

Is social stratification by heritable attributes (such as surname group belonging) or attained attributes (such as occupation) more consequential in a given context, and how are such attributes defined for different members of a family? Historically, both sexes were born and often married within a status group, with occupational choice largely limited to typical occupations for that status group (Weber 1991 [1922]). This was the case in Sweden as in many other European societies (e.g. Fahlbeck 1892). Industrialization gave increasing shares of fathers more occupational opportunities in the first half of the twentieth century, and changing gender norms gave increasing shares of mothers occupational opportunities in the second half of the twentieth century (Stanfors and Goldscheider 2017). This resulted in social stratification by occupation increasing both quantitatively and becoming formally independent of historical status groupings. In patriarchic nuclear families, occupational social status was defined by the occupation of the head of household, while in dual earner families, both parents each have a distinct occupation-based social status (e.g. Beller 2009; Dalman 2022; Thaning and Hällsten 2020).

Swedish surname practices and surname groups

The previously described historical status of families in Sweden can be derived from their surname group belonging, as different pre-industrial status groups had distinct surname practices (e.g. Dalman et al. 2022; Nyström 2021). Here I distinguish ten surname groups but combine them into five broader groups. Elite surname groups (titled and untitled nobility names as formally recorded and protected by *Riddarhuset*, and ‘latinized’ names, e.g. *Hammar skjöld*, *Linnaeus*) reflect a pre-industrial origin among ruling estates – either religious or military. High-status surname groups (Greek-sounding, French-sounding and any other special names historically, e.g. *Nobel*, *Bonnier*) were used by nineteenth-century persons of status not belonging to the ruling elites. Those with high-status surnames would usually have attended higher education, and work in higher-status occupations such as teachers, civil servants, commerce, etc. The group consists both of families who were upwardly mobile in the nineteenth century, and families with a longer high-status heritage.

I further separate urban or (petty) bourgeoisie (‘middle-status’) surnames from rural or farming (‘lower-status’) surnames. These ‘middle-status’ surnames are represented by nature-oriented or geographical surnames (e.g. *Strindberg*, *Bergman*). ‘Lower-status’ surnames are composed of two groups: patronymic surnames (e.g. *Andersson*, *Eriksdotter*) mostly used by the working class and those with agricultural origins, and soldier names (e.g. *Stark*). See other work by me and co-authors (Dalman et al. 2022) for a more extensive discussion of Swedish surname groups.

In Sweden, maiden names were commonly used even by married women; there existed no legislation regulating the transition from “maiden name” to their husband’s name upon marriage until 1921 (*Giftermålsbalken*, Widerberg 1980). In pre-modern Sweden, women with high-status surnames, such as noble surnames, generally continued to bear their maiden surname after marriage – signaling their connecting role between two lineages (e.g. Ohlander 2002). In the census material used here I thus observe both mothers’ and fathers’ surname group belonging.¹¹⁴

Changes over time in the distribution of children over these surname groups, and without observed surname groups, are shown in figure 1.¹¹⁵ Figure 1 shows that the

¹¹⁴ Only in the 1950 census are mothers recorded with both their married and maiden name, but I am able to extract maiden names even here.

¹¹⁵ For 1935-1985 birth cohorts I observe ancestor surnames in 1950 rather than individual surnames. Individuals are assigned to the same surname group as their paternal grandfather, father, or themselves depending on which is the latest generation observed in 1950. Those born after 1950 with no registered father are assumed to belong to the same surname group as their mothers. This means that I only observe intergenerational transmission of ancestral surname status and not effects of surname connotation after 1950. By assigning surname groups through intergenerational links rather than observed names I avoid any biases in surname status

share of the population with high- or elite status surnames gradually increases over 1865-1950 birth cohorts, as adoption of such surnames was common in this period. For 1935-1980 birth cohorts the share bearing high-status surnames is stable, as I observe ancestral surnames in 1950 rather than actual surnames (see also Dalman et al. 2022). The share of children bearing – or having ancestors with – lower-status surnames is continuously declining across cohorts. For cohorts born since 1935, this is related to the increase in the share of children with no observed ancestor surname; mainly consisting of immigrants or (grand)children of immigrants.

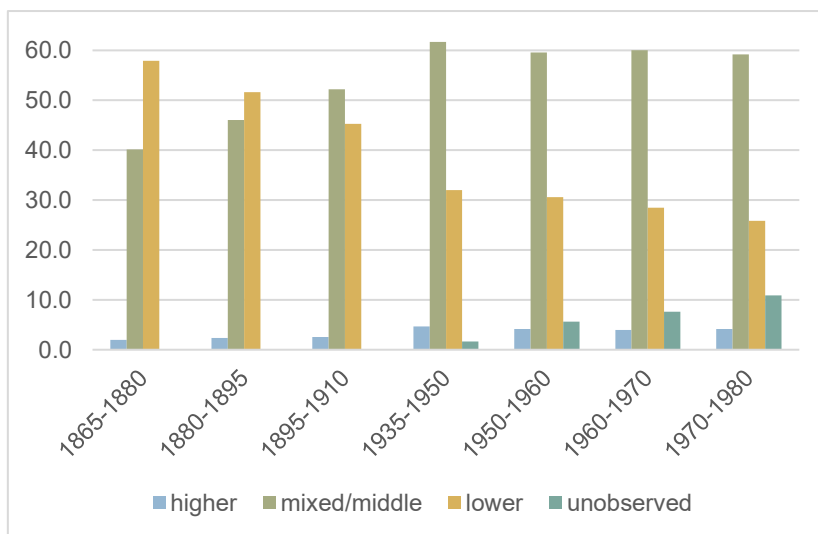


Figure 1 Share of children with given surname type - as divided over broad “higher” status, “middle/mixed”, “lower” status, and “unobserved” surname types. “Higher” status includes children with one higher or elite surname and no lower status surname (nobility/latinized + nobility/latinized/high/middle/unobserved or both high, with high being Greek-sounding or French-sounding); “lower” status includes children with two parents with mainly patronymic, or patronymic + unobserved, surname status; “unobserved” includes children where no parental surname group is observed (i.e. first- and higher generation immigrants), and “middle/mixed” includes children with any other parental surname combination (e.g. geographic, lower + higher status, etc.).

In figure 2, the average occupational status of (a) children, (b) their fathers, and (c) their mothers is shown for different child birth cohorts and by broad surname group belonging. The average occupational status is given separately for families with higher-status surnames, for families with middle-status or mixed surname heritage, families with lower-status surnames, and those with no observed surname heritage

persistence caused by changing of surnames by more mobile individuals for 1935-80 birth cohorts.

(see the subsequent methods section for the definition of occupational status). Figure 2 shows that children experienced occupational upgrading especially in the historical period (1865-1935 birth cohorts). The occupational status of 1935-1980 birth cohorts is rather constant or slightly decreasing.¹¹⁶ Among parents to 1865-1910 birth cohorts, average occupational status was relatively stable at low levels while status increased substantially for parents to 1935-80 birth cohorts. Average occupational status differences between surname groups clearly exist throughout the period studied. They decrease over time among fathers and children, while they increase for mothers.

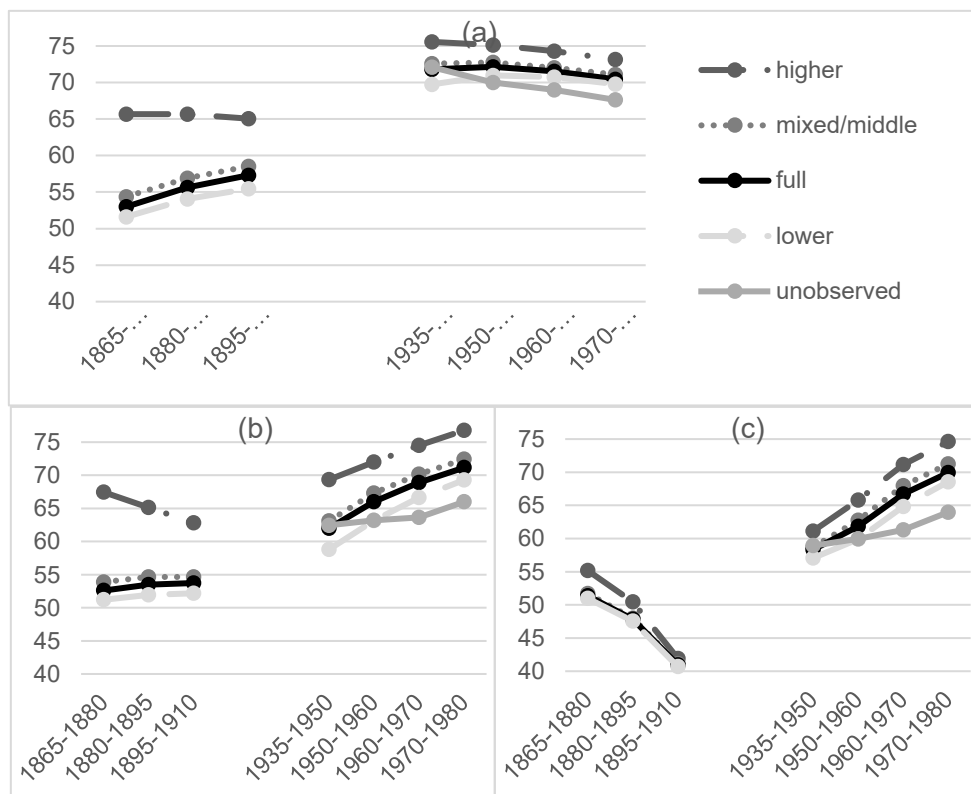


Figure 2 Mean occupational status (HISCAM value) among children and parents by surname group. All (a) children, (b) fathers, and (c) mothers to each birth cohort (“full”) and the average HISCAM status within broad parental surname combinations. Parental surnames are divided over “higher” status, “middle/mixed”, “lower” and “unobserved” surname types, as in figure 1.

¹¹⁶ This is most likely related to occupational maturity; later cohorts are observed at younger ages, so that career progress towards the end of occupational careers is not captured for later cohorts. This is clearly reflected in intergenerational occupational correlations, see figure 4.

Different stories on intergenerational persistence over the long run

This study connects to the literature on intergenerational transmission of socioeconomic status over the very long term. The first cohorts studied are born in the 1860s, and their parents enter the labor market and reach occupational maturity before Sweden industrializes to a substantial degree. The children in this cohort reach occupational maturity when industrialization has taken off in full, after 1900. Thus, I do not observe parent-child pairs before industrialization, but parents before and children during industrialization. Intergenerational mobility is generally found to be higher in the middle of the industrialization process than among later cohorts (as e.g. in Berger et al. 2021; Long and Ferrie 2013; Song et al. 2020). Studies on social mobility going yet further back in economic development find lower levels of social mobility before industrialization than during or after industrialization (e.g. Dribe, Helgertz, and Van de Putte 2015; Maas and Van Leeuwen 2016; Modalsli 2017).

One of the approaches taken to study intergenerational mobility over the long term has been the use of surnames and surname groups to proxy family lineages (e.g. Clark 2014; Güell, Rodríguez Mora, and Telmer 2015). According to Gregory Clark and collaborators, at the surname (group) level, random variation in any one indicator of socioeconomic status would be lower than at the individual level because of the larger sample size. Therefore, parent-child associations in “underlying” socioeconomic status can be approximated better at this level than at the parent-child level (cf. Bukowski et al. 2021; Clark 2014; Clark et al. 2015; Clark, Leigh, and Pottenger 2020; Clark and Cummins 2014, 2015). Alternatively, surnames can be used to study intergenerational persistence using cross-sectional or other data sources not suited for following families over time. Not because they form a better measure than parent-child associations, but because they form a measure on equal footing that can be applied more easily to a wider range of contexts (Barone and Mocetti 2021; Güell, Pellizzari, et al. 2018; Güell, Rodríguez Mora, and Telmer 2007; Güell et al. 2015; Santavirta and Stuhler 2021). This latter approach is also applied to study intergenerational persistence using first names (Olivetti and Paserman 2015; Olivetti, Paserman, and Salisbury 2018; Santavirta and Stuhler 2021), and in other evaluations of the surname approach (Chetty et al. 2014; Feigenbaum 2018).

Both approaches find high intergenerational persistence of socioeconomic status. Higher than implied by the intergenerational mobility literature, if intergenerational mobility would be a simple parent-child transmission process (“AR(1)”, cf. Becker and Tomes 1986). Thereby they confirm a finding also common in the expanding ‘equality of opportunity’ literature; intergenerational persistence of (dis)advantages is higher than implied by levels of parent-child class or income mobility. When conceptualizing socioeconomic status more broadly than the earlier

intergenerational mobility literature did, complementary intergenerational transmission processes result in the observation of higher overall persistence.

However, both surname approaches lean heavily on the ‘informational content’ of lineages contained in rare, often high-status, surnames (Santavirta and Stuhler 2021). That is, rare surnames with a social status differing from the population average provide more information about social standing than other surname types. Thus, resulting estimates of intergenerational persistence may reflect high-status groups in society more than other social strata (see also e.g. Maas 2015). Indeed, when evaluated empirically, intergenerational persistence as measured using surnames appears to be higher among higher-status groups, both at the surname and surname group level (Barone and Mocetti 2021; Dalman et al. 2022; Santavirta and Stuhler 2021).

In the current study I apply a group-level surname approach similar to Clark’s (Clark 2014). In other work, my co-authors and I have found that much of the informational content of individual surnames in Sweden is contained in a small number of surname groups distinguished by their distinct historical status groups (Dalman et al. 2022). Thus, the big difference between this paper and earlier work on surname status persistence is that I use surname groups rather as a proxy for such historical status origins than as a proxy for individual lineages. This distinction is important, especially in the context of another major critique to the surname status persistence literature. When using surnames, intergenerational mobility is estimated using grouped data. This means that surname-level or surname group-level intergenerational transmission only reflects the between-group component of parent-child intergenerational transmission (cf. Torche and Corvalan 2018). Within surname groups, intergenerational transmission of socioeconomic status may be either high or low. Depending on this, high surname-level intergenerational persistence has different implications for an individual’s chances to move up or down the social ladder as compared to their parents.

Therefore, in this study I combine the group-level surname approach with individual-level parent-child associations in socioeconomic status. In other work, my co-authors and I found very high intergenerational persistence in Sweden at the surname group level, across all social strata (Dalman et al. 2022). However, some of the large surname groups contain 25-65% of the Swedish population. For such large groups, intergenerational mobility *within* surname groups is of great importance for child status attainment, as members of these surname groups are distributed across all social strata to a much larger extent than the members of small high-status surname groups. High surname-level intergenerational persistence could potentially go hand in hand with substantial individual-level mobility within large surname groups. For small surname groups, high surname-level persistence limits the possible levels of overall mobility more.

Combining the study of individual-level and group-level processes of intergenerational persistence has been suggested as a new and valuable direction of mobility research (Güell, Rodríguez Mora, and Solon 2018b). A similar approach has been applied in the context of geographical or neighborhood differences in intergenerational mobility (Chetty et al. 2014; Chetty and Hendren 2018a, 2018b; Connor and Storper 2020), and racial or ethnic differences in intergenerational mobility (Chetty et al. 2020; Davis and Mazumder 2018; Torche and Corvalan 2018). However, within-group and between-group mobility processes have so far not been disentangled when it comes to surname groups.

These surname groups reflect status origins forming important markers of distinction historically. My combination of surname-level and individual-level intergenerational occupational mobility therefore makes a valuable contribution to the broader literature on equality of opportunity by addressing the following: Are life chances still different for cohorts born in Sweden in 1865-1985 based on historical status origins? For an individual's chances to attain different status positions from their parents – given their inherited surname, it matters greatly whether they are expected to be highly mobile within but not between surname groups, or rather mobile both within and between surname groups. These two alternatives differ in their consequences at least as long as the social structure of different surname groups has not converged to be equal (see for a formal discussion Güell, Rodríguez Mora, et al. 2018b). In the case of the Swedish pre-industrial status groups distinguished through surnames such complete convergence is not reached until at least 2015, although surname status inequality is substantially smaller in 2015 than in 1880 (see Dalman et al. 2022).

What kind of mobility?

Another important distinction between earlier studies on long-term mobility trends lies in what type of intergenerational transmission of socioeconomic status each of them examines. Long-term trends in social class mobility (e.g. Maas and Van Leeuwen 2016) may not be the same as trends in intergenerational rank-rank correlations also used here (e.g. Song et al. 2020). Studies on intergenerational mobility, intergenerational effects, sibling correlations, and equality of opportunity do not capture the same processes of intergenerational transmission (Björklund and Jäntti 2020; Stuhler 2018). In this paper, I follow the currently expanding “equality of opportunity” approach and study intergenerational transmission of multiple components of socioeconomic status (cf. Björklund and Jäntti 2020).

In this branch of the literature, previous simpler models of intergenerational transmission have been criticized. Multiple rather than a single generation of ancestors affect child status attainment, either directly or indirectly (e.g. Adermon, Lindahl, and Palme 2021; Hällsten and Kolk 2020; Lindahl et al. 2014; Solon 2018;

Song and Mare 2017). Moreover, different indicators of socioeconomic status complement and interact with one another, so that intergenerational transmission of overall (dis)advantage is substantially higher than transmission of one specific aspect of socioeconomic status (e.g. Adermon et al. 2021; Engzell and Tropf 2019; Hällsten 2013; Mood 2017; Vosters 2018; Vosters and Nybom 2017).

Findings diverge between studies of inequality of opportunity (all intergenerational transmission of socioeconomic status) and studies of intergenerational mobility (one indicator of socioeconomic status). However, either approach can be relevant to answer different research questions and therefore these differences do not imply that one or the other is incorrect or suffers from measurement error. In the current paper I take a broader approach than traditional intergenerational mobility studies by including both surname and occupational status, and study how both aspects of social origin affect child status attainment. This approach facilitates the study of intergenerational persistence of (dis)advantages in a broad sense. I am not only able to describe overall mobility levels over time, but also to disentangle distinct mobility patterns across the distribution of surname-based social status.

One reason to look beyond summary metrics of intergenerational class or income mobility is heterogeneity in intergenerational transmission across the distribution of socioeconomic status. The level of intergenerational persistence experienced by individuals depends on their parents' position in the social structure. A number of previous studies, both on Sweden and other countries, have found intergenerational persistence of socioeconomic status to be higher at the high end of the social structure (Adermon et al. 2021; Björklund, Roine, and Waldenström 2012; Reeves et al. 2017). Social climbers often experience worse (economic) outcomes even within high-status positions (e.g. social class and wages, Hällsten 2013; Laurison and Friedman 2016), and intergenerational transmission of physical resources such as wealth is particularly strong among high-status groups (e.g. Hällsten and Pfeffer 2017; Pfeffer and Killewald 2018). Social networks, manners and habits, and other forms of distinction could also play a role in strong high-status persistence (e.g. Almenberg and Dreber 2009; Reeves et al. 2017). This study contributes to the literature on such heterogeneity by studying intergenerational transmission of occupational status within different historical status groups. As surname groups reflect different parts of the social structure historically they can be used to describe how mobility patterns differ across the social structure.

Data

In this study, historical and contemporary full-count censuses and official registers are combined to create a longitudinal dataset spanning parents and children in 1865-1910 and 1935-1985 birth cohorts and observed at least every decade over the years 1880-1910 and 1950-2016. Both the census and register material cover the full population living in Sweden at each point in time, giving a total of 10.47 million children in the observed birth cohorts, who each are observed at multiple points in time. The 1880-1910 census material is of high-quality as it is compiled by local priests based on continuous parish registers. In these censuses I observe households and individuals, their occupations and various demographic and geographic characteristics (Swedish National Archives 2011a, 2011b, 2014, 2016). The 1865-1910 birth cohorts are observed in their parental household in at least one of these censuses (when < 15 years old). Both children and their parents are linked across census years by Björn Eriksson using probabilistic name linking methods (as elaborated in Dribe, Eriksson, and Scalone 2019; Eriksson 2015).

Cohorts born from 1935 are covered by modern multigenerational registers maintained by Statistics Sweden (SCB).¹¹⁷ Children born in these cohorts, and their parents, are observed in censuses from 1950 until 1990. These censuses contain occupational information as well as other demographic and geographic characteristics used here. The 1950 census is based on a poll-tax register compiled by county administrations, and has been digitized by a genealogy organization (Arkiv Digital 2015). The 1960-1990 censuses are digitized and provided by Statistics Sweden.¹¹⁸ Importantly, the 1950 census as well as all censuses and registers at Statistics Sweden are linked reliably using numeric personal identifiers introduced in Sweden in 1947. From 2001-2016 occupational information is recorded in occupational registers at Statistics Sweden. Presence in Sweden of individuals through 1968-2016 is retrieved from the register of the total population (RTB) at Statistics Sweden.

The available data on occupations differs over time. From 1880 to 1910, occupations were recorded by parish priests, in 1950 by county administrators, and the 1960-1990 censuses contain self-reported information on individuals' occupations. Occupational information is more detailed in 1950 than in later census years as original occupational strings rather than a coarser coding of occupations are available. Occupations in the occupational registers are reported by employers and

¹¹⁷ The multigenerational registers start with children born in 1932, but coverage is rather low for birth years before 1935. I therefore use the multigenerational registers for children born from 1935 onwards.

¹¹⁸ All modern register and census data used here are part of the Swedish Interdisciplinary Panel (SIP), a compilation of different official register and censuses starting in 1960 (hosted at the Centre for Economic Demography, PI: Jonas Helgertz).

reflect current employment. Of these sources, the occupational registers from 2001 are most limited, as they miss occupational information on individuals in project employment, larger non-salaried employers and most small employers (with 0-2 employees). This means that both high status occupations such as consultants or investors, as well as low-status occupations such as small shop-owners and other self-employed workers (e.g. construction workers, cleaners) are not included. Occupational coverage in the registers is better for the public than private sector, better for women than men, and better for Swedish-born than for immigrants (Statistics Sweden 2011).¹¹⁹ For my purpose of measuring social status, self-reported occupations are likely better than current employment, as they reflect the long-term rather than the current situation. I base occupational social status on the highest observed occupational status during adulthood. The restriction on observing both parents and children in adulthood means that 1885-1910 birth cohorts are only included if they are observed also in 1950 or afterwards, while 1865-1885 birth cohorts may be based on historical census data alone and 1935-1985 birth cohorts are based on census and register data from 1950 onwards.

Occupational information is recorded in string format in the 1880-1950 census data. These occupational strings are recoded into HISCO (Leeuwen, Maas, and Miles 2002) within the SwedPop project (www.swedpop.se). By using string descriptions of official occupational coding in the 1960-1990 censuses and ISCO coding of occupational registers, HISCO codes are appended also to modern occupational source data (originally in NYK-78, NYK-83, SSYK-96 and SSYK-2012 format). Beside NYK codes, the 1960-1990 censuses also include a socioeconomic index variable (SEI, Statistics Sweden 1982, 1989). I use a new translation key (Dalman 2022a) to link each NYK-78 + SEI combination to a HISCO code. This key places greater emphasis on hierarchical and skill-level differences than earlier more indirect routes from NYK to HISCO. Earlier translation keys by Erik Bihagen (Bihagen 2007) are used to match 2001-2016 occupational information to HISCO codes.

¹¹⁹ The occupational registers thus have more limited coverage of occupations, both as they reflect current employment (while a temporarily unemployed may report their future/previous occupation in self-reported censuses), and as they exclude certain occupational categories. As I am interested in (lifetime) social status rather than current employment I deal with this change by including all years of occupational information from registers, while only including occupational information at ten-year intervals based on censuses.

Table 1: Selection process: (a) total number of individuals observed in Swedish censuses (1880-1990) and registers (1968-2016) in given birth cohorts, share of these linked both longitudinally to themselves as adults, and to parents, and (c) share of these with observed occupations.

(a) Observations by cohort	1865-1880	1880-1895	1895-1910	1935-1950	1950-1960	1960-1970	1970-1980
Men	727,493	906,884	864,960	790,069	562,001	615,764	586,527
Women	711,902	881,332	834,764	761,490	531,495	583,918	557,156
N	1,439,397	1,788,343	1,699,724	1,551,559	1,093,496	1,199,682	1,143,683
(b) Subsample with sufficient links across time for both individuals and parents, as share of the above							
Men	48.71	42.75	56.86	89.11	87.67	80.68	84.04
Women	47.90	42.34	60.75	87.30	87.77	79.62	82.52
(c) Subsample with own observed occupation, as share of the above							
Men	85.59	95.58	97.64	98.38	96.95	96.04	94.79
Women	27.89	36.85	35.79	96.49	97.10	96.31	95.15

Table 1 summarizes the selection process from source data to the analytical sample. Selection in historical cohorts is due to not being able to link all individuals across time, as well as high emigration rates and – compared to today – relatively high mortality rates. Sample selection in modern cohorts is rather due to immigration; I do not observe parents to immigrants who arrive without their parents, and can therefore not include them in the sample (see for immigration statistics, Statistics Sweden 2021). For each cohort, time-invariant household characteristics are observed at the end year of a 10–15-year birth cohort. For example, for 1865-1880 birth cohorts, I observe birthplace (recorded separately from current residency) and other demographic and geographic characteristics in 1880. Occupational characteristics of both parents and children are observed at multiple points in time, in particular also in the end year of each birth cohort (for parents).¹²⁰ Children not observed after the age of 25 are excluded as these will not have reached occupational maturity at the time of observation.¹²¹ Furthermore, I need to observe at least one parent to address intergenerational transmission of social status and thus also select upon having at least one parent present at the end year of a 15-year birth cohort for historical data. In modern data these requirements translate into children staying in Sweden until adult age, and their child to parent link being registered in the multigenerational register.¹²²

¹²⁰ Summary statistics for occupational and demographic variables used in the analyses are shown in appendix table A.1 by 10-15-year cohort.

¹²¹ This restriction practically excludes women who are only observed early in their life-course as working in domestic service. Arguably, adolescent occupations such as women's domestic work before marriage are more comparable to education than gainful employment in later cohorts, in the sense that they reflect a specific youth stage in the life-course (e.g. Lundh 2004). Therefore, excluding such working experience increases conceptual consistency of the indicator of status attainment over time.

¹²² I let biological parents prevail over adoptive parents if both are observed but include adoptive parents to children with no registered biological parents.

Study Design

I perform statistical analyses to demonstrate to what extent two components of parental socioeconomic status affect child occupational status attainment, namely surname and occupational status (see the subsection on operationalizing occupational social status). More specifically, I aim to disentangle the effect of parental occupational status within surname groups as compared to across the full population. And vice versa, I aim to disentangle the effect of surname groups net of parental occupational status as compared to overall surname status persistence. Surname group is a categorical variable while occupational status is conceptualized on a continuous hierarchical status scale. The main metric of intergenerational occupational mobility used here is the intergenerational correlation in occupational status (similar to measures used in e.g. Song et al. 2020).

For parents in male breadwinner households, parental occupational status is based on the father's occupational status. For parents in dual-earner households, parental occupational status is the average of the father's and mother's occupational status (cf. Dalman 2022b). I first rank-transform occupational status of parents and children to account for changes over time and between generations in the occupational structure; my measure captures relative rather than absolute mobility. Then I additionally standardize the rank-transformation of occupational status.¹²³ The parent-child correlation is subsequently derived by regressing the occupational status of parents on the occupational status of children. Surname group fixed effects are added in some of the models to capture the average occupational status of each surname group. Using models with and without surname group fixed effects, I compare within-surname group intergenerational mobility with full-population mobility. Models with nominal outcomes are estimated for child high- and low-status attainment. Here linear probability models are used (cf. Mood 2010), and otherwise the same procedure is followed for parental occupational status as in the linear regression models.

¹²³ Standardization of the rank transformation is necessary to align standard errors across birth cohorts as the variance in occupational status scores changes and is limited. Standardization is by definition not necessary for a rank-transformed continuous variables such as income, but in most cohorts the occupational distribution is not sufficiently diverse to fill all percentiles, some individual occupations (e.g. farmer for men and domestic servant for women) comprise substantial shares (>10%) of the population.

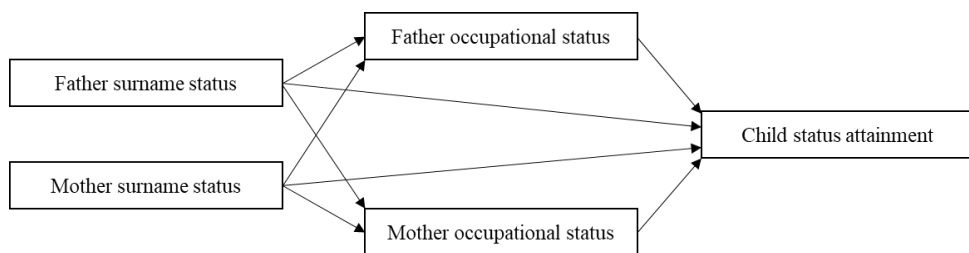


Illustration of expected relationship between different parental status indicators and child status attainment

The illustration above summarizes the expected relationship between both parental social status indicators and child status attainment. Based on theory and previous research as discussed above, I expect both parental occupational and surname status to influence child status attainment. I expect surname status to have a direct effect on child status attainment, to the extent that it captures components of socioeconomic status that are intergenerationally transmitted but not reflected in parental occupational status positions. I also expect surname status to have an indirect effect on child status attainment mediated by parental occupational status; this is for example the case if intergenerational mobility varies between surname groups. I do not expect an effect of parental occupational status on parental surname status, as surnames are generally heritable and predate parental occupations. Finally, I expect to see assortative mating so that the parental status indicators affect each other, again with parental surname predating parental occupational status. Child status attainment in the above model is operationalized as occupational status (see below for details), but alternatively operationalized as high-status attainment and low-status attainment in specific models.

When studying the above relationships empirically, I include basic controls for child birth year, child gender, occupational status observation year (see below), mother age at childbirth and father age at childbirth. Each of these characteristics is expected to affect child status attainment and to differ between cohorts, therefore controlling for these characteristics will make the results between cohorts more comparable.¹²⁴ Summary statistics on occupational status and control variables are shown by cohort groups in appendix table A.1.

Beside showing intergenerational occupational correlations within surname groups and across the full population, I also show the size of differences in expected child

¹²⁴ To include both direct and indirect effects, no further controls that may capture similar group-level processes of inequality of opportunity as captured by surnames and/or occupational status are included, e.g. sibsize, birth order, birth region, ethnic minority status, urbanicity, and immigrant status. However, in models including such controls not shown here, significant differences between surname groups and by parental occupational social origins remain.

status attainment depending on their surname status. I refer to these differences as ‘surname premia’ and compare other surname groups to a broad lower-status reference category, consisting mostly of patronymic surnames. I compare ‘gross’ and ‘net’ surname premia over time, where ‘gross’ reflects premia not controlling for parental occupational origin, and ‘net’ reflects premia controlling for parental occupational origin. These surname premia are presented in a non-intuitive unit (standard deviations) that is however comparable across cohorts. They reflect the expected difference between nominal categories in standard deviations change in rank position on the child occupational status scale. This means that changes over time in the sizes of surname premia represents changes in the strength of surname status inequality, rather than structural changes in the occupational structure.¹²⁵

As data quality is not equal across time, there are several limitations to the intergenerational correlation (IGC) measures used and their comparability over cohorts. In particular, the IGC values for 1881-1910 birth cohorts as well as 1975-85 birth cohorts are less reliable and likely biased downwards by measurement error. For 1885-1910 birth cohorts I cannot observe own occupational status until 1950.¹²⁶ Their occupational status is thus observed at relatively old ages and after a period of rapid industrialization and economic growth. Their parents’ occupational status, in contrast, is observed in or before 1910 – often substantially earlier in their life-cycle and in a different economic context. Although occupations are more stable than income over the life-cycle, this combination of substantial structural and life-cycle differences between parents and their children likely results in a downward bias of the IGC estimates for these cohorts and I therefore will not interpret differences in mobility levels between these and other cohorts substantively.

The IGC estimates for cohorts born since 1975 are also biased downwards due to life-cycle bias in occupational attainment, and increasingly so for each subsequent cohort (Bihagen, Shahbazian, and Kjellsson 2022). I observe their occupations in or before 2016, when they are aged 40 or below. It has been shown that individuals in these (and earlier) Swedish cohorts do not reach occupational maturity until they reach relatively high ages, and therefore parental occupational status will artificially be higher than children’s occupational status among these cohorts – biasing the IGC downwards (cf. figure 2, and Bihagen, Shahbazian, and Kjellsson 2022). Thus, while point estimates for cohorts born after 1975 are useful to compare the Swedish population with the subsample with Swedish background, I do not ascribe substantive meaning to time trends for cohorts born after ca. 1975.

¹²⁵ Premia are affected by changes in surname group size over time, as shown in figure 1.

¹²⁶ For 188-85 birth cohorts, occupational status is either observed before age 30 in 1910, or at age 65-70 (possibly retrospectively) in 1950. This results in substantial variation in children’s occupational status among these birth cohorts which is not related to their ‘prestige’ but to economic development and life-cycle differences.

Measuring social status using occupations

Occupational information is commonly used in the mobility literature to derive either social class belonging or social status on a continuous hierarchical scale. Social class, a categorical division of occupational groups, is often used in the social mobility literature as class relations are generally seen as not reducible to a one-dimensional hierarchical scale (e.g. Breen and Müller 2020; Erikson and Goldthorpe 1992). However, occupational ‘prestige’ (here referred to as Weber’s ‘status’ concept) has a long tradition of being summarized on such a scale, for example using Treiman’s prestige scale (Ganzeboom, De Graaf, and Treiman 1992; Treiman 1977). There is also a long-standing consensus on the transferability of occupational prestige scales between different temporal and geographical contexts, referred to as the Treiman constant (Hout and DiPrete 2006). To capture Weberian social status using occupations, the focus should be on social interactions (see earlier theoretical discussion of the status concept). This is what I do here using the HISCAM status scale (Lambert et al. 2013).

The HISCAM scale is the historical counterpart of the modern CAMSIS scale (Prandy and Lambert 2003). It captures the social distance between occupations by using social networks as reflected on marriage certificates. Such social networks consist of individuals occurring on the same marriage certificate, for example a father and his son in law. Social distances between occupations are defined as the likelihood of occupations ‘meeting’ on a marriage certificate. The data underlying the HISCAM occupational status scale covers seven countries, including Sweden, and the period 1800-1938.¹²⁷ In the sample on which it was defined HISCAM ranged from 1 to 99 and had a mean of 50 and standard deviation of 10, with higher values indicating higher social status (Lambert et al. 2013). Appendix table A.1 shows the distribution of the HISCAM scale across the study sample used in this paper. Figure 2 shows the average HISCAM score of children, fathers, and mothers across child birth cohorts and by surname group (see background section).

To generate comparable intergenerational correlations across cohorts, the HISCAM scale is both rank-transformed and standardized in the analyses conducted in this paper.¹²⁸ As the development of social status over the life-course may differ between

¹²⁷ I use the universal version HIS-CAM scale (version 1.3.1.U2) for both men and women, despite it being based on *male* occupations. This U2 version is recommended for usage by the authors of the scale, and has therefore been applied in most previous work. It therefore gives higher comparability between studies to use this version. The same scale should be used for men and women so that men and women with the same occupation are assigned the same social status. There is a HISCAM scale which includes both genders (U1), but as married women often are not engaged in the labor force in the period observed (not at all in the Swedish HISCAM sample) this scale mostly includes young women and occupational proximity becomes conflated with age and life-course transitions.

¹²⁸ Individual HISCAM scores are ranked based on the social structure among individuals in birth (or parental) cohorts spanning 10-15 years. Thus, the rank transformation controls for long-term structural change (occupational upgrading). The rank transformation is generated for all

cohorts and by gender, for example due to childbirth, I consistently use the highest attained HISCAM value over the life course (limited to working ages) to reflect an individual's social status (see e.g. Härkönen et al. 2016). Highest attainment occurs at different ages and is therefore less dependent on cohort or gender differences in career trajectories than occupational attainment in a specific age range.

While child status attainment is defined using occupational status scores in the main analyses, the outcome in some analyses is instead high-status or child low-status attainment. High- and low-status attainment are defined using an established historical social class scheme, commonly used in historical stratification research (Van Leeuwen and Maas 2011). High-status attainment is defined as attainment of any of the managerial or professional classes (for 1865-1910 birth cohorts), or higher managerial and professional classes (for 1935-1980 birth cohorts). Those whose highest attainment is in low- or unskilled manual classes are defined as the low-status attainment group for all cohorts.¹²⁹

individuals regardless of gender in order to give men and women with the same occupations the same HISCAM rank.

¹²⁹ Despite a more complex interpretation due to changing group sizes, these nominal categories are preferred over a percentile range as the cut-off point in such a range often is not meaningful; in some cohorts those above and below the threshold will substantively have the same social status, even if values differ marginally.

Results

Surname groups as a status indicator: intermarriage

Figure 3 shows surname group intermarriage patterns for parents to children born 1865-80, 1935-50 and 1970-80. More specifically, these figures show the share of each surname group that would partner and have children with each other surname group if all surname groups were equally large (i.e. after biproportional fitting).¹³⁰ This means that the figure can be read ‘from top to bottom’ as well as ‘from left to right’.

The figure should be interpreted as follows: if no surname intermarriage occurred, all bars in the figures would look the same and $1/6^{\text{th}}$ (17%) of marriages in each father surname group would be with mothers from any mother surname group, i.e. the colored bars would be equally wide. Thus, higher or lower shares than 17% show surname intermarriage patterns. For example, among mothers of the 1865-80 cohort bearing a nobility surname, 68% would be married to a father with a nobility surname, rather than 17% as expected without surname homogamy. In contrast, only 1.5% (rather than 17%) of these mothers with nobility surname would be married to a mother bearing a lower-status surname. Among mothers without observed surname (mostly first-, second-, and third-generation immigrants) to the 1970-80 cohort, 69% (rather than 17%) would be married to a father without an observed surname. Only about 6-7% of these mothers would be married to the common Swedish surname groups, and less than 4% to Swedes with surnames originating from the nobility.

¹³⁰ Note that when referring to ‘intermarriage’ here, I actually refer to fathers and mothers who have children born in a given birth cohort. Parents are not distinguished by their marital status, i.e. also the substantial share of unmarried parents is included.

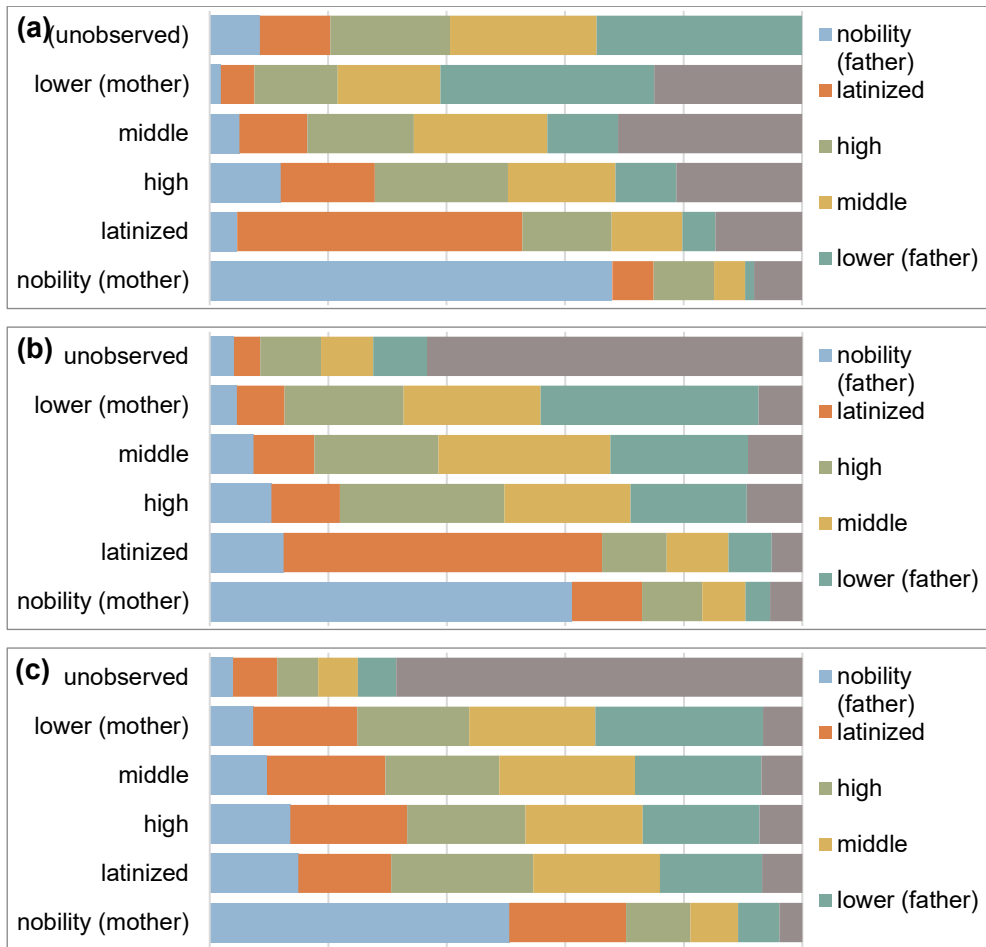


Figure 3 Surname intermarriage: Share of each surname group that would intermarry if all surname groups were equally large (i.e. after biproportional fitting), among parents to the (a) 1865-60 cohort, (b) 1935-50 cohort, (c) 1970-80 cohort

Generally, figure 3 shows substantial surname status homogeneity. Thus, surname group belonging can be seen as a status indicator for each of these cohorts of parents. Beside homogamy, there are patterns of assortative mating where marriage with someone closer in surname status is more likely than marriage with someone with a very different surname status. The surname group with lowest (occupational) status is changing from Swedish lower status surnames to non-Swedish surnames in more recent cohorts (cf. figure 2, and Dalman et al. 2022). Generally, the figures show the highest surname homogamy among elite- as well as among lower-status (recently: non-Swedish) surname groups. The different surname origins in the middle of the status distribution gradually become less important for marriage

patterns. Surname status homogamy, among those with Swedish-origin surnames, is clearly higher historically than today. The distinction between the two common surname groups with middle and lower status has become rather small by the 1970s birth cohort. These distinctions were still substantial among parents to the 1935-50 birth cohort. In the 1970s cohort endogamy among those with and without a Swedish background, together with elite homogamy, are more prevalent than other forms of surname assortative mating. Thus, historical but also new (foreign) surname groups have persistently formed important status markers in a Weberian sense for those reaching occupational maturity in twentieth century Sweden, but non-elite pre-industrial distinctions lose their relevance in the twenty-first century and are replaced by ethnic distinctions.

Stable intergenerational status correlations in the long run

Intergenerational mobility of social status is increasingly studied using a hierarchical continuous measure of occupational status and rank-rank associations, and I follow this practice (see earlier sections, and e.g. Song et al. 2020). In figure 4 the intergenerational correlation (IGC) between parental occupational status and child occupational status attainment is shown for annual cohorts born 1865-1985, using four different specifications. The black solid line depicts parent-child associations among the full Swedish population. The grey dashed line reflects parent-child associations from a model adding surname group fixed effects. That is, it shows parent-child associations *within* surname groups. The green solid line depicts parent-child associations among those parent-child pairs with a Swedish background; children are included in a cohort if they are Swedish-born and both their parents are Swedish-born.¹³¹ Finally, the green dashed line shows parent-child associations *within* surname groups among those with a Swedish background.

¹³¹ This subsample with a Swedish background includes ca. 99% of the population in 1865-1910 birth cohorts and thereafter decreases to include 87% of the cohort born in the 1950s, 80% of the 1970s cohort, and 75% of from the 1980-86 birth cohorts.

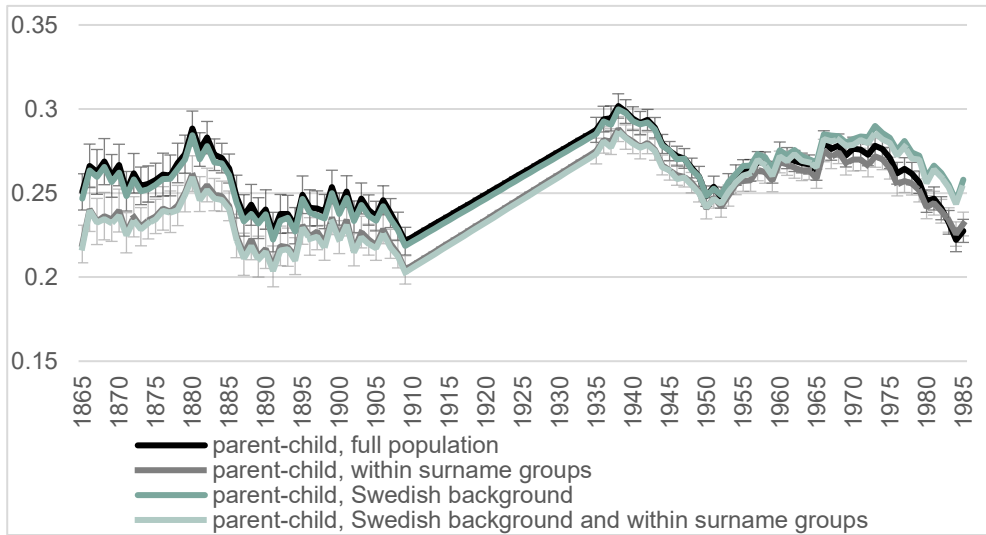


Figure 4 Intergenerational correlation (IGC) between parental occupational status attainment and child occupational status attainment.¹³² Parental status is father highest attained HISCAM if mother not employed, otherwise average of father and mother; child highest attained HISCAM after age 25. Without (dark) and with (light) controls for parental surname status, for all Swedish cohorts born 1865-1985. Solid lines indicate intergenerational correlations among the full population, dotted lines indicate correlations among those with a “Swedish background” (defined as being Swedish-born with two Swedish-born parents, applies to ca. 99% of the sample historically and ca. 80% among those born in the 1970s). Adjusted for basic temporal control variables and standardized (i.e. same variation in all cohorts and between generations).

Long-term trends in the IGC are shown here to answer several questions. Firstly, I aim to answer the question whether intergenerational mobility has increased or decreased across Swedish cohorts born in different economic and welfare contexts. Specifically, I ask whether changes in mobility levels occur simultaneously with changes in the Swedish socioeconomic context. Secondly, I evaluate whether intergenerational mobility within surname groups differs from mobility among the full population, and whether this changes over time. This question is linked to the previous question and I describe how differences between within-group and full population mobility increase or decrease in a changing economic and welfare context. Thirdly, as time trends in intergenerational mobility are expected to differ between groups with and without a Swedish background, trends are also shown specifically for the subsample of the Swedish population with a Swedish

¹³² See main text for limitations. Time trends cannot be interpreted substantively for cohorts born ca. 1885-1910 and after 1975.

background. The distinction of those with a Swedish background is used to clarify trends in full-population and within-surname group mobility.¹³³

Figure 4 shows highly stable levels of intergenerational mobility across cohorts born in very different economic and welfare regimes. The intergenerational correlation fluctuates around 0.27 over the entire period covered. While the overall stability is remarkable, some substantive trends can be distinguished. Firstly, mobility is persistently higher for cohorts reaching adulthood in the midst of industrialization (1865-80 birth cohorts) than for 1935-40 birth cohorts. These latter cohorts, as well as their parents, reached adulthood when most of the structural transformation of the Swedish economy was completed. They did not yet benefit from important welfare reforms – they especially did not attend comprehensive primary schooling. Among cohorts born before the introduction of comprehensive schooling, children from high-status backgrounds, including those in high-status surname groups, more often attended high-quality private or public schools than did children with other social origins (e.g. Breen and Jonsson 2007; Meghir and Palme 2005).

During the 1950s and 1960s, comprehensive primary schooling was gradually introduced. As a result of this reform, opportunities to attend higher secondary education (*gymnasium*) were equalized as tracking was abolished. In line with previous research, I find clear increases in intergenerational mobility among 1940-1950 birth cohorts who were gradually exposed to comprehensive primary schooling (cf. Holmlund 2008; Meghir and Palme 2005).¹³⁴ However, this increased intergenerational mobility occurring simultaneously with the introduction of comprehensive schooling did not persist in later cohorts. Among cohorts born from 1953 until 1975, reaching occupational maturity in 1980-2016, mobility levels in Sweden again decreased. In Sweden, mothers increasingly participated in the labor force during especially the 1970s, creating stronger (observable) parent-child associations in occupational status (Dalman 2022b).

Mobility trends for those with a Swedish background start to diverge from overall mobility trends among cohorts born from the late 1950s and reaching occupational maturity after 1980. Mobility decreased among 1960-75 birth cohorts, but barely so if including parent-child pairs with foreign origins. Those with a Swedish

¹³³ Full-population intergenerational mobility among recent birth cohorts is substantially higher when including individuals with foreign origins, for whom I often do not observe occupational status as they are often not recorded as employed. This is in part due to the exclusion of self-employed and small employers from the occupational registers, in which immigrant groups are overrepresented. Comparability between this group with foreign origins and those with Swedish background or earlier cohorts is therefore complicated.

¹³⁴ Mobility starts increasing earlier than the implementation of comprehensive schooling started (in 1949), and the increase ends before all cohorts of children attend comprehensive schools. Mobility decreases for cohorts born after 1953. Children born after 1953 were generally exposed to comprehensive schooling at least from grade 5, although implementation of the schooling reform was not fully completed until around 1970 (see for details Marklund 1981).

background included virtually all Swedes in earlier cohorts and therefore it is no surprise that mobility levels did not differ earlier between the full population and those with a Swedish background. However, I observe substantially higher intergenerational mobility among the increasing group with foreign origins in more recent cohorts, which affects full-population mobility trends (see also table 6, IGC among those with an ‘unobserved’ surname group).¹³⁵

Overall, mobility thus decreased somewhat among 1865-1935 birth cohorts, subsequently increased more substantially among cohorts born until 1950, and then again decreased among cohorts born until 1975. This roughly reflects decreasing mobility as the move out of agriculture was completed (see also by surname IGC results), increasing mobility as comprehensive schooling was introduced, and decreasing mobility in more recent cohorts. These most recent cohorts experiencing decreasing intergenerational mobility are characterized at the same time by the expansion of tertiary education, new school reforms, and increasing economic inequality – especially in terms of non-wage incomes. However, as I show in another paper, the main factor contributing to observed decreasing mobility across these cohorts is the increasing (measurable) impact of mothers’ occupational status on child status attainment as mothers’ labor force participation increases (Dalman 2022b).

So far, I have described overall mobility trends without considering surname groups. The dashed lines in figure 4 show occupational correlations *within* surname groups and the gap between the solid and dashed lines thus shows how within-group mobility differs from full population mobility. The figure demonstrates higher mobility within surname groups than across the full population historically; across 1865-1945 birth cohorts, within-group mobility is significantly higher than full population mobility.¹³⁶ The full population IGC around 1870 is 0.265, compared to 0.235 within surname groups. For those born in the late 1930s, the full population IGC is around 0.295, compared to 0.280 within surname groups. Compared to long-term changes in mobility levels across the full population – which are highly stable – these differences are substantial. In terms of life chances, the difference is perhaps not substantial across the full population, although I will show in the next section

¹³⁵ An earlier study on intergenerational income mobility among immigrants in Sweden found *lower* mobility among immigrants than among natives (Hammarstedt and Palme 2006; also cf. Borjas 1992). This is also what I find in terms of occupational mobility for earlier cohorts with foreign backgrounds (e.g. among 1935-50 birth cohorts, results not shown here but available upon request). This change is likely related to the changing composition of foreign-born populations in Sweden (as already suggested in Hammarstedt and Palme 2006).

¹³⁶ Note that not each of the annual point estimates differs significantly between within-group and full population. But during the period of 1865-1945 I observe significant and consistent differences in most years, and since these differences are consistent across models for different birth cohorts, their combined significance is higher than that of each annual point estimate (as can be quantified by grouping birth cohorts, not shown here).

that differences *within* surname groups are substantive. During the 1940s, the within-surname and full population IGC converge rapidly and for cohorts born after 1950 the within-surname and full population IGC are virtually the same, especially among those with a Swedish background (green lines).

For cohorts born in late nineteenth and early twentieth century, Sweden surname groups thus function to create persistent group-level (dis)advantages in terms of children's occupational status. Pre-industrial status groups thus function to create intergenerationally persistent group effects in a similar way as "ethnic capital" has been shown to do in both the Swedish and US contexts (Borjas 1992; Güell, Rodríguez Mora, et al. 2018b; Hammarstedt and Palme 2006; Torche and Corvalan 2018). In subsequent sections, I first describe the size of such "surname premia" (or disadvantages), and then turn to IGC estimates within each surname group. The IGC estimates within different surname groups describe different time trends in mobility among different social strata and give a more detailed picture of the relationship between surname groups and occupational status in processes of intergenerational persistence than the overall within-group estimates shown in figure 4.

Reduced but persistent surname group premia

In this section, I show surname group premia for different combinations of maternal and paternal surname groups, and their change over birth cohorts. In the main analyses I explicitly distinguish the surname group belonging of both parents to clarify both the possible advantages associated with double elites (with two parents with elite surname status), but also to demonstrate possible advantages of broader shares of the population who have at least one parent with a higher- or elite-status surname. As shown in figure 1, around 5% of cohorts born since 1935 has either at least one elite surname status parent, or two higher surname status parents (i.e. they belong to one of the groups depicted in the upper panel of figure 5).

There is a high degree of similarity between premia derived from maternal and paternal surname background, and I therefore include parental surname combinations without regard for gender in the main analyses. Appendix figure A.1 shows 'gross' surname group premia for maternal and paternal surname groups separately and this gender similarity can be seen there. The gender similarity in surname premia is in itself an interesting result for several reasons. Firstly, historically virtually all children in two-parent families used their fathers' surnames, rather than their mothers. Fathers' surnames could therefore affect child occupational status attainment through name connotation, while mothers' surnames – which remain unobserved for potential employers of children – cannot. Secondly, other socioeconomic characteristics are generally found to have affected children differently by parental gender, at least historically. For example fathers' income and

social class have historically been more consequential than mothers' for children's socioeconomic outcomes (Beller 2009; Fertig 2003; Goldthorpe 1983).¹³⁷

In figure 5, black solid lines show 'gross' surname premia from models only controlling for basic temporal control variables. These 'gross' premia do not control for parental occupational status, which is expected to partially mediate the relationship between surname status and child status attainment. The grey dashed lines show 'net' surname premia from models including parental occupational status as a control variable.¹³⁸ As child status attainment is rank-transformed and standardized, the premia values reflect that the expected number of standard deviations increase or decrease in HISCAM rank of a given surname group as compared to the reference category. While this value has no obvious substantive interpretation (and neither do the original HISCAM values), it has the benefit of being comparable across cohorts and across surname groups. Lower-status surnames, mostly composed of patronymic surnames, are used as the reference category for all other surname groups and across cohorts. This group is relatively large (see figure 1) and its relative position in the surname status distribution only changes over time as 'unobserved' (mostly immigrant) names with low occupational status increase in prevalence, but is otherwise stable.

¹³⁷ It should be noted that gross surname premia of one parent partly reflect the surname status of the other parent through surname intermarriage, but if paternal surnames had been substantially more consequential, I would have seen differences between paternal and maternal surname premia despite the occurrence of surname intermarriage.

¹³⁸ Not all parental surname combinations are visualized in figure 5. The groups excluded from figure 5 are shown in appendix figure A.2.

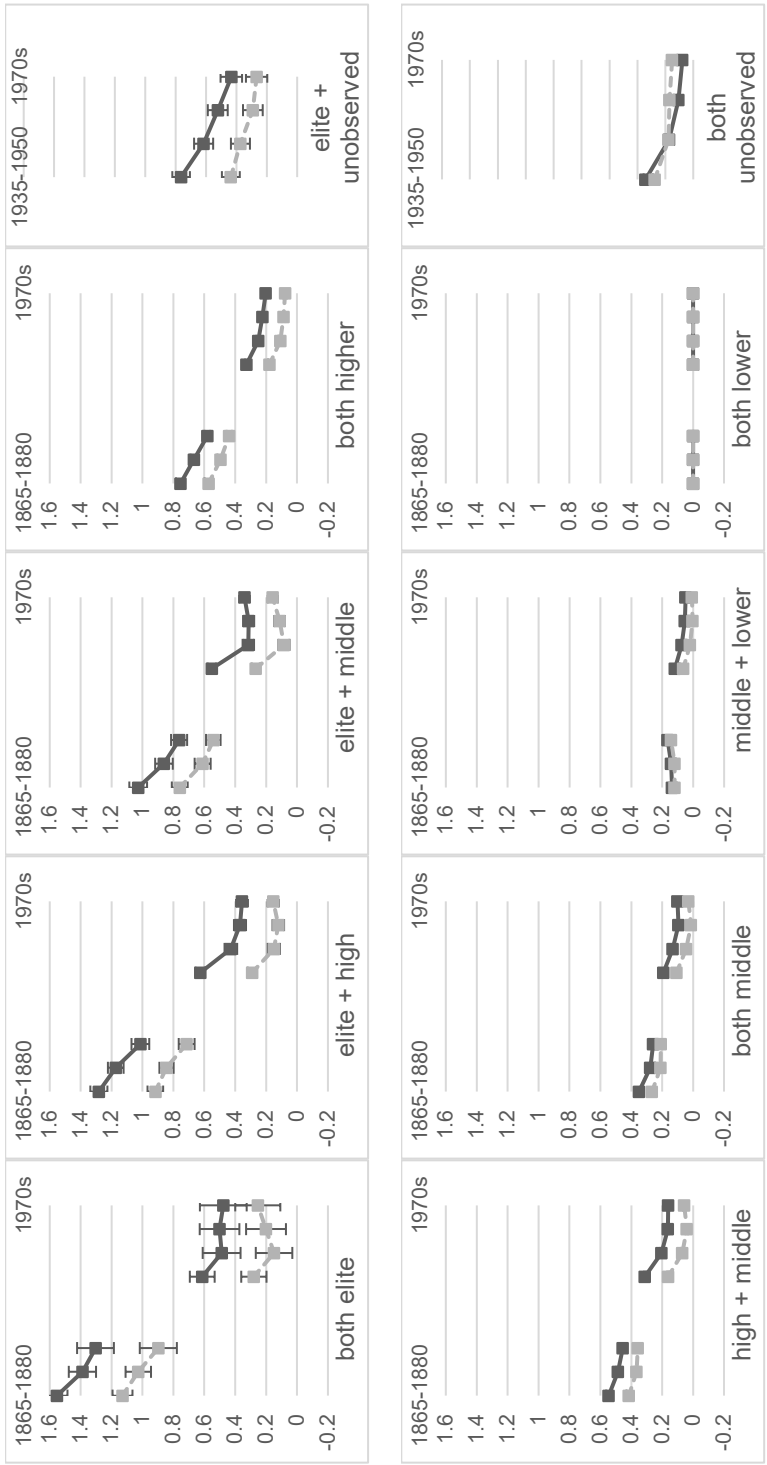


Figure 5 surname premia: each line marks the surname premia for a specific parental surname group, as labeled. Solid lines show 'gross' surname premia, not controlled for parental occupational status. Dashed lines below each solid line show respective 'net' surname premia, controlled for parental occupational status (average of both parents, or fathers' if mother is not observed employed). Surname premia are shown for all the different "higher" surname status combinations (as in figure 1-2) and a selection of middle/mixed/lower surname combinations (see appendix A.4 for other surname combinations).

Descendants of pre-industrial elites, those with ‘nobility’ or ‘latinized’ surnames, have the highest surname premia throughout the period studied. The gross surname premium associated with having two elite surname parents ranges from 1.6 standard deviations for 1865-80 cohorts to 0.5 standard deviations for 1950-1980 cohorts. These differences are substantial; for example, in a normal distribution a 0.5 standard deviation jump takes one from the 50th to the 69th percentile. Elites are followed in average occupational status by other pre-industrial high-status surnames (‘high’), reflecting mostly the educated upper classes of the nineteenth century, with gross surname premia ranging from 0.8 standard deviations for 1865-80 cohorts to ca. 0.25 among 1950-80 cohorts. Those with (petty) bourgeoisie ‘middle’ status surnames experienced a gross premia of almost 0.4 in 1865-80 cohorts and only ca. 0.1 by the 1950-80 birth cohorts.¹³⁹

The differences between surname groups decrease substantially over time, especially across the 1865-1950 birth cohorts. In later cohorts the remaining surname premia remain largely unchanged. By then, differences between those with common (middle and lower status) Swedish surnames have all but disappeared – especially when controlling for parental occupational status (grey dashed line in figure 5). However, even for recent birth cohorts and even after controlling for parental occupational status, a net surname premia persists among descendants of those with high-status and elite surnames (all surname combinations in the upper half of figure 5). Individuals with these surnames can thus expect, on average, to attain a higher occupational status than individuals with other surnames given the same parental occupational status, even among the most recent birth cohorts.

Long-run mobility trends differ by surname group

The previous sections summarize the association between parental occupational and surname status with child status attainment at the full population level. I also show to what extent these two components of social origin complement each other or capture similar aspects of social origin. From these results it remains unclear whether surname status origin and parental occupational status matter for the same groups in the population, and for the same aspects of child status attainment – or rather for different groups and outcomes. In this section I estimate the intergenerational correlation in occupational status within each surname group, rather than across the full population. This uncovers differences in intergenerational occupational mobility across surname groups as well as differences in mobility trends over time between surname groups. I also estimate the association between parental occupational status and child status attainment at different points in the

¹³⁹ Note that in any distribution with more individuals around the mean than in the tails, as for example the occupational status distribution, a given unit of standard deviations change means a larger change in percentile position when closer to the mean.

distribution (high- and low-status attainment), to see whether surname status affects this association differently at different points in the distribution.

Based on analyses using linear probability models, figure 6 shows the intergenerational association between parental occupational status attainment and child high- and low-status attainment, otherwise using the same specifications as in figure 4. The lower association between parental occupational status and child attainment *within* surname groups as compared to the full population specifically applies to attainment of high-status positions. Adding surname group fixed effects does not affect the association between parental occupational status and low-status attainment either historically or today, as demonstrated by the overlapping dashed and solid lines in figure 6(b). In terms of high-status attainment, the same surname group effects as seen in the IGC estimates is apparent; on average, mobility is somewhat higher within than between surname groups for cohorts born until around 1945. Some of the intergenerational persistence of high-status attainment can thus better be attributed to group-level surname status persistence, rather than parent-child associations.

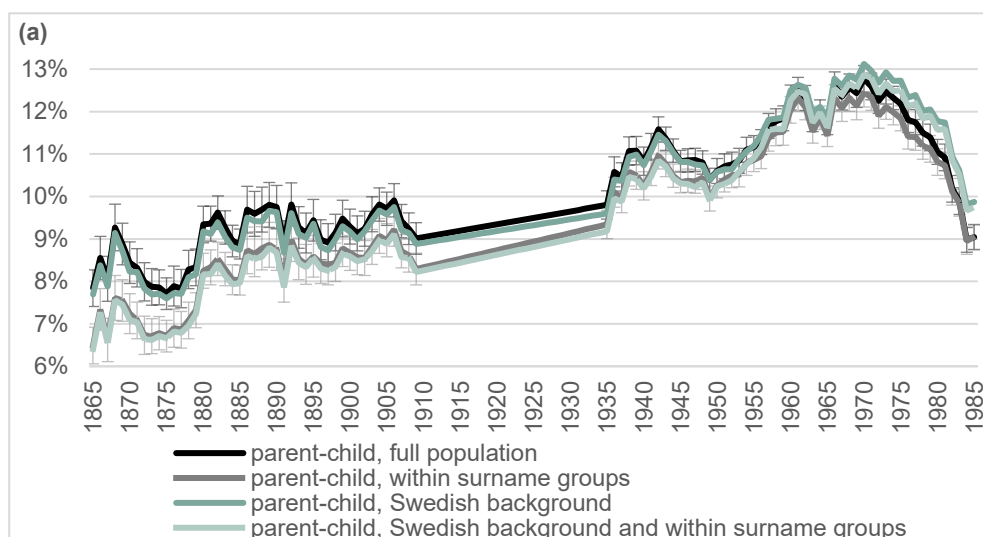


Figure 6 Intergenerational association between parental occupational status attainment and child (a) high- or (b) low-status attainment (continued on next page).

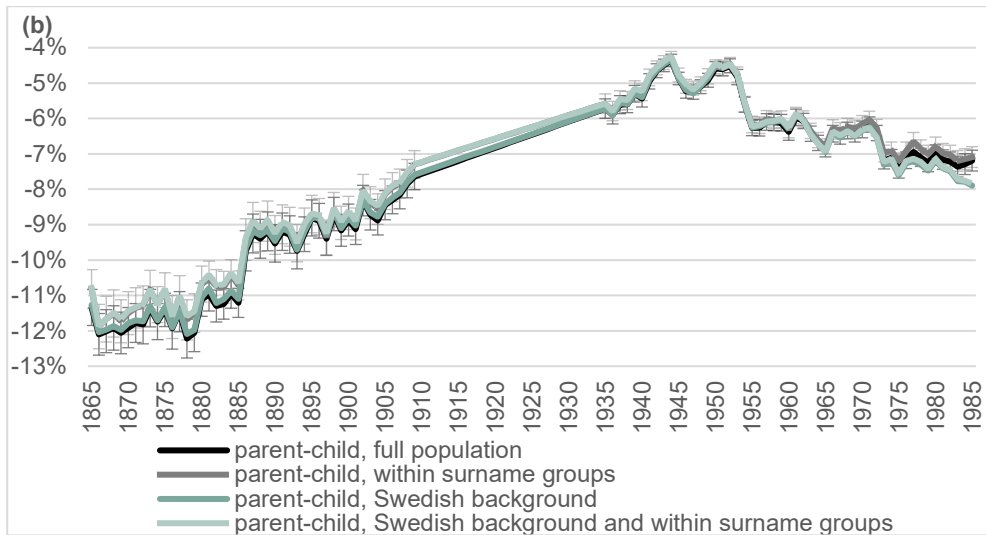


Figure 6 Intergenerational association between parental occupational status attainment and child (a) high- or (b) low-status attainment.¹⁴⁰ Association given as “if parental occupational status increases by one standard deviation, then the likelihood of high-/low-status attainment in/decreases by the percentage points given on the y-axis” (can be compared with the full population probability for each cohort as given in appendix table A.2). Without (dark lines) and with (light lines) controls for parental surname status, for all cohorts born in Sweden 1865-1980 (x-axis). Solid lines indicate intergenerational correlations among the full population, while dashed lines indicate correlations among those with a “Swedish background”. Adjusted for basic temporal control variables and standardized.

Long-term intergenerational transmission patterns across the full population differ between high-status and low-status attainment. Over 1865-1950 birth cohorts, the overall likelihood of high-status attainment doubled, while the percentage point increase associated with one standard deviation increase in parental occupational status (as shown in figure 6(a)) increased by about 30%. Thus, overall intergenerational transmission in terms of high-status attainment decreased substantially as surname status persistence decreased. Among 1950-70 birth cohorts, intergenerational transmission in terms of high-status attainment instead increased somewhat. In contrast, intergenerational transmission of low-status attainment was substantively constant over the long run, with some increasing transmission for cohorts born after 1950.

These different long-term mobility trends for different parts of the occupational structure are mirrored by different long-term mobility trends for different surname groups. I observe long-term increases in mobility among high-status surname groups but long-term decreases in mobility among low-status (Swedish) surname

¹⁴⁰ See main text for limitations. Time trends cannot be interpreted substantively for cohorts born ca. 1885-1910 and after 1975.

groups. This is summarized in figure 7. The figure shows the occupational intergenerational correlation within surname groups historically, among 1865-80 birth cohorts (diamonds), and today, among 1970-80 birth cohorts (triangles). The average full population intergenerational correlation among each of these cohorts, which is virtually identical, is also shown as a dotted or dashed line, respectively.

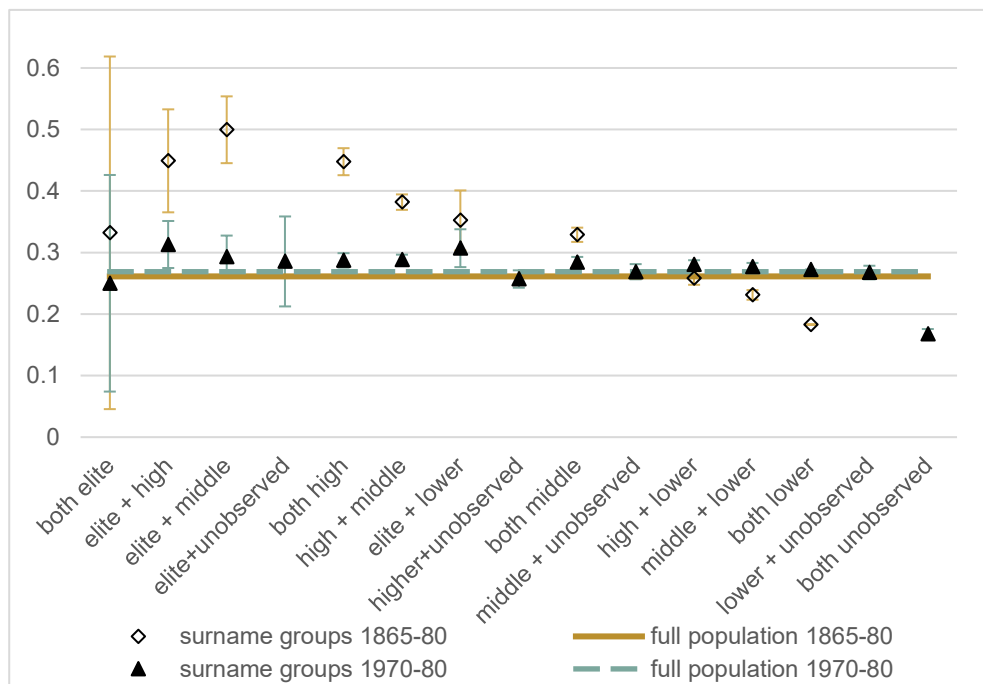


Figure 7 IGC within surname groups, for historical (1865-80) and recent (1970-80) birth cohorts. Full population IGCs are identical to those given in figure 4 (aggregated over historical/recent cohorts).

Among 1865-80 birth cohorts – and thereafter also among 1880-1910 cohorts not shown here, I observe clear differences between surname groups in the occupational intergenerational correlation. Outside of the very elite, high-status surname groups display substantially higher intergenerational occupational persistence than low-status surname groups, with intergenerational persistence decreasing by surname group status.¹⁴¹ The intergenerational correlation is 0.45 among those with high-

¹⁴¹ Results among those with two elite surname status parents are unstable because of small sample size. Generally, the IGC is substantially smaller among this upper elite than among other surname groups and does not differ significantly from zero for 1895-1910 birth cohorts. Thus, in this small elite, very high group-level surname premia appear to go hand in hand with little parent-child transmission of occupational status: children in this group are expected to attain high-status positions in the occupational social structure regardless of their parents' occupational social status.

status surnames, 0.33 among those with middle-status surnames, and only 0.18 among those with lower-status surnames. By the 1970s birth cohort, most of these differences have faded out; the intergenerational correlation among all surname groups reflecting Swedish origins is then around 0.27-0.29. Among those with 'unobserved' surnames (non-Swedish origins from both parents), the intergenerational correlation is much lower at 0.17.

As the overall differences in within-surname and full-population intergenerational correlations, these differences in occupational correlations are persistent across cohorts born across the late nineteenth and early twentieth centuries and disappear rapidly for cohorts born in the 1940s. Since the 1950s, the only change in occupational correlations occurring between surname groups is the divergence between those with 'unobserved' surnames and the rest of the population; occupational intergenerational correlations among those with a Swedish surname background become higher than among the rest of the population, also in line with results shown in figure 4. These results imply different long-term trends in intergenerational mobility across surname groups. Those with high-status surnames experienced increasing intergenerational mobility during the twentieth century, those with middle-status surnames stability, and those with lower-status surnames experienced decreasing intergenerational mobility.

Concluding discussion

Occupational status mobility has been surprisingly persistent over the past hundred-fifty years in Sweden. Intergenerational correlations across the full population are consistently around 0.27. These levels of mobility are highly similar to those found for the US using similar methods and data (Song et al. 2020). In the US, too, correlations are persistently found to range between 0.25-0.30 after the first phase of industrialization. Finding similar intergenerational occupational mobility in Sweden as in the US stands in stark contrast to the Great Gatsby Curve pattern in terms of income mobility; Sweden shows comparatively low income inequality and income mobility in international comparisons today – substantially lower than the US (cf. Corak 2013; DiPrete 2020; Durlauf, Kourtellos, and Tan 2022). My findings are in line with earlier research showing a “mobility paradox” for the Nordic countries; levels of occupational and educational mobility are very similar between the US and Sweden today, despite large differences in income mobility (e.g. Beller and Hout 2006; Breen and Jonsson 2005; Breen, Mood, and Jonsson 2016; Karlson 2021). My findings suggest that levels of occupational mobility in Sweden have been similar to those in the US at least since industrialization completed.

I find that an increase in mobility over 1930-50 birth cohorts is followed by a slight decrease in mobility over 1950-80 birth cohorts, also like findings for the US (Song et al. 2020). Sweden and the US mainly differ in the nineteenth century, as first the US and later also Sweden industrialize. Among early US cohorts the intergenerational move out of agriculture results in very high mobility levels (0.175). In Sweden, I observe similarly high mobility levels among the cohort most affected by the transition out of agriculture, but only among those with patronymic surnames. This is the social group most affected by this transition in Sweden. The overall lower mobility in Sweden as compared to the US during industrialization can be linked to particularly low intergenerational mobility in occupational status among pre-industrial elites and broader high-status groups observed in Sweden.

I find that surname status origin matters even net of occupational status. Even for children born almost a hundred years after the start of the democratization and industrialization process in Sweden, and for adults still in the labor market at the turn of the twenty-first century, pre-industrial surname status origins matter – also net of parents’ occupational status – for children’s status attainment. Surname status origin affects intergenerational occupational mobility as individual-level intergenerational correlations differ by surname group. For cohorts born until 1945, intergenerational mobility is significantly higher *within* surname groups than across the full population. Part of full-population intergenerational correlations in occupational status are thus better captured as group-level surname status persistence. Long-term trends in intergenerational mobility differ substantially

between surname groups; high-status groups experience increasing mobility, while low-status groups experience decreasing mobility over the past hundred-fifty years.

Over the past hundred-fifty years, children to ancestors of higher-status pre-industrial surname groups are persistently expected to attain, on average, higher occupational status than their peers descending from lower-status surname groups. These differences are surprisingly constant over time. I see that having a (mixed) elite surname status origin gives an expected surname premia of about one standard deviation for 1865-80 birth cohorts. By the 1970s cohort, this surname premium has decreased to about 0.4 standard deviations. The surname premium of the (petty) bourgeoisie, compared to those with lower-status Swedish surnames, was nearly 0.4 in 1865-80 and decreased to 0.1 by the 1970s birth cohort. Even after controlling for parental occupational status, surname premia persist to some extent, and remain significant for elite- and high-status surname groups, as compared to lower-status Swedish surnames. These persistent surname premia may be related to the way in which Nordic welfare regimes equalize the opportunity structure; equalization is largely a bottom-up process where equal opportunities are created for those with disadvantaged social origins as compared to those with average social origins (Esping-Andersen 2015; Esping-Andersen and Wagner 2012). Surname status persistence, in contrast, is strongest among high-status groups and for high-status attainment – and therefore might not be affected by welfare state policies.

Both occupational and surname status persistence are higher among higher-status than among lower-status surname groups – especially historically. Among these groups, surname status premia persist also in the most recent cohorts and have not decreased in size between cohorts born from 1950 to 1980. Similarly, surname status does not matter for an individual's probability to end up in lower-class positions, but matters greatly for higher-class attainment – especially among cohorts born before 1945. These differences are reflected in substantially higher parent-child correlations in occupational status among high- and middle-status surname groups than among the full population in cohorts born through 1865-1910. These high correlations are mirrored by low parent-child correlations among those with lower-status surname groups; the majority of the population with patronymic surnames and often agricultural origins.

Differences in mobility levels across the population are likely related to industrialization and the move out of agriculture among children with lower-status surname origins. They also imply that intergenerational mobility was lower historically among social groups less affected by industrialization, e.g. those in the service sector, and that among these groups intergenerational mobility increased over the past hundred-fifty years.¹⁴² For those with high-status surnames the

¹⁴² These differences in intergenerational mobility reflect *relative* mobility differences, i.e. after controlling for overall changes in the occupational structure.

intergenerational correlation (IGC) was 0.45 for the 1865-80 birth cohort, compared with 0.3 for the 1970-80 birth cohort. For those with middle-status surnames the IGC was rather constant. In contrast, the IGC increased substantially among those with lower-status Swedish surnames, from 0.18 to 0.27. Thus, different social (surname) groups experienced widely divergent mobility trends over the long-term in Sweden.

I further contribute to the literature on mothers' and fathers' respective roles in intergenerational social status mobility. Both maternal and paternal surname-based social status matter, and they matter to an equal extent, for child status attainment. Thus, unlike parental occupational status where historically paternal status is substantially more important than maternal status (e.g. Beller 2009; Goldthorpe 1983), surname status origin is not a gendered status attribute either historically or today. This finding, along with my use of ancestor rather than own surnames makes surname connotation an unlikely mechanism behind the surname premia and surname status persistence observed.

Different mobility levels within surname groups have important methodological as well as substantive implications. In much of the surname status persistence literature, surname dummies are used to capture socioeconomic status of lineages, for example in an instrumental variable approach. The results shown here, where surname status persistence appears to be a group-level process with different levels of parent-child intergenerational mobility within surname groups, suggests that this instrumental variable interpretation of surnames is problematic. As already suggested by Florencia Torche and Alejandro Corvalan (2016), surnames in this case form an endogenous instrument and surname status persistence only sheds light on between-group mobility processes while not capturing within-group intergenerational mobility. Moreover, the strong heterogeneity in surname status persistence – with most of the intergenerational persistence occurring among high-status groups – means that surname status persistence measures cannot be used to capture intergenerational mobility across the full population.

Results presented here indicate that high-status origins from social stratification in a distant past, such as feudalism, may underly some of the heterogeneity in intergenerational mobility also observed in the mobility literature today, and in particular, high intergenerational persistence among high-status groups (cf. other findings in e.g. Adermon et al. 2021; Almenberg and Dreber 2009; Pfeffer and Killewald 2018; Reeves et al. 2017). The high intergenerational persistence in high-status positions originating in pre-industrial and heritable status groupings, rather than for example active parental strategies (or parental strategies originating from such heritable group belonging), has implications for equality of opportunity. That is, as high-status persistence among surname groups is not entirely captured by individual parental social origin, but also comes from group-level processes beyond parental status attainment, 'equality of opportunity' is lower than generally assumed

based on studies of intergenerational mobility, as these group-level traits are entirely heritable. Depending on mechanisms behind this long-term high-status persistence, the result may also be generalizable. If this pre-industrial high-status heritage persisted across as many generations as it appears to do in Sweden (with its low level of income inequality), then similar long-term persistence of subsequently arisen ‘ruling elites’ could be expected. If various kinds of high-status groups are highly persistent intergenerationally, then absolute upward mobility of the entire workforce, or particularly low fertility among high-status groups, become preconditions for those without high-status origin to gain access to high-status positions.

Surname status reflects social origin in a complementary way to parental occupational status and captures higher intergenerational persistence among high-status groups. When abstracting from surname status persistence and only addressing intergenerational mobility at the individual level using occupational status, important components of inequality of opportunity are therefore missed. The overall trend in intergenerational mobility across 1865-1975 birth cohorts looks different in Sweden when controlling for surname group origin. Individual-level intergenerational mobility decreased. Much of this long-term mobility decline is hidden when not controlling for surname groups by a simultaneous reduction in surname status persistence. As a result, I observe surprisingly constant levels of occupational status mobility over the long term across the full population. *Within* surname groups – i.e. given the name you are born with – parental occupational status becomes increasingly important; from an intergenerational correlation of only ca. 0.23 among the 1865-1875 cohorts to an intergenerational correlation of ca. 0.285 among those with Swedish background born around 1975. This overall difference is substantial at least in comparison to other long-term trends; intergenerational occupational mobility is generally highly stable over the long term.

Mechanisms underlying the substantial surname status persistence of historical high-status surname groups, not captured by the intergenerational transmission of occupational status, deserve the attention of future research. One candidate in explaining such long-run intergenerational persistence beyond parental occupational origins is wealth (cf. Björklund et al. 2012). In Sweden, wealth mattered for occupational status attainment at least before the introduction of comprehensive schooling, and for some groups possibly even afterwards. Sweden is known to have a particularly unequal wealth distribution in international comparison (see e.g. Pfeffer and Waitkus 2021). Wealth inequalities were reduced among cohorts born in the early twentieth century, but have again increased among cohorts born in the second half of the century (Roine and Waldenström 2009). Whether wealth inequalities have the potential to affect intergenerational mobility depends on the importance of wealth in the total economy; if most income does not derive from wealth inheritance, the impact of the intergenerational transmission of

wealth on intergenerational mobility must be limited. As Sweden experienced rapid economic growth during the early twentieth century, wealth inheritance formed a small share of national income in the mid-twentieth century. The potential importance of wealth inheritance was higher in the late nineteenth century, and again from the 1990s (Ohlsson, Roine, and Waldenström 2020). Other research finds wealth to form a complementary indicator explaining social status attainment in Sweden, even after controlling for occupation, income and education (e.g. Adermon et al. 2021; Hällsten and Thaning 2022).

However, surname status groups are theoretically as empirically likely to capture somewhat different aspects of social status as does wealth. Theoretically, they reflect status rather than class (cf. Weber). Empirically, noble heritage is for example exchanged for wealth on the Swedish marriage market (Almenberg and Dreber 2009). And even if there exists substantial intergenerational transmission of wealth, wealth is per definition a less persistent status indicator than surname status origin - which is constant between generations. Moreover, high-status surname groups maintained some of their advantaged status position in Swedish society even during a period when wealth was relatively inconsequential for opportunities.

Another possible underlying source for surname status persistence emerges when assessing the importance of surname group fixed effects in intergenerational mobility trends. A significant proportion of occupational persistence can be explained by surname groups for cohorts born until around 1945, but occupational persistence within surname groups equals persistence in the full population for cohorts born after ca. 1950. The reduced importance of surname groups occurs simultaneously with the introduction of comprehensive schooling. Thus, the largely distinct school trajectories existing for the broader elite (*läroverk*, with *realskola* and *gymnasium*) and the rest of the population (*folkskola*) before this time might in part drive surname status persistence (cf. the discussion of Swedish comprehensive schooling in Börjesson et al. 2015; Börjesson and Broady 2016). Surname status persistence may reflect group-level intergenerational persistence occurring at the school (type) level. Previous research has indeed found negative income effects of the Swedish comprehensive school reform among those from high-status backgrounds (Holmlund 2008; Meghir and Palme 2005). The comprehensive schooling reforms of the 1950s and 1960s have to some extent been reversed as schooling trajectories have again diversified in Sweden since the 1990s (Börjesson and Broady 2016; Lundahl et al. 2013; Wennström 2020). It is not yet clear what effect these recent changes have on intergenerational mobility (see e.g. Fjellman, Yang Hansen, and Beach 2019; Trumberg and Urban 2021), but given the historical experience of surname status persistence, they might increase inequality of opportunity.

Relatedly, surname status persistence may reflect geographical differences and ‘neighborhood effects’ in intergenerational mobility. Intergenerational persistence

at the neighborhood level has recently received much attention in the mobility literature (Chetty et al. 2014; Chetty and Hendren 2018a, 2018b). It is one form of group-level persistence, such as ethnic persistence and surname status persistence (cf. Güell, Rodríguez Mora, et al. 2018a). To the extent that different surname groups are clustered in different geographical areas, neighborhood and surname persistence can overlap. This is historically the case with those with lower-status (patronymic) names being concentrated in the countryside and those with middle-status (geographic) names in urban areas.¹⁴³ There also exist distinct elite neighborhoods in Sweden (see e.g. Holmqvist 2017), in which high-status surname groups are likely to concentrate. These geographical communities might in turn shape distinct social and peer networks, children from these neighborhoods will cluster in local schools, and together these factors shape expectations of, and actual, life chances.

¹⁴³ Surname status inequality between these groups is reduced but not eliminated among historical cohorts when controlling for urbanicity and geographical differences, see Dalman, Eriksson, and Dribe 2022.

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Appendix

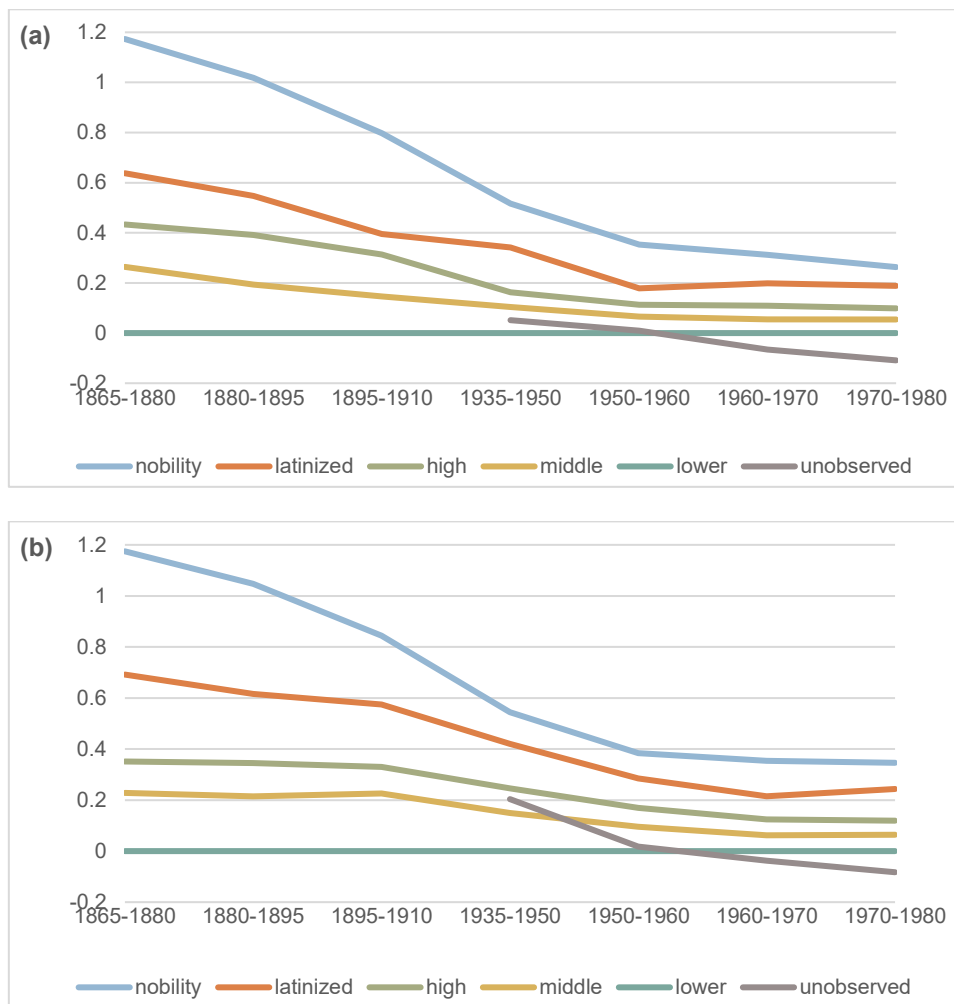


Figure A.1 gross surname premia by parental gender for each cohort, expected standard deviations increase in child occupational status (HISCAM) between a given surname group and lower-status (patronymic) surnames: (a) mother surname premia, (b) father surname premia

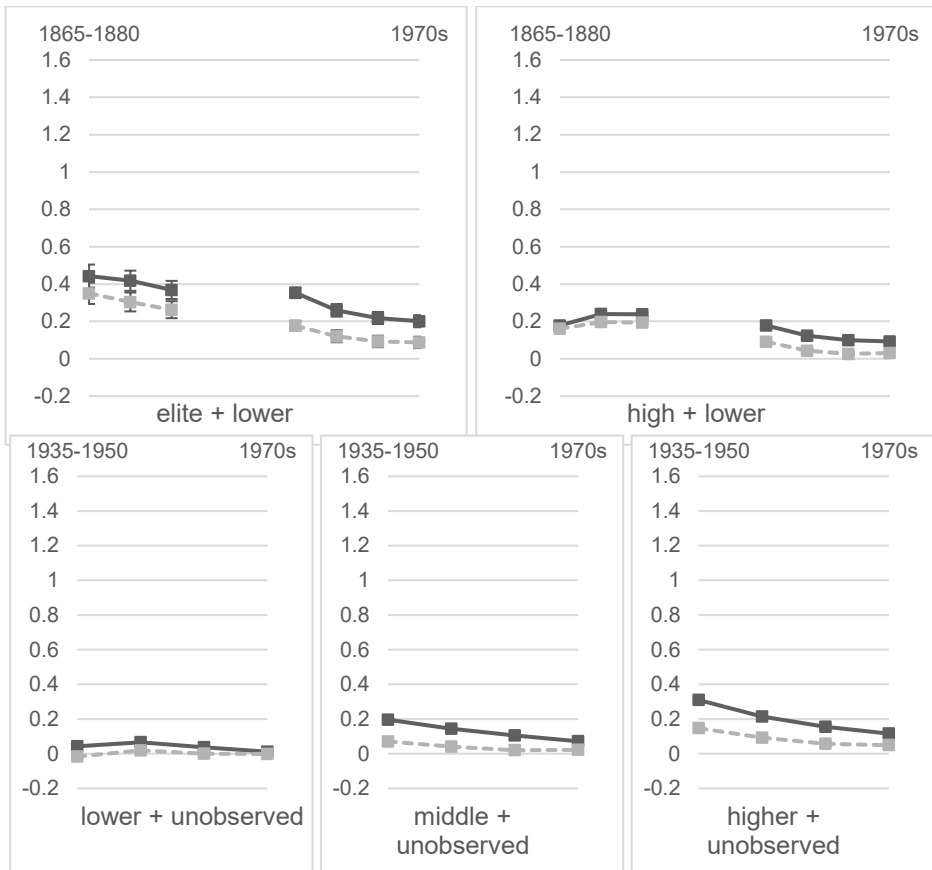


Figure A.2 surname premia, those parental surname combinations excluded from figure 5. Each line marks the surname premia for a specific parental surname group, as labeled. Solid lines show 'gross' surname premia, not controlled for parental occupational status. Dashed lines below each solid line show respective 'net' surname premia, controlled for parental occupational status (average of both parents, or fathers' if mother is not observed employed).

Table A.1: summary statistics

children	1865-1880 mean/prop. s.d.	1880-1895 mean/prop. s.d.	1895-1910 mean/prop. s.d.	1935-1950 mean/prop. s.d.	1950-1960 mean/prop. s.d.	1960-1970 mean/prop. s.d.	1970-1980 mean/prop. s.d.							
HISCAM	53.01	9.60	55.66	10.87	57.30	11.75	71.99	15.54	72.25	15.50	71.67	14.89	70.71	14.92
HISCAM year	1907.59	4.72	1939.83	17.73	1954.82	7.38	1993.52	14.29	2001.45	13.00	2008.04	9.95	2012.78	4.00
High status	0.14		0.19		0.21		0.27		0.30		0.33		0.34	
Low status	0.48		0.39		0.36		0.13		0.15		0.15		0.16	
Age father at birth	35.23	7.29	35.06	7.84	34.65	7.78	32.88	7.05	31.75	6.97	30.14	6.79	29.63	5.68
Age mother at birth	32.13	6.48	31.74	6.49	31.38	6.62	29.21	6.10	28.33	6.11	26.90	5.85	26.85	4.95
Father HISCAM	52.57	8.06	53.48	8.54	53.72	8.53	62.03	14.22	66.00	15.06	68.79	15.02	71.00	15.13
Mother HISCAM	51.36	3.98	47.83	4.90	40.96	4.47	58.30	8.92	61.85	13.14	66.64	15.27	69.89	15.55
Empl. father (ever)	0.98		1.00		1.00		0.97		1.00		1.00		0.98	
Empl. mother (ever)	0.10		0.20		0.27		0.53		0.92		0.96		0.97	
Empl. father (child)	0.95		0.94		0.99		0.94		0.94		0.92		0.89	
Empl. mother (child)	0.00		0.01		0.01		0.10		0.18		0.42		0.59	
Observations	364,330	471,298	605,423	1,231,734	903,938	887,801	826,492							

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Patterns of Persistence

INTERGENERATIONAL MOBILITY AND SWEDEN'S SOCIAL STRUCTURE 1865-2015

In all times, societies have known social hierarchies and boundaries between individuals and groups with distinct social characteristics. The extent to which such hierarchies and boundaries are consequential for life outcomes and persist over time differs between societies. These changes over generations in the social structure, and the social, economical, and institutional developments that shape them, are the topic of this dissertation. I study social mobility – to what extent occupational status in one generation resembles occupational status in the parental generation. I do this in a changing context of educational attainment and welfare state provisions, as Sweden transitioned from an agricultural to an industrial and later service-based economy. Using longitudinal data based on full-count censuses and modern registers, I study cohorts born in Sweden from 1810 until 1985, and parent-child pairs with children born since 1865.

In contrast to mothers in Sweden today, previous generations of women often did not perform formal work outside of the household, or at least not while being a mother to young children. I explicitly situate social stratification and mobility in this context of changing institutions of family and work. I start by studying the changing social structure of men's and women's work, different empirical representations thereof, and their relationship to this changing context. I demonstrate how changes in the institutions of family and work imply changes in intergenerational mobility, with mothers becoming more and fathers less important. Before the dual-earner family, the father's occupational status represents family origin well. Gender continues to shape intergenerational mobility as the same-sex parent affects child status attainment more than the opposite-sex parent. Parental social origins do not act independently but accumulate to shape children's occupational status attainment.

In two of the papers in this dissertation, I use Swedish pre-industrial social status as reflected by different surname types in conjunction with occupational status to study patterns of persistence in the social structure. I demonstrate that surnames primarily reflect social groups rather than individual lineages. I also show that surname status inequality is very high historically and persists across time, with slow rates of regression to the mean. Surname groups and occupation-based social groups interact to shape patterns of persistence. I demonstrate that, historically, occupational mobility was low for high-status groups, and high for low-status groups, and that these groups converge over time to the mobility levels observed across the population today. I show how mobility patterns differ by social origin also in other ways; historically as well as today, a mother's occupational status matters more at lower social origins, while a father's occupational status matters more at higher social origins.



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