Multidimensional Intergenerational Inequality: Resource and Gender Specificity

Intergenerational transmission of inequality in education, social class, and income attainment using a sibling correlations approach

Max Thaning
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Abstract

This study focuses on intergenerational transmission of socioeconomic resources in multiple dimensions and decomposes the influence of parents’ education, social class, and income in relation to the same outcomes for children as well as the unique impact of mothers and fathers on sons and daughters.

In order to minimize measurement error in parental characteristics and life course bias for children, high quality Swedish administrative register data (spanning over 40 years) is utilized. A sibling correlation approach is employed to establish the net influence of each parental resource, both in general and by parents’ and children’s gender.

The results show that intergenerational inequality is subject to resource specificity. First, same resource transmission implies that the same parental resource as the child outcome matter most in transmission of advantage. In this sense, educational elites foster educational elites, while economic advantage favor children’s own economic status. Second, the intermediate and overlapping socioeconomic field resource, parental social class, explains most of children’s outcomes in education and income suggesting that there is a same field transmission. Parental resources explain little variation in its field opposite (i.e. parental education on child income and parental income on child education).

Finally, whether or not intergenerational inequality is subject to gender specificity is ambiguous, it ranges from negligible to substantial contributions. Mothers’ and fathers’ resources do matter independently over all outcomes, where especially fathers’ income dominate and drives the total influence of parental income. However, the result for the same gender transmission is mixed.

The conclusion is that gender and, especially, resource specificity cannot be neglected without biasing results, confusing time trends, and underestimating the true rate of intergenerational inequality. Intergenerational processes of inequality will be misrepresented in a unidimensional conceptualization of socioeconomic transmission, which will also affect both theoretical understanding and the prospects of policy intervention.

Keywords

Socioeconomic background, social background, social origin, education, social class, income, sibling correlations, resource specificity, gender specificity, intergenerational transmission of inequality, multidimensional inequality.
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Introduction

Transmission of inequality from one generation to the next is a complex process, but it serves as an essential element in structuring society by influencing a multitude of individual as well as collective opportunities and life chances. However, intergenerational inequality is often measured in an unidimensional sense and assessed only through a one variable socioeconomic background proxy, following the characteristic of one of the parents. If not the objective is to describe a one-to-one variable elasticity, this approach misrepresents the influence of socioeconomic background because it neglects the multidimensionality of intergenerational transmission of inequality. In particular, it disregards the importance of resource and gender specificity. This implies that it is also necessary to take into account that inequality in children’s outcomes is multidimensional, meaning that different parental resource have varying impact depending on the (child) outcome in question.

Following the status attainment tradition (Blau and Duncan 1967), this study contributes to the knowledge on intergenerational inequality processes by focusing on the explanatory power of parental resources (class, education, and income) over different (and corresponding) child outcomes. Although a small, but growing, share of the literature focus on multidimensional processes in regard to parental resources, there exists no studies, to my knowledge, with an explicit focus on how multidimensional transmission patterns work over several resources and outcomes.

Adopting a multidimensional perspective on socioeconomic background means that several, and not just one, resources in the family of origin are important in structuring the outcomes of the individual. For instance, occupational attainment and education certainly overlap, but they also contribute with unique information on the intergenerational association (Marks 2011). Decomposing the complexity and multidimensionality of socioeconomic background has turned out to be an emerging research field. There are several examples of studies that attempt to address this issue in regard to children’s education (Bukodi and Goldthorpe 2013; Erikson 2016; Hällsten and Pfeffer 2017; Hällsten and Thaning 2017; Jæger and Holm 2007; Meraviglia and Buis 2015; Vauhkonen et al. 2017), with fewer analyzes focusing on children’s earnings (Mood 2017) and occupational attainment (Erola, Jalonen and Lehti 2016).
It is important to recognize the heterogeneity of resources in intergenerational transmission because of empirical reasons as well. Neglecting this can lead to confusion over divergent findings in the effect and trends of parental socioeconomic status (SES) over various child outcomes (Jæger 2007; Mare 1981).

Resource specificity implies that resources are specific in their nature and cannot be equated to other kinds of socioeconomic resources. First, resource specificity, as an overarching concept, posits a same resource transmission logic, i.e. that parents’ status in a given resource is more important for child attainment in that same particular resource and not as important in relation to another kinds of resource outcomes. For example, what matters most to children’s educational attainment is parental educational attainment, and not class nor income. Second, on a higher level of abstraction, resource specificity is also suggested to work in accordance with a same field transmission pattern (cf. Bourdieu 2010 [1984]). Resources are situated in two separate dimensions, a sociocultural (indicated by education) and an economic (income) field. Social class, however, occupies and intermediate position since it carries both an economic and sociocultural quality and is thus more proximate and similar as a resource to both education and income, in terms of the socioeconomic field division. Since education and income belong to different fields, this perspective suggests that parental social class explain more of child education (because it belongs to both fields) than do parental income and that child income is better predicted by parental class than parental education etcetera.

Gender specificity implies that the gender of the parent and the child matter in intergenerational transmission. The first underlying concept of gender specificity, separate parent transmission, implies that the quality of resource transfer to children (sons and daughters alike) is affected by whether the father or the mother holds the specific resource. In other words, parental influence depends on the gender of the parent, an impact that also can vary over different resources. Omitting this perspective empirically translates to a gender bias or underestimation of the true effect of socioeconomic background, where for example fathers serve as a more or less bad proxy of the maternal influence (Beller 2009; Kalmijn 1994). The second aspect of gender specificity is same gender transmission, suggesting that mothers are more important for daughters and fathers matter more for sons (cf. Boyd 1989).

The contribution of this study is to expand the multidimensional perspective on intergenerational inequality by examining transfer patterns over various child outcomes – along the lines of resource and gender specificity. The advantages of this study include utilizing an exceptionally large dataset spanning over 40 years. A sibling correlations method (cf. Solon et al. 1991) is employed, which is suitable for decomposing the raw influence on child outcomes.
A jackknife approach is then utilized in order to tease out the net explanatory contribution of each component involved in the transfer process. Sibling correlations are estimated in three stratification outcomes: Years of education, entry to the service class and long run income.

In sum, the research questions of this study are:

**Multidimensional socioeconomic background**
- Can socioeconomic background be represented by a single variable or is it of a multidimensional character?

**Resource specificity**
- Is the same parental resource as the child outcome most important in explaining intergenerational transmission (*same resource transmission*)?
- Is resource specificity in part explained by a *same field transmission* pattern:
  - Is a parental resource that belongs to the different field than the child outcome (i.e. parental education and child income vis-à-vis parental income and child education) of minor importance compared to same field transmission?
  - Is parental social class, as the intermediate field resource (i.e. both sociocultural and economic in part), the most important resource, after resource specificity is taken into account?

**Gender specificity**
- Are maternal and paternal resources equally important to children over various resources, or is there a *separate parental transmission* pattern?
- Is gender specificity in part explained by a *same gender transmission* pattern (i.e. mothers’ matter more for daughters and fathers are more important for sons)?

**Theory and Literature Review**

**Decomposing socioeconomic status**
Socioeconomic status (SES) in the family of origin, or socioeconomic background, is a multidimensional concept, which consists of several resources that are controlled by the
parents; a notion acknowledged in several research traditions (Blau and Duncan 1967; Bourdieu 2010 [1984]; Bukodi and Goldthorpe 2013; Meraviglia and Buis 2015). However, in general, the intergenerational transmission process is simplified and limited to a two variable function, where socioeconomic background and child outcomes are given by only one indicator respectively – an approach that only captures a part of the total influence. In contrast, applying a multidimensional perspective expand this narrow conception by introducing three distinct parental resources (education, social class, and income), each in which a mother or father can have different levels of attainment. Furthermore, for the child outcomes, the same three resources are also related to gender, i.e. to sons and daughters. In this sense, a multidimensional perspective uncovers the underlying matrix of transmission possibilities and demonstrates the complexity of the transfer process. In other words, behind the single parental and child proxies there are many underlying and obscured transmission/reception variables and thus transfer relations.

One reason why this simplified approach has become a dominant research practice is because socioeconomic background factors have been thought to be interchangeable (Lazarsfeld 1939). This is because that many SES resources overlap to a certain extent, suggesting that they tap roughly the same underlying phenomenon. However, this unidimensional practice has been criticized by Hauser (1972) and, more recently, by Bukodi and Goldthorpe (2013). Neglecting multidimensionality might in fact be responsible for a large part of the discrepant findings in trends of social mobility and educational inequality, when socioeconomic background resources are used interchangeably and assumed to have more or less identical effects (Jæger 2007; Mare 1981).

**Resource specificity**

**Socioeconomic fields and specific resources**

Blau and Duncan (1967) argued that conditions in the upbringing should be perceived from the viewpoint of the child. The authors claimed that in relation to the child, family resources were fixed and it did not matter whether potential (dis)advantages came as a result of, say, fathers’ education or class. In order to further examine the multidimensional influence socioeconomic background, there is a need to reconsider this assumption.

In the left-central panel of figure 1 educational, occupational, and income attainment of parents are represented as different resources in their own right, each followed by parental capacities and conditions. Nevertheless, starting at a higher level of abstraction, the field
sections of figure 1 gives the broader socioeconomic field that each resource belongs to. The straight lines represent a same resource transmission and the dotted lines mark same field transmission. The two different fields are the socio-cultural and the economic. This conceptual split might in part be originally attributed to Weber (1946), who discriminated between an economic order, concerned with the distribution and usage of economic goods as well as services, and a social order, which entails the distribution of social honor in a society. A parallel theoretical separation is present in the more contemporary work of Bukodi and Goldthorpe (2013) as well. Bourdieu (2010 [1984]: cf. 109-19) also developed the concept of a field duality, where a separation is made between the economic vis-à-vis the cultural capital dimensions. The main idea is that children follow different trajectories depending on whether parents are rich in cultural or economic capital. However, a similar conceptualization of the social space is also featured in the broad idea of a situs dimension (Benoit-Smullyan 1944; Morris and Murphy 1959). Situses capture the horizontal differentiation in relation to a vertical rank order. In this sense, inequality clearly can be assessed in terms of more or less generic socioeconomic status, but the point here is that the horizontal aspect in terms of specific resources and fields do matter.

In sum, being privileged in education, income, in the socio-cultural or the economic field alike puts an individual in the top of the vertical hierarchy, but this perspective must be complemented with situating each resource and field in a horizontal relation to the other field and resources. This horizontal axis thus gives the more or less similarity or proximity of resources and fields to each other.

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Figure 1. The effect of parental SES on children’s outcomes, the figure draws partly on Erola, Jalonen and Lehti (2016:34). Straight lines = same resource transmission; dotted lines = same field transmission.

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1 Weber also argued that there was a third component to the stratification system, i.e. “parties”. However, this part is more related to actual mobilization and change of an existing order.
The economic field is represented by income, while the sociocultural field is given by education. Social class is situated in-between and represents a middle ground, being in part an economic indicator and partly a marker of sociocultural status. Social class, and the capacities and condition(s) it renders, is thus conceptually close or proximate to both the sociocultural and economic fields. Consequently, given the central location of both education and income in respective fields, they are more distant from each other. Below I review each resource in more detail and expand on its relation to the broader fields.

**Parental income** reflects the economic means available by the parent(s) to access material resources. In turn, economic resources can be invested in the socioeconomic attainment of the offspring by virtue of either direct investment, such as reimbursement of tuition fees, or indirect investment, which relates to more general financial aid (Jæger 2007). According to the Investment model, families with greater access to economic resources can provide more support in developing the child, whereas families facing greater economic hardship are more focused on basic and immediate needs (Becker and Tomes 1986; Conger, Conger and Martin 2010). For example, economic measures range from purchasing extracurricular study support, living in neighborhoods with more or less profitable social contacts and high quality schools to having living conditions that reassures a quiet space for recreation and homework. In regard to subsequent life events, these measures translate into insulating the child (both as an adolescent and adult) from economic deprivation during periods of economic hardship or relatively insufficient income. For instance, buying/subsidizing the child’s home and supporting him or her with money for (unexpected) expenses or unpaid internships.

**Parental occupational (social) class** is located in the nexus between the economic and the sociocultural field as it represents both intangible status rewards and also is an indicator of long term economic standing. Social class has been conceptualized by Goldthorpe (2000) as employment contracts on the labor market, which has clear and stable associations with income security, earnings stability and future prospects (Goldthorpe and McKnight 2004). As such it is a measure of long-term economic position on the labor market. However, due to a substantial and increasing economic heterogeneity within the classes (Bihagen 2005; Mood 2017; Savage 2019; Bukodi and Goldthorpe 2013) assessment of social status and the sociocultural field.

On a similar note but from a psychological perspective, the “Family stress model” implies that financial strain translates into parental distress and mental health with a negative impact of child rearing practices, which further is associated with adverse child outcomes (Linver, Brooks-Gunn and Kohen 2002). Note the overlap and similarity of social class with income in terms of the Family stress as well as the Investment model, whereas especially in the case of the former, job loss and thus labor market security is an important aspect in affecting parental mental health.
et al. 2013; Weeden et al. 2007), parental income represent a further fine-tuned factor of economic resources – a notion also covered by the microclass approach (Jonsson et al. 2009).

In addition to serving as an economic proxy, social class can be said to reflect a socio-cultural environment, which the family or the individual is constrained to through class related work roles (Stephens, Markus and Phillips 2014), consumption (Carey and Markus 2016), psychological resources or status (Adler and Rehkopf 2008; Kan et al. 2014), and life chance opportunities (cf. Jonsson et al. 2009). As such, it is an indicator of lifestyle in a broader sense (Weber 1978 [1922]). Importantly, the skills that parents’ obtain through their occupational career, such as managerial, professional and communicative abilities, can be transferred to their children (Faas, Benson and Kaestle 2013; Jonsson et al. 2009). Quite relatedly, value orientations expressed in child-rearing practices suggest middle class parents are inclined to value self-direction, whereas working class parents tend to transmit conformity ideals, a mechanism that reinforces occupational transmission (Kohn 1969). As such there are conflicting middle class norms of independence (creativity, self-expression and experimenting with strategies) vis-à-vis a working class culture of interdependence, incorporating cooperation and discipline (Stephens, Markus and Phillips 2014). Differences in values and norms translates into a discrepancy in intergenerational transfers of capacities, dispositions and skills. Furthermore, when other aspects of education and income are controlled for, social class can serve as a more distinct proxy of resources available through social networks accessed through working life (cf. Andersson, Edling and Rydgren 2017; Jæger 2007). Hence, social class (i.e. the net effects when parental income and education are accounted for) is argued to be a factor of occupation related skills and capacities, but also a proxy of social standing, potential networks and resources in the occupational social environment.

_Parental education_ is considered as the main resource of the socio-cultural field. Central to this perspective is the fostering of academic skills, where disadvantaged children are less exposed to learning materials and experiences that foster intellectual and cognitive development (Bradley and Corwyn 2002). In this sense, parental education can be viewed as human capital (Becker and Tomes 1986). However, parental education is sometimes referred to as or likened to the broader category of cultural capital, which is elaborated by Bourdieu (2010 [1984]) as well as in Bourdieu and Passeron (1977).\(^5\) Having parents with higher educational qualifications most often implies a familiarity with education and culture, which certainly encourages and facilitates academic studies but also the adaptation to the (more profitable) middle class social

\(^5\) _A recent attempts to clarify this aspect of Bourdieu’s theory is presented by Jæger and Breen (2016)._
environment. In practice this can be thought of as or related to positive vis-à-vis negative social behavior (popularity, compliant versus deviant conduct), which has a considerable association with family background and mediates the relationship to the child’s own educational attainment (Dubow et al. 2006). Nevertheless, De Graaf, De Graaf and Kraaykamp (2000) find that it is not parental participation with ‘highbrow’ or fine arts that lead to academic success, but the reading behavior – much related to the development of analytical and cognitive skills (strongly structured by parents human capital) – which in turn is transferred to the offspring.

Educational attainment, cultural skills or cultural capital can be transmitted to the individual by means of concerted child-care (Lareau 2011) and more time spent with children (Sayer, Gauthier and Furstenberg 2004). Additionally, potential mechanisms include engagement in school activities, knowledge of the academic system, encouragement of further studies, familiarity with norms and institutional knowledge, to be utilized both in school and in subsequent labor market careers (Ball 2003). Also, family expectation of educational attainment partially establishes a mediating link between family resources and children’s educational outcomes (Faas, Benson and Kaestle 2013).

**Same resource transmission and same field transmission**

The term resource specificity partly draw on the idea of asset specificity in transaction cost economics (cf. Williamson 1981). The concept of asset specificity implies that investments can be particular, or specific, to a given transaction – where transaction in the present case gives the relationship between a parental resource and child outcome. From this follows that if investments are transferred or converted to another kind of transaction (i.e. parental resource in relation to child outcome), there can be transaction or sunk costs. I use the same type of reasoning to organize the different arguments about intergenerational transmissions.

**Same resource transmission (SRT)** as a form of resource specificity implies that intergenerational transfers are strongest within the same resource. For instance, parental education explain most of children’s outcome in education, while parental class is the main predictor of children’s class attainment etcetera. Accordingly, SRT can also be viewed from a rational action perspective (cf. Breen and Goldthorpe 1997). In this sense, the family composition of resources affects the constraints as well as the opportunities that families face in status attainment. Therefore it influences the cost and benefit analysis of pursuing a particular child status attainment in a specific resource. Given that status attainment in itself is more or less preferable or similar over the different resources, parental advantage in a given resource
serves as basis for a (rational) consideration to pursue status attainment in that same resource – simply because it is the most optimal choice given the context.

However, norms and relative valuations of different resources might also affect these considerations (and is most probably correlated with advantage in a particular resource). For example, a family rich in economic resources might see economic affluence as a goal in itself (compared to pursuing higher education as an intrinsic goal or occupation related to an educational advantage). In this sense, SRT also relates to Bourdieu’s reproduction thesis:

“The fractions richest in cultural capital do in fact tend to invest in their children’s education as well as in the cultural practices likely to maintain and increase their specific rarity; the fractions richest in economic capital set aside cultural and educational investments in favor of economic investments (…)”. (Bourdieu 2010 [1984]:116)

A dissimilar transmission, i.e. investing in children’s educational attainment by means of parental income, is associated with severe transaction costs since it involves a resource conversion. In other words, knowledge, information, norms and behavior reflected by parental income are suboptimal in supporting the child in educational attainment. This is because the educational resource requires other forms of knowledge, information, norms, and behavior, which the parent cannot supply through the income resource or capacities related to it. In sum, SRT is based on the notion that the mechanisms and assets of a particular parental resource are best utilized in the same child resource, i.e. the corresponding child outcome. SRT is illustrated in figure 2 below.

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Figure 2. Resource specificity. SRT = Same Resource Transmission (light grey); SFT = Same Field Transmission (dark grey).

However, given the similarity of resources by socioeconomic fields (as seen in figure 1), it is further possible that the field closest to the specific parental resource at hand imply a smaller transaction cost compared to the other field. This is labelled same field transmission (SFT) and operates at a higher level of abstraction compared to the detailed SRT process. There are three resources covered in this study and two overarching fields: Education (centrally located in the sociocultural field) and income (the economic field), whereas social class is the only intermediate resource. The bridging position of the latter implies that is has a proximity to both
fields allowing it to function as a more general asset in terms of transactions. Effectively, SFT suggests that parental social class will influence both child education as well as income more than the parental resource belonging to the other field in regard to the child outcome. SFT is also illustrated in figure 3.

The empirical review of previous studies is limited by the fact that the relative explanatory power of the parental resources can only be assessed if studies include the three parental resources under consideration as well as the corresponding three child outcomes. Hence, in order to ensure a rough comparability of estimates both of these criterions must be fulfilled.\(^6\)

However, in one of the earliest studies on multidimensionality in stratification, Hauser (1972) utilizes four socioeconomic background measures\(^7\) and do find a SRT pattern for occupational and income transmission. In the rare cases where all these three parental measures (class, education, and income/earnings) are accounted for and the explanatory power is assessed, Andrade (2016) finds that a detailed measure of social class explains more of the sibling correlations in long-term income, than parental income. Additionally, Erola, Jalonen and Lehti (2016) state that parental education is the single most important variable in predicting children’s occupational attainment. In Sweden, Mood (2017) suggests that parental income accounts for most of the variance in child’s income, compared to parental class and education. Hence, previous research gives a mixed picture of SRT, but at least support the SFT perspective.

**Unidimensional mobility versus status attainment**

The research on intergenerational inequality in class and occupational attainment is mainly divided in two subgroups: Unidimensional mobility studies vis-à-vis status attainment perspectives. The first focuses on mobility in a single variable across generations, for example, mobility between classes, intergenerational income or years of schooling correlations, while the latter focuses on how several variables of origin (parental/childhood/adolescence) and mediating (e.g., child’s education) variables predict subsequent child outcomes.

Since this essay takes a status attainment perspective, the review of the literature on unidimensional mobility is limited. However, it suffices to say that studies on elasticity and mobility find substantial intergenerational correlations in all outcome dimensions, albeit with different magnitudes. For schooling, Sweden is average in the western Europe and US region

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\(^6\) Because of the socioeconomic resource overlap (to be discussed), including only one of the parental resources, or accounting for other aspects of stratification, will change the relative share of variance attributed to a specific parental resource. This results in incomparable measures over different research frameworks.

\(^7\) Father’s education and occupation, mother’s education and parental income.
Intergenerational inequality in education

Swedish is a relatively equal country compared to other developed nations when examining educational attainment in relation to social class origin (Jonsson, Mills and Müller 1996). Class origin effects on educational attainment tend to follow a straightforward pattern, where upper middle class incumbents are more advantaged, while less privileged white collar employees, farmers and workers fall behind in a hierarchical manner (Erikson and Jonsson 1996: 7). Hansen (1997) states that social class origin as well as parental income is important throughout the educational career of Norwegian adolescents. However, the author finds that children with parents in higher grade professional, teacher, administrator and engineer occupations transcend educational transition points to a higher degree than those merely privileged in parental income. Accounting for cognitive ability, Bukodi, Erikson and Goldthorpe (2014) find that for Sweden and Britain, parents’ social class, status and education have independent effects on children’s educational attainment. Furthermore, they state that the association between parental education and individual educational attainment tend to be higher compared to the other social origin variables. This is corroborated by Erikson (2016) in a Swedish context, where parental social class and education display higher associations with children’s educational attainment compared to earnings and social status. Accordingly, in Sweden, parental education and class are more important than income in predicting children’s educational attainment (Erikson and Jonsson 1993: Chapter 7). Furthermore, Hällsten and Thaning (2017) find that Swedish individuals’ educational choices are influenced by several socioeconomic background resources, with parental education generally explaining most of the variance in field of study segregation. In fact, for income, Gregg et al. (2017) find that the association between family income and sons’ educational attainment is fairly similar in Sweden, Britain and the US, where otherwise Sweden generally stands out as a more egalitarian society.

Intergenerational inequality in class and occupational attainment

It has long been established that the occupational attainment of individuals are influenced by their socioeconomic origin (Blau and Duncan 1967; Erikson and Goldthorpe 1992). In Sweden,
having a working class origin influences the probability of entering the service class negatively (Erikson and Jonsson 1998) and is a stable over time (Bihagen, Nermo and Stern 2012). Moreover, Ballarino and Bernardi (2016) show that there is a direct effect of parents’ occupational attainment (net of extensive controls for education) on that of their children in all fourteen countries they examined.

Recent studies of the multidimensional influence of socioeconomic background find that parental education matter for children’s occupational outcomes. Erola, Jalonen and Lehti (2016) show that parental education is the single most important predictor of the occupational attainment of children, followed by parental occupation, while family income matters the least. Similarly, Gugushvili, Bukodi and Goldthorpe (2017) also observe that parental education has an independent (and even stronger) influence on the probability of entering the salariat, over and above parental class.

**Intergenerational inequality in earnings and income**

Several studies find a wage penalty for individuals with less privileged class backgrounds, suggesting that origin influences earnings over and above similar working conditions and qualifications (Bernardi 2012; Erikson and Jonsson 1998; Laurison and Friedman 2016). In a Norwegian context, class origin directly correlate with level of economic reward, after accounting for educational attainment and children’s field of study, although the social origin penalty is different between fields (Hansen 2001). Turning to Sweden, Hällsten (2013) reports that the class origin wage gap (i.e. between individuals with upper service vs. unskilled working class background) is found to be between 4 and 5 percent, even when highly detailed fields of study are accounted for.

Mood (2017) finds that parental class, income and education each explain about a third of the variance in children’s earnings, but parental income is slightly more important than the other variables. Mood (2017) further states that accounting for mixed class backgrounds (i.e. utilizing information on both parents and collapsing into detailed categories) shows an even more fine-grained pattern in structuring the earnings of children hierarchically.

**Gender specificity**

Gender specificity means that gender is an important aspect in the transmission process, it highlights parental gender, children’s gender and the combination between them. It is suggested that the mother’s and father’s level of attainment in regard to different resources matter
separately and that children’s attainment is related to its own and the transmitting parent’s gender. Below I expand on the two sub concepts of gender specificity.

**Separate parental transmission**

One aspect of gender specificity is *separate parental transmission* (SPT). This concept implies that mothers and fathers can transmit resources to children independently of each other. In other words, just using an indicator of father’s SES is not necessarily a good proxy of the mother’s resources. Similarly, mother’s resources might be more important in certain outcomes compared to the father’s status, and vice versa. SPT is illustrated in figure 4, suggesting a distinct transmission process for either the maternal or the paternal resource.

Since the traditional way of operationalizing social background (or social class origin) has been to either utilize information on fathers’ position (cf. Goldthorpe 1983; Watson and Barth 1964) or the dominant (Erikson 1984) position in the household, I will review the importance of maternal resource.

There are two major reasons why maternal resources are important in status attainment research. First, the criticism against the traditional perspective argue that it neglects female experiences on a general level, both in terms of in resources and outcomes in social stratification research (Acker 1973; Sorensen 1994). The second reason to why maternal resources matter is that estimates of intergenerational transmission of inequality are biased when not accounting for both parents (Hansen 2010), meaning that traditional practices can conceal particular transmission patterns and time trends (Beller 2009). Especially increased female labor force participation points to the necessity of analyzing mothers and daughters in addition to fathers and sons (Kalmijn 1994). For earnings outcomes, Mood (2017) reports that Swedish mothers’ and fathers’ social class is important in its own right. Similarly, in occupational outcomes, individual contributions of each parents’ occupational status are superior in predicting children’s attainment (Meraviglia and Ganzeboom 2008). Regarding inequality in children’s education, Kalmijn (1994) as well as Korupp, Ganzeboom and Van Der Lippe (2002) highlight the significance of mothers’ socioeconomic resources in regard to children’s educational achievement. Buis (2012) implies a similar contribution between mothers’ and fathers’ occupational attainment in children’s schooling.

However, there are opposite findings suggesting that maternal educational attainment has a negative or indifferent relationship with children’s educational attainment, presumably this can be explained by the amount of time spent with children which can be reduced (Behrman and Rosenzweig 2002; Plug 2004). In a Swedish context, maternal prebirth (genetic) factors are
reported to be more important than postbirth causes in influencing children’s educational attainment (Björklund, Lindahl and Plug 2006). Black, Devereux and Salvanes (2005) do not find any causal effect of education in Norway, except for the relationship between mother’s education on son’s educational attainment. It could be that unobserved factors that are associated with mothers’ schooling (e.g., child rearing, cognitive or non-cognitive ability as well as behavior) inflates the correlation between parent’s and children’s educational attainment (Holmlund, Lindahl and Plug 2011). This does not mean that mother’s education should be neglected in intergenerational outcomes, it is just that the causal effect of formal education in itself for mothers is questioned, e.g., compared to maternal ability in general (Marks 2008).

### Same gender transmission

The second aspect of gender specificity is *same gender transmission* (SGT), implying that parents and children having the same gender experience a mutual gender based identification and similarity which strengthen the intergenerational transfer to the child, in comparison to a parent of a different sex. SGT is illustrated in table 4. The concept builds on a gender role modeling perspective, where gender is learned by normative means, reinforcement and imitation from the family as well as from the rest of the child’s context (Boyd 1989; Huttunen 1992; Raley and Bianchi 2006). From the child’s point of view, the mother and the father constitute the first exposure to the meaning of gender identity (Witt 1997). Whereas daughters identify to a larger extent with mothers, sons look up more to their fathers (Starrels 1994). The conclusion is that resources attained by the parent having the same gender as the child should matter more.

However, the relationship might not be that straightforward, it has been suggested that the importance of mothers’ influence on daughters increase with higher education (Acock and Yang 1984; Smith and Self 1980; Tangri 1972). In other words, the less dominated the mother is in the family, the more crucial is her influence. This result connects with McDonald’s (1977) power model (children orient themselves in regard to the most powerful of the parents) and Erikson’s (1984) social class dominance principle.⁸

Parents rarely state that they have different preferences for their children in regard to gender (Raley and Bianchi 2006). Nevertheless, Baker and Milligan (2016) show that investments are equally distributed when children are very small, but start to diverge a couple

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⁸ *Korupp, Ganzeboom and Van Der Lippe (2002) also suggest that a modified (genderless) dominance approach, utilizing the information of the non-dominant parent as well, is the best empirical solution for intergenerational transmission of inequality in education. See also Thaning and Hällsten (2018).*
of years later, where fathers allocate significantly more time to sons (while no such effect is found for mothers). Dahl and Moretti (2008) also report that father’s generally favor boys in relation to girls.

The previous literature is inconclusive on SGT. The inconsistency might partly reflect different focus on outcomes and socioeconomic resources. Examining children’s schooling, several studies have found similar influence for mothers’ and fathers’ education as well as occupation regardless of children’s gender (Buis 2012; Kalmijn 1994; Korupp, Ganzeboom and Van Der Lippe 2002). However, in a country comparative assessment of children’s educational status, Tomescu-Dubrow and Domański (2010) report that mothers’ educational attainment matter more for daughters, in contrast to the general smaller influence of fathers on sons. On the other hand, Dryler (1998) found that the influence of parents’ field of study on children’s educational choices was limited to father-sons and not mother-daughters. For transmission of occupational status, studies find support for the same gender advantage pattern (Korupp, Sanders and Ganzeboom 2002; Meraviglia and Ganzeboom 2008). However, Crook (1995) reports that the parents matter to the same extent regardless of children’s sex in terms of occupational transfer.

In sum, there are no clear expectations coming from the literature in regard to SGT. There are results pointing in both directions, with inconsistencies over outcomes and specific gender compositions.

![Figure 4. Gender specificity. SPT\textsubscript{m} = Separate parental transmission, mothers (light grey); SPT\textsubscript{f} = Separate parental transmission, fathers (medium grey); SGT = Same gender transmission (dark grey).](image)

**Differences in outcomes for sons and daughters**

The sex of the recipient of a status transmission is important, not least because gender in itself is strongly structuring educational and labor market careers. But sons and daughters also get different kinds of help in regard to parental involvement in children’s education, although girls are generally more aided than boys (Carter and Wojtkiewicz 2000). Particularly, parents read
and teach letters to a higher extent with their daughters (Baker and Milligan 2016). Moreover, the peer school culture of girls is more study-oriented than the corresponding culture for boys (Houtte 2004). On the other hand, parent’s do financially support son’s education to a larger extent than daughter’s (Raley and Bianchi 2006).

Nevertheless, sister and brother correlations in education are roughly similar over Norwegian cohorts born 1932 to 1968 (Björklund and Salvanes 2011:205-07). However, sister correlations in earnings are somewhat weaker than brother associations (cf. Björklund and Jäntti 2012). According to Breen, Mood and Jonsson (2016), intergenerational correlations in income mobility are about 0.1 to .05 units weaker for daughters compared to sons. Conley and Glauber (2008) report that sibling correlations are similar over sex compositions in education, income, and family income.

**Nature and nurture**

Although genetics is left out of this analysis, I will briefly complement the focus on environmental factors by addressing some recent findings that examines genetic components that are of importance in social outcomes (Conley, Fletcher and Dawes 2014). The results coming from the literature on educational attainment focused on assessing genetic impact is mixed. On the one hand, studies utilizing twin and adoption information have estimated the effect of heritability to be quite on par with the influence of nurture (i.e. about 50% each), with some variations between mothers’ and fathers’ pre- and postbirth contributions (cf. Björklund, Lindahl and Plug 2006). There also seem to be variation between the social and biological transmission of different socioeconomic resources, with parental education being more important for biologically related families, while parental income effects were similar between adoptees and biological children (Scheeren, Das and Liefbroer 2017). However, a problem with these studies is that they use proxies for genetics (which might contain other non-genetic information that covary with the outcome) instead of directly measuring genotypes (Conley 2016).

Using genome data, Conley et al. (2015) report that genetic heritability accounts for roughly one sixth of the raw correlation between mother and child educational attainment, the rest is attributed to environment. Liu (2018) instead finds that that genetic contribution is slightly higher, i.e. one fifth of the total transmission. Explaining this in more substantive terms, Conley et al. (2015) argue that individuals are subject to a two level system of ascription: First,
by a random draw of genetic inheritance within the family (which might be strengthened by sibling niche formation) and; second, by social heritability between families.

Finally, genetic heritability is higher in more affluent SES environments and lower in impoverished milieus (Turkheimer et al. 2003), which might also be suggested by estimates of lower sibling correlations for individuals coming from a disadvantaged family social background, compared to children of privileged families (Conley and Glauber 2008). Hence, the transmission and advancement of innate biological abilities are conditioned on the social environment (cf. Heckman and Mosso 2014). In other words, genes are only allowed to express themselves fully in prosperous environments.

In sum, the confounding effect of genetics (on educational attainment) are significant but not critical – the process still is dominated by environmental influences. Moreover, since the direct study of genetic heritability is a bourgeoning field that is developing rapidly, the results should be carefully interpreted.

**Concluding remarks**

Theory and some previous research suggest that intergenerational transmission is multidimensional, and that different patterns in this multidimensionality can be explained by resource and gender specificity. The first aspect of resource specificity is *same resource transmission*, which implies that investment in the same child outcome as the parental resource is the most important. Second, since resources are more or less proximate, they can be clustered into socioeconomic fields in regard to their qualitative features. *Same field transmission* denotes that a parental resource in the same field as the child outcome is more influential than a parental resource from the other field. Social class is an intermediate field resource and thus constitute a more general asset.

Gender specificity is divided in *separate parent transmission*, which posits that transfers to children differ if it is the mother or the father that hold the resource, and, also into *same gender transmission*, where transfers are facilitated along gender lines (father to son and mother to daughter premiums).
Data

This study uses Swedish register data and the population is delimited to children born between 1955 and 1972. Since data is available to 2012, children are observed up until they are between 40 and 57 years old, meaning that they are in their mid to late labor market careers. Parents are matched with children through the Multigenerational register, which is based on individual birth records. Parental characteristics are recorded for fixed periods of time and are thus not sensitive to any specific age of children. The prime interest in the data construction is to utilize long periods of information and averaging characteristics in order to reduce measurement error. Only individuals for whom data (on all the variables) for both the mother and the father is available are retained.

Children’s education is obtained from the educational registers, it is collected from 1990 and onwards, using the highest attained educational level. The educational level is then recoded into years of education, which vary from six years of primary school attainment to a doctor’s degree (19 years).

Parental education is collected from the 1990 census and cover the same range as for children. Hence, a further inclusion requirement is that parents survive up until at least 1990 in order to obtain an educational status in the data.

Children’s social class is based on the employer reported occupational register between 2001 and 2012. The national occupational classification code (SSYK) is used for each individual and cross-classified with industry information, which in turn corresponds to a modal Socioekonomisk Indelning, SEI, (SCB 1982) category. The modal SEI categories are calculated from information on occupation and industry in the census of 1990. SEI is then translated to Erikson-Goldthorpe-Portocarero (EGP) classes (Erikson and Goldthorpe 1992) and the highest attained category under this period is used as the value of the binary variable, entry into the salariat (i.e. the first and second class).

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9 Minimizing measurement error in the independent variable is critical in this kind of decomposition study. If there are problems with error in any parental variable, the other parental variables will pick up the variation and thus distort the distribution of how the different variables contribute to predict the outcome (Mood 2017). Moreover, Erola, Jalonen and Lehti (2016) show that the potential life course bias, i.e. when parental information is obtained in regard to a specific age of the child, is likely to be a minor problem.

10 The number of missing cases in occupations range from 15.4 percent in 2001 to 4.7 percent in 2012. The occupational register is of lowest quality in the earliest year (2001), but increasingly cover the working population better and better. Hence, the best approach is to utilize information over the whole period, starting from 2012 and subsequently complementing missing information by going back a year at the time.

11 See also Tåhlin (2007).
**Parental social class** is obtained from the Swedish censuses, conducted between 1970 and 1990, with five year intervals. The information of parental class is based on self-reports. I utilize the highest attained level up until 1990. If there is missing data on any of the later time periods, the highest value prior to that is used. Hence, information from all the censuses is utilized in order to minimize missing cases. Since intragenerational mobility among adults is relatively low (Jonsson 2001), this should not pose any significant problems to the analysis.

**Child income** is collected from the Income and taxation database (IoT), which includes annual records ranging from 1968 and onwards. In order to minimize the risk for life-cycle bias, all available information on income for each individual is used and recalculated to mean values. Income here refers to disposable income, meaning that it is the sum left after tax deductions and government transfers. Income is adjusted to 2003 prices.

For **parental income** the source data and income concept is the same as for children. This means that it cover most of the parent’s active labor market years (from at least mid to end of the individual income careers), coming close to a concept of lifetime or permanent income. This is clearly an advantage since measurement error is a crucial problem when it is present in independent variables (cf. Wooldridge 2009).

Summary descriptive statistics are presented in table 1.

**Table 1.** Descriptive statistics.

<table>
<thead>
<tr>
<th></th>
<th>Mixed</th>
<th>Sisters</th>
<th>Brothers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individuals</td>
<td>878095</td>
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</tr>
<tr>
<td>Families</td>
<td>451131</td>
<td>338010</td>
<td>347153</td>
</tr>
<tr>
<td>Family size</td>
<td>2.44</td>
<td>2.48</td>
<td>2.48</td>
</tr>
<tr>
<td>Birth year</td>
<td>1964.26</td>
<td>1964.18</td>
<td>1964.24</td>
</tr>
<tr>
<td>Years of education</td>
<td>12.46</td>
<td>12.74</td>
<td>12.17</td>
</tr>
<tr>
<td>Service class (%)</td>
<td>0.55</td>
<td>0.57</td>
<td>0.53</td>
</tr>
<tr>
<td>Income average (ln)</td>
<td>4.90</td>
<td>4.80</td>
<td>4.99</td>
</tr>
<tr>
<td>Mothers' education</td>
<td>9.79</td>
<td>9.74</td>
<td>9.75</td>
</tr>
<tr>
<td>Fathers' education</td>
<td>9.81</td>
<td>9.77</td>
<td>9.78</td>
</tr>
<tr>
<td>Mothers' service class (%)</td>
<td>0.22</td>
<td>0.21</td>
<td>0.22</td>
</tr>
<tr>
<td>Fathers' service class (%)</td>
<td>0.33</td>
<td>0.33</td>
<td>0.33</td>
</tr>
<tr>
<td>Mothers' income average (ln)</td>
<td>4.53</td>
<td>4.53</td>
<td>4.53</td>
</tr>
<tr>
<td>Fathers' income average (ln)</td>
<td>5.04</td>
<td>5.04</td>
<td>5.04</td>
</tr>
<tr>
<td>Mothers' birth year</td>
<td>1938.18</td>
<td>1938.04</td>
<td>1938.08</td>
</tr>
<tr>
<td>Fathers' birth year</td>
<td>1935.20</td>
<td>1935.04</td>
<td>1935.08</td>
</tr>
</tbody>
</table>
Methods

The case for sibling correlations

The virtue of employing a sibling correlations approach is that it captures the parent-child status transmission also in unobservables (Mazumder 2008). For example, this could refer to everything from parental involvement in school to family socioeconomic resources, neighborhood effects and genetic heritability. In other words, sibling correlations can be said to be an omnibus measure of family background because it reflects of the component that is shared between siblings, it thus serves as a benchmark for observable dimensions of intergenerational transmission of inequality. From this benchmark one can evaluate how different aspects of socioeconomic background contribute to explain the similarities in outcome by reducing the correlations.

Analytical strategy

The variance component analysis of sibling correlations is executed as follows, in which outcome (Y) for sibling i and family j is obtained by means of multilevel regression modeling to cluster individuals on a common family identification variable:

\[
Y_{ij} = \beta_0 + \beta X_{ij} + \epsilon_{ij} ,
\]

where \(X_{ij}\) denotes a vector of explanatory variables for individual i from family j. The residual term, \(\epsilon_{ij}\), is comprised of two components\(^{12}\):

\[
\epsilon_{ij} = a_j + b_{ij} .
\]

The first component, \(a_j\), is the shared family part of siblings, while \(b_{ij}\) gives the individual variation. Hence, the variance of the residual term, \(\sigma^2_e\), is the sum of the variances of the family and the individual component:

\(^{12}\text{Note that several studies utilize more limited measures of economic outcomes, such as annual income, which necessitates the use of a transitory error component. In the present case, where the variable is long-run or lifetime income, this is not necessary.}\)
\[
\sigma_e^2 = \sigma_a^2 + \sigma_b^2 .
\]

The share of the individual outcome, \( Y_{ij} \), that is attributed to family background effects can thus be expressed as follows:

\[
\rho = \frac{\sigma_a^2}{\sigma_a^2 + \sigma_b^2},
\]

in which \( \rho \) is equal to the correlation between randomly drawn pairs of siblings, i.e. sibling correlations – in generic terms called intra-class correlations (ICC).

Following Mazumder (2008), the analysis proceeds by changing or adding variables in the \( X_{ij} \) vector of equation (1) to form a new configuration making it possible to evaluate the different models. This process gives a new residual variation and a different estimate of the family variance component, \( \sigma_a^{2*} \). By comparing the respective estimates (\( \sigma_a^2 - \sigma_a^{2*} \)), the difference in explanatory power of the given \( X_i \) model is assessed.

First, I will estimate the gross influence of resource and gender specific transmission by separately and respectively adding a factor to an otherwise empty model. Second, I use a jackknife approach, where a model that includes all parental resources serves as a baseline from which I systematically remove one factor at a time to net out the unique contribution of each component.

The measure of the gross percentage reductions (\( \downarrow \% \)), or contributions as I will refer to them, is acquired by the following procedure: I calculate the baseline correlation, \( ICC_{base} \), and the model specific ICC, \( ICC_{model} \) (including only one factor of interest), and then take the difference between them, divide by the baseline estimate (and multiply by 100 to get percentages):

\[
\downarrow \%_{\text{gross}} = \frac{(ICC_{base} - ICC_{model})}{ICC_{base}} \times 100
\]

The percentage contribution in net correlations is calculated in a similar fashion, but instead I estimate the full model (\( ICC_{full} \), containing all parental variables. I then take the difference in regard to a model that lacks the given variable of interest, \( ICC_{model}^* \), and relate the difference to the baseline in order to generate a comparable estimate:
\[ \downarrow \%_{\text{net}} = \frac{(\text{ICC}_{\text{model}} - \text{ICC}_{\text{full}})}{\text{ICC}_{\text{base}}} \times 100 \]

Hence, the larger the importance of a given factor, the greater the difference in \( \text{ICC}_{\text{model}} - \text{ICC}_{\text{full}} \), which lead to a higher \( \downarrow \%_{\text{net}} \). This is because \( \text{ICC}_{\text{model}} \) lacks the given variable and thus return a higher correlation than the \( \text{ICC}_{\text{full}} \) estimate, which is equal to \( \text{ICC}_{\text{model}} \) plus the contribution of the variable of interest. The interpretation of results will depart from percentage contributions (\( \downarrow \% \)).

Singletons may be included in a sibling correlations framework to increase the precision of the between family variance component (cf. Lindquist et al. 2016). However, the present focus is limited to the ICC and since singletons do not contribute the estimation of ICC and might induce outlier bias, they are dropped (Solon et al. 1991).

**Methodological limitations**

Even though children obtain all of their genetic material from the parents, biological siblings on average only share about 50% of each other’s respective genes (Björklund and Jäntti 2012). Additionally, siblings do not share all of the family and community influences in the upbringing. The position and treatment in the family, and overall childhood environment, might result in different individual experiences that eventually lead to sibling disparities in subsequent outcomes, although it might in part be a function of social background.

Extensions of the original sibling approach have proceeded by utilizing covariance between identical or monozygotic (MZ) twins (cf. Ashenfelter and Rouse 1998; Björklund and Jäntti 2012). These models have been elaborated since twins share even more of both nature and nurture factors in the upbringing as the exposure to both biological and social conditions are almost identical.\(^{13}\)

However, to consider some of the benefits of twin studies, the analysis is limited to closely spaced siblings, who are assumed to at least share more environmental influences and interact to a higher degree than siblings with greater age differences (Eriksson et al. 2016). In other

\(^{13}\) On the other hand, with a twin correlation framework comes a problem of endogeneity, which can be attributed to the notion that twins interact more intensively with each other compared to other siblings. Such an “excessive” interaction might serve as a basis of social and psychological support, generating a shared twin advantage compared to other siblings and singletons (Hjern et al. 2012). In this sense, identical twins can constitute an endogenous feedback loop in themselves, where the outcomes of twins partially can be attributed to the effect of being twins. This caveat makes inference to the general population more troublesome, limiting the scope of external validity (Conley et al. 2015).
words, external validity is higher while the approach still captures a broad measure of shared family background effects.

## Results

### Sibling correlations in educational attainment

The upper section of table 2 gives the baseline and gross correlations when controlling for each resource. To ease the interpretation, I will refer to percent reductions as contributions, since a model with explanatory value equals a reduction in the ICC estimate, which means that it contributes to explain the sibling similarity. Parent’s resources include both mother and father indicators for each resource. All models control for birth year in order to account for cohort effects.

### Table 2. Sibling correlations in years of education, resource specificity.

<table>
<thead>
<tr>
<th></th>
<th>Mixed</th>
<th></th>
<th></th>
<th>Sisters</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th>Brothers</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ICC</td>
<td>s.e.</td>
<td>↓%</td>
<td>ICC</td>
<td>s.e.</td>
<td>↓%</td>
<td>ICC</td>
<td>s.e.</td>
<td>↓%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Gross correlations</strong></td>
<td></td>
<td></td>
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<td></td>
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<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Baseline</td>
<td>0.384</td>
<td>0.001</td>
<td>–</td>
<td>0.389</td>
<td>0.002</td>
<td>–</td>
<td>0.447</td>
<td>0.002</td>
<td>–</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Edu&lt;sub&gt;parents&lt;/sub&gt;</td>
<td>0.269</td>
<td>0.001</td>
<td>30.0</td>
<td>0.291</td>
<td>0.003</td>
<td>25.1</td>
<td>0.320</td>
<td>0.002</td>
<td>28.4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Class&lt;sub&gt;parents&lt;/sub&gt;</td>
<td>0.284</td>
<td>0.001</td>
<td>26.2</td>
<td>0.302</td>
<td>0.003</td>
<td>22.4</td>
<td>0.337</td>
<td>0.002</td>
<td>24.6</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inc&lt;sub&gt;parents&lt;/sub&gt;</td>
<td>0.335</td>
<td>0.001</td>
<td>12.9</td>
<td>0.350</td>
<td>0.002</td>
<td>9.9</td>
<td>0.388</td>
<td>0.002</td>
<td>13.1</td>
<td></td>
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</tr>
<tr>
<td><strong>Net correlations</strong></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Full model</td>
<td>0.247</td>
<td>0.001</td>
<td>–</td>
<td>0.272</td>
<td>0.003</td>
<td>–</td>
<td>0.295</td>
<td>0.002</td>
<td>–</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Edu&lt;sub&gt;parents&lt;/sub&gt;</td>
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<td>0.001</td>
<td>7.1</td>
<td>0.295</td>
<td>0.003</td>
<td>6.0</td>
<td>0.325</td>
<td>0.002</td>
<td>6.9</td>
<td></td>
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</tr>
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<td>Class&lt;sub&gt;parents&lt;/sub&gt;</td>
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<td>3.5</td>
<td>0.308</td>
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</tr>
<tr>
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<td>0.003</td>
<td>1.0</td>
<td>0.301</td>
<td>0.002</td>
<td>1.4</td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

In table 2, the benchmark sibling similarities in years of education are about .38 to .39 for mixed and sister siblings, while they are higher, roughly .45, for brothers. This suggest that brothers are more similar than sisters in their educational attainment. Parental education and class contribute respectively with between 26 and 30 percent in explaining the gross correlation in education, while parent’s income matter less (10 to 13 percent). At a first glance, the considerable difference between the resource estimates for both gross and net correlations suggest that using only one of these resources as proxy for the total impact of social origin fail...
to capture full extent of the inequality process. Although parental income is measured better than in most studies, it clearly is a suboptimal indicator for social origin in regard to children’s education. For example, the gross contribution of parental income is lower than half of parent’s education, while the influence of parent’s education and social class are more similar.

Table 3. Sibling correlations in years of education, gender specificity.

<table>
<thead>
<tr>
<th></th>
<th>Mixed</th>
<th></th>
<th>%</th>
<th>Sisters</th>
<th></th>
<th>%</th>
<th>Brothers</th>
<th></th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ICC</td>
<td>s.e.</td>
<td>↓%</td>
<td>ICC</td>
<td>s.e.</td>
<td>↓%</td>
<td>ICC</td>
<td>s.e.</td>
<td>↓%</td>
</tr>
<tr>
<td>Gross correlations</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baseline</td>
<td>0.384</td>
<td>0.001</td>
<td>_</td>
<td>0.389</td>
<td>0.002</td>
<td>_</td>
<td>0.447</td>
<td>0.002</td>
<td>_</td>
</tr>
<tr>
<td>Edu\textsubscript{mother}</td>
<td>0.306</td>
<td>0.001</td>
<td>20.4</td>
<td>0.316</td>
<td>0.003</td>
<td>18.7</td>
<td>0.367</td>
<td>0.002</td>
<td>17.8</td>
</tr>
<tr>
<td>Edu\textsubscript{father}</td>
<td>0.300</td>
<td>0.001</td>
<td>22.1</td>
<td>0.322</td>
<td>0.002</td>
<td>17.3</td>
<td>0.348</td>
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<td>0.378</td>
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<tr>
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Net correlations

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<th></th>
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<th></th>
<th>%</th>
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</thead>
<tbody>
<tr>
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<td>_</td>
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<td>0.003</td>
<td>_</td>
<td>0.295</td>
<td>0.002</td>
<td>_</td>
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<tr>
<td>Edu\textsubscript{father}</td>
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<td>2.6</td>
<td>0.278</td>
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<td>1.6</td>
<td>0.309</td>
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</tr>
<tr>
<td>Class\textsubscript{mother}</td>
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<td>0.278</td>
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<td>1.6</td>
<td>0.301</td>
<td>0.002</td>
<td>1.4</td>
</tr>
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<td>Class\textsubscript{father}</td>
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<td>1.2</td>
<td>0.300</td>
<td>0.002</td>
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</tr>
<tr>
<td>Inc\textsubscript{mother}</td>
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<td>0.1</td>
<td>0.272</td>
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<td>0.1</td>
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<td>1.2</td>
<td>0.275</td>
<td>0.003</td>
<td>0.9</td>
<td>0.301</td>
<td>0.002</td>
<td>1.3</td>
</tr>
</tbody>
</table>

The lower section of table 2 refers to the net contributions of each resource. The full model estimate shows the ICC when all resources are controlled for. However, I will avoid interpreting this estimate since it is only used in order to assess the unique contribution of each resource. The ICC for parental education thus gives the estimate for a model containing all variables except parental education. The difference between this estimate and the full model ICC (divided by the baseline correlation) gives the unique contribution of the given variable. Parental education is clearly the most important resource for children’s years of education meaning that there is support for same resource transmission.\textsuperscript{14} The contribution of parent’s

\textsuperscript{14} I do not display any significance tests because the standard errors are marginal and statistical power is substantial. To exemplify, consider a two-sided t-test: \(\frac{\hat{\beta}_i - \hat{\beta}_j}{\sqrt{(S.E.\hat{\beta}_i)^2 + (S.E.\hat{\beta}_j)^2 - 2\text{cov}(\hat{\beta}_i, \hat{\beta}_j)}}\). The \(-2\text{cov}(\hat{\beta}_i, \hat{\beta}_j)\) term is hard to estimate with standard methods and therefore omitted. However, this covariance term is always positive, which makes the test more conservative since this term shrinks the denominator and
education ranges from between 6 to 7 percent, while the second most important resource, parental social class, explains about 3 to 3.5 percent. The influence of parental income is more marginal (between 1 to 1.4 percent). The low explanatory power of parental income for children’s education and the importance of the intermediate field resource, parents’ social class, suggest that there is same field transmission. The net contribution of parental income is at best one fifth compared to parental education. The differences over sibling types are less marked.

For gender specificity, table 3 displays the resource transmission broken down by parents’ gender, which shows that the multidimensionality is even more complex than simply in relation to collapsed parental resources. There is a substantial difference between mother’s and father’s influence within and between resources. For gross correlations, maternal or paternal education is most important for children’s education, while mother’s income matters the least. Using only mother’s income as a proxy of social origin in relation to children’s education would only capture about one tenth of the gross explanatory power of father’s education. Another finding is that the sum of the net contributions of mother’s and father’s education (when estimated separately) is lower than when they enter simultaneously as parental education. This suggests that there is an overlap between mother’s and father’s resources, which is captured in its whole when both are included. Turning to net correlations and teasing out separate parental transmission in detail, mothers and fathers display substantial net contributions in education. Moreover, the separate net influence mother’s education and social class are respectively marginally more important than the influence of the corresponding paternal resources. However, for income, fathers are substantially more influential than mothers. Any overlapping contribution does not seem to be picked up by mother’s income in the gross analysis, where it is dramatically lower than the income estimate for fathers. In other words, there is support for separate parental transmission in children’s education, where most of the difference between parents is in the income resource, but also with substantial unique contribution in education. There is a same gender transmission in (parental) education, where the contribution of mother’s education in explaining sister’s schooling is almost twice as high compared to father’s education. Accordingly, father’s education matter more for sons although the difference is slightly less pronounced. For parental social class there is no sign of same gender transmission, since mother’s social class explain more of children’s education compared to father’s social

*thus increase the test statistic (and the level of significance).* A typical finding is that .01 ICC unit difference in any given model estimate relative to the baseline gives a t value of 4.9 for the mixed sibling sample. For the slightly smaller brother and sister samples, a .01 ICC difference results in a t value of about 2.7 or 2.8. This means that a percentage point difference in the ICC always can be regarded as significant.
class over all sibling types. This goes also for parent’s income, where fathers clearly are dominant. However, the importance of father’s income is less distinct for sisters compared with the influence in regard to brothers – while the low influence of mother’s income is stable over sibling types.

**Sibling correlations in social class attainment**

For social class, the baseline correlations in entry to the service class range from .25 to .29. Parental social class and education explain children’s social class attainment better than parental income, although the differences are not as marked as in children’s education. However, as with children’s educational attainment, intergenerational inequality in children’s social class position is not unidimensional (i.e. reducible to any one variable proxy) because of the relatively large differences between the contributions of parental resources. For example, the gross importance of parental income is between roughly one half and two thirds to that of parental social class.

<table>
<thead>
<tr>
<th></th>
<th>Mixed</th>
<th></th>
<th></th>
<th>Sisters</th>
<th></th>
<th></th>
<th>Brothers</th>
<th></th>
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</thead>
<tbody>
<tr>
<td></td>
<td>ICC</td>
<td>s.e.</td>
<td>↓%</td>
<td>ICC</td>
<td>s.e.</td>
<td>↓%</td>
<td>ICC</td>
<td>s.e.</td>
</tr>
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<td><strong>Gross correlations</strong></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baseline</td>
<td>0.254</td>
<td>0.001</td>
<td>–</td>
<td>0.267</td>
<td>0.003</td>
<td>–</td>
<td>0.291</td>
<td>0.002</td>
</tr>
<tr>
<td>Edu_{parents}</td>
<td>0.175</td>
<td>0.001</td>
<td>31.1</td>
<td>0.194</td>
<td>0.003</td>
<td>27.1</td>
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<td>0.003</td>
</tr>
<tr>
<td>Class_{parents}</td>
<td>0.171</td>
<td>0.001</td>
<td>32.8</td>
<td>0.193</td>
<td>0.003</td>
<td>27.7</td>
<td>0.200</td>
<td>0.003</td>
</tr>
<tr>
<td>Inc_{parents}</td>
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<td>0.001</td>
<td>20.1</td>
<td>0.226</td>
<td>0.003</td>
<td>15.3</td>
<td>0.231</td>
<td>0.003</td>
</tr>
<tr>
<td><strong>Net correlations</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full model</td>
<td>0.149</td>
<td>0.001</td>
<td>–</td>
<td>0.173</td>
<td>0.003</td>
<td>–</td>
<td>0.176</td>
<td>0.003</td>
</tr>
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</tr>
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<td>0.003</td>
<td>1.8</td>
<td>0.183</td>
<td>0.003</td>
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The net correlations show a same resource transmission pattern, since parental social class is the resource that matter most in children’s class attainment. For mixed siblings, parental class contributes with 5.4 percent, while parent’s education account for 4.7 percent and parental income with just 2.4 percent – a rank order that is consistent over all sibling types. Compared to the previous outcome, children’s education, parental income matter relatively more for children’s social class. Moreover, parental education is almost on par with the explanatory
power of parental class. This result supports the same field transmission, although social class seems to be more proximate to the sociocultural field (indicated by education) rather than the economic field (as represented by income) – a result that makes the assumption in Bukodi and Goldthorpe (2013), that class is a more strict economic indicator, troublesome.

The results for gender specificity are displayed in Table 5. The difference in gross contributions are slightly more evenly spread compared to the case in children’s education. Again the outlier is mother’s income, which by far influences service class attainment the least (between 3.6 and 4.4 percent), while father’s education matters most (explaining about 20 to 24 percent). For separate parental transmission, the net correlations of mixed siblings display that mothers and fathers’ influences are quite similar for education and social class, although mothers are generally slightly more important. However, mother’s income virtually contributes with zero percent compared to the contribution of father’s income of roughly 2 percent. Both these patterns are similar to separate parental transmission in children’s education. For same gender transmission, again, mother’s education matters more for sisters social class attainment, while father’s education is more important for brother’s social class, although the differences are rather marginal. Small same gender transmission patterns also apply to mother’s and father’s social class, but clearly not for parent’s income, where the dominance of fathers is substantial.

Table 5. Sibling correlations in entry to the service class, gender specificity.

<table>
<thead>
<tr>
<th></th>
<th>Mixed ICC</th>
<th>Mixed s.e.</th>
<th>↓%</th>
<th>Sisters ICC</th>
<th>Sisters s.e.</th>
<th>↓%</th>
<th>Brothers ICC</th>
<th>Brothers s.e.</th>
<th>↓%</th>
</tr>
</thead>
<tbody>
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<td><strong>Gross correlations</strong></td>
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<td></td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>Baseline</td>
<td>0.254</td>
<td>0.001</td>
<td></td>
<td>0.267</td>
<td>0.003</td>
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<td>0.291</td>
<td>0.002</td>
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<tr>
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<td>20.0</td>
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<td>0.003</td>
<td>18.4</td>
</tr>
<tr>
<td>Edu\textsubscript{father}</td>
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<td>0.001</td>
<td>23.8</td>
<td>0.215</td>
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<td>0.235</td>
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<tr>
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<td>22.6</td>
<td>0.220</td>
<td>0.003</td>
<td>17.6</td>
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<td></td>
<td></td>
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<td></td>
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<td></td>
<td></td>
</tr>
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<td></td>
<td>0.173</td>
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<td>1.3</td>
<td>0.182</td>
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<td>2.6</td>
<td>0.182</td>
<td>0.003</td>
<td>2.0</td>
</tr>
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<td>2.1</td>
<td>0.177</td>
<td>0.003</td>
<td>1.6</td>
<td>0.183</td>
<td>0.003</td>
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<td>Inc\textsubscript{mother}</td>
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<td>0.178</td>
<td>0.003</td>
<td>1.8</td>
<td>0.183</td>
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<td>2.4</td>
</tr>
</tbody>
</table>
Sibling correlations in income attainment

For children’s income, the baseline sibling correlations range from .22 to .31, where same gender siblings, and especially brothers, show higher similarities. The various resource contributions for gross correlations are clearly not of equal weight. Parental education, which matter the least, explains from about one third to 40 percent of the gross influence of parental income. In other words, children’s income attainment is not very well captured by the educational level of parents. Income inequality is thus also subject to a multi- rather than unidimensional intergenerational transfer.

The net correlations in table 6 gives the most clear result in favor of same resource transmission: The importance of parental education is practically nonexistent, while parental social class matter marginally (about 1 percent) and parent’s income explain the highest proportion by far (between 9 to 14 percent). Children’s income is thus most importantly transferred over generations by means of parent’s income attainment. There is support for same field transmission, since social class matter more than education (both for gross and net correlations), however, the difference is rather small.

<table>
<thead>
<tr>
<th>Table 6. Sibling correlations in income, resource specificity.</th>
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<tbody>
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</tr>
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<td>ICC</td>
</tr>
<tr>
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<td>Edu&lt;sub&gt;parents&lt;/sub&gt;</td>
</tr>
<tr>
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</tr>
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</tr>
<tr>
<td>Inc&lt;sub&gt;parents&lt;/sub&gt;</td>
</tr>
</tbody>
</table>

As seen in table 7, the gross gender specificity contributions show that mother’s education only influence mixed siblings income about one fourth compared to father’s income. Surprisingly, mother’s income is an equally poor predictor as mother’s education. Regarding separate parental transmission, I find that neither parental education nor class show any substantial differences between mothers and fathers. Parental income on the other hand is strongly subject to a separate parental transmission pattern; father’s income contributes with
about 12 percent compared to the influence of mother’s income of roughly 2 percent for mixed siblings. Finally, there is no clear pattern of same gender transmission for parental education and social class. For parental income, again, fathers clearly influences children to a higher extent than mothers. However, the importance of mother’s income is much more pronounced for sisters (3 percent) compared to brothers (.6 percent). Accordingly, father’s income matter less for sisters (6.1 percent) and far more for brothers (12 percent). In other words, even though mother’s are not dominant in income, same gender transmission suggest less strong transmission of father’s income to daughter’s income and a more important contribution of mother’s income on sisters — although father’s income still is the most influential resource.15

Table 7. Sibling correlations in income, gender specificity.

<table>
<thead>
<tr>
<th></th>
<th>Mixed</th>
<th>Sisters</th>
<th>Brothers</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ICC</td>
<td>s.e.</td>
<td>↓%</td>
</tr>
<tr>
<td><strong>Gross correlations</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
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<td>-</td>
</tr>
<tr>
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<td>0.001</td>
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</tbody>
</table>

15 I have performed a robustness check substituting the long run income measure with parental and child earnings, using mean earnings for children when they are between 34-40 and collecting 10 year averages for parents. To account for intergenerational earnings distribution differences, I transformed the earnings measures to generational percentile ranks (Chetty et al. 2014), i.e. estimating separate rank distributions over sibling types, mothers and fathers. The results from the sensitivity analysis are in line with the main results, although the contributions of rank earnings generally explain less variance compared to long run income. This could be an effect of life-cycle bias thus attenuating the intergenerational associations. In other words, an economic indicator that contain as much information over a long(er) period of time is preferred. Results from the robustness check is available from the author on request.
Discussion

**Resource specificity**

The main result of this study suggests that social reproduction is multidimensional and subject to resource specificity in intergenerational transmission of inequality. First, same resource transmission is confirmed in all of the examined outcomes and over all sibling types, implying that the same parental resource as each respective outcomes contributes with the largest net explanatory power. Hence, one of the most important reproduction strategies for a parent who is rich in a given resource is to transfer advantage within the same resource to the child. This aligns with the idea of asset specificity in transaction cost economics (Williamson 1981), where optimal returns on an investment can be tied to specific transactions, in this case same intergenerational resource transfers. Accordingly, Bourdieu (2010 [1984]) argues that social reproduction occurs through the logic of capital specialization, i.e. parents advantaged in cultural (or educational) capital generally pursue investment and child advancement in the same capital form. For the fractions of the population that are relatively rich in economic capital, reproduction is instead most efficient by means of economic transmission. In other words, educational elites foster educational elites, while families rich in economic capital more easily transfer their advantage to children’s economic attainment. Arguably, this corresponds to family norms and dispositions on what kind status attainment that is preferred, e.g. families advantaged in economic capital thus value and orient status orientations toward economic goals.

Second, the results in this study generally support same field transmission of inequality. Socioeconomic fields are divided into a sociocultural and an economic sphere, where the first is represented by education and the latter by income. Proximity to one of these spheres increase the strength of the transmission. In other words, parental social class – occupying an intermediate position between the fields – is shown to be the most general of resources, since it is the second most important resource in children’s education and income. In this sense, service class parents hold a privileged position by transmitting a broad advantage to their children. Similarly, parental education and income are more important in this intermediate social class resource, than in the other field to which they belong. Moreover, I find that social class and education are more proximate compared to that of parental social class and income. Although the parental social class influence on children’s income is higher than that of parental education,
it still negligible. This result disputes the claim in, for example, Bukodi and Goldthorpe (2013) that social class can and should be used as a strict economic indicator – at least in terms of children’s income.

Transmission from one parental field to the other child field is suboptimal. On the one hand, the independent influence of parental income on children’s educational attainment is as low as between 1 and 1.4 percent, suggesting that a strict economic resource is relatively irrelevant to educational outcomes. This could possibly be an effect of the Swedish context, where educational inequality is intentionally mitigated by means of low cost student loans and generous benefits for higher education. On the other hand, and reflecting the opposite transmission, the independent contribution of parental education in explaining children’s income is virtually nonexistent (0 to .1 percent). This implies that capacities and conditions related to parental education (net of above parental social class and economic status) is unimportant for children’s income career. Since there are substantial gross correlations between parental education and children’s income (6.6 to 8.3 percent), they capture overlapping influences, i.e. common to either parental social class and/or parental income.

**Gender specificity**

The gender of the parent do matter in transmission of inequality, indicating that there is a separate parental transmission pattern. For mixed siblings, the mother’s social class and educational attainment is slightly more important compared to the corresponding status of the father, while fathers’ income matter substantially more than mother’s income over all outcomes. On the one hand, the implication is that mothers tend to do better in transferring benefits of relatively intangible resources, such as education and social class – although this influence is quite marginal and does not hold over all combinations of outcomes and sibling types. On the other hand, the result consistently show that fathers dominate the transmission of economic transmission. In practice, the father drives the influence of parental income as a whole. Additionally, not concerning the hierarchy of influence between parents, the results also show that there is a rather substantial separate influence of each parent’s education in children’s educational attainment (about 3 percent respectively). Consequently, it is important to consider and include information on both parents (Thaning and Hällsten 2018), at least in terms of education.

There is a mixed result for same gender transmission, i.e. that the parent with the same gender as the child matter more. Mother’s education explain sister’s educational and class
attainment better than father’s characteristics, while fathers’ education matter more for brother’s education and class outcomes – although, the differences are quite small. However, as mentioned above, father’s income clearly is more important than mother’s income. Importantly for same gender transmission, the results show that the strength of father’s income influence decreases for sister’s income compared to brothers or mixed siblings. Moreover, the contribution of mother’s income (even though undoubtedly less important than father’s income) increases for sister’s income.

It is possible that the importance of mothers’ income strengthens over generations due to the expansion of the female workforce and a narrowed gender pay gap (Boye, Halldén and Magnusson 2014). This could limit the generalizations of gender specificity in economic transmission to the studied cohorts. Although the results suggest that it can be important to account for both parents depending on the case, future research will have to establish if this is unique to more gender egalitarian contexts (like Sweden) or a general finding. Another alternative is that parental resources are affect children in other ways than in terms of gender. Korupp, Ganzeboom and Van Der Lippe (2002) have elaborated a “genderless” dominant versus a non-dominant approach, which at least in parental and child earnings transmission performs better than a gender version (Thaning and Hällsten 2018).

**Multidimensional perspective on socioeconomic transmission**

The results clearly show that socioeconomic background is not as simple as a one variable indicator – a single measure does not capture the multidimensionality in intergenerational transmission of inequality. To grasp the full influence of the family of origin, socioeconomic background have to be conceptualized as a multidimensional vector of resources. However, one should also consider to account for whether the bearer of a particular resource is a mother or a father, and to some extent also if the receiver is a son or a daughter. Although there is a substantial overlap between resources (even more so for mother’s and father’s) there is a risk of biased results and underestimations of the true effect of unequal conditions in the family of origin if gender and resource specificity are neglected.

In contrast to the results presented, the alternative view have long been that socioeconomic background resources are interchangeable (cf. Lazarsfeld 1939) and constitute general assets, which can be invested over different child resources without losing its particular strength. Even though this is not a dominant theoretical idea in contemporary sociology, the
empirical practice often revert into such a framework, simply by using only one indicator of socioeconomic background (Meraviglia and Buis 2015). To challenge this discrepancy between theory and practice, a multidimensional approach is warranted in order to distinguish between different transmission processes in intergenerational inequality.

A substantial finding of this study is that parental income constitutes a poor indicator of socioeconomic background when estimating children’s educational and social class attainment. In fact, comparing the gross contributions caused by parental income to parental education, the former contributes with less than half compared to the influence of the latter for children’s education. Similarly, parental education is a sub-optimal indicator of socioeconomic background when modeling children’s economic attainment – the gross contribution of parental education account for roughly 40 percent or lower compared to the explanatory power of parental income on children’s income. In sum, socioeconomic background cannot be sufficiently represented by a single variable, since it is multidimensional in its character.

Concerning the external validity of the results, international variation could limit generalizations to other countries (Tomescu-Dubrow and Domanski 2010). Sweden might represent a conservative test since intergenerational inequality is relatively low compared to other western countries (Erikson and Jonsson 1996:1-64). This could decrease both the sibling similarities as well as the contributions of family background resources. Furthermore, Sweden have state sponsored education and no tuition fees, suggesting a lower influence of economic means on educational outcomes, an institutional feature that might affect resource specificity. In contrary, gender specificity could potentially be weakened due to the relative cultural and economic equality between sexes in Sweden, i.e. suggesting a substitution effect between mother’s and father’s resources. However, it could also be the case that mothers matter more because they are more firmly established on the labor market and thus suggest increased gender specificity and specialization in transmission.

In similarity with most research in the status attainment tradition, the results in this study are descriptive in its character and thus make no causal claims. Although the results show that there is both resource and field specificity involved in intergenerational transmission of inequality, there is reason to proceed with some caution. The differences between the estimates are sometimes small. This means that some of the results, where resource differences in explanatory power are more marginal, may be particularly sensitive to coding practices and measurement error. Moreover, the question is if the inclusion of parental wealth in the net models would generate a different picture for both resource and gender specificity. Would the findings be challenged if SIOPS was considered instead of social class etcetera? Future research
have to further investigate if these transmission patterns hold over models specified in various different ways. Such suggestions include if the results are consistent when controlling for family structure and separation. For example, Erola and Jalovaara (2017) state that not only is the sibling correlations lower for individuals from single-mother households, but also that the importance of fathers not living with the family decreases. More knowledge on understanding the actual operative mechanisms that each resource proxy for is also warranted.

References


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