The Effect of Parental Loss on Social Mobility in Early Twentieth-Century Sweden

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ABSTRACT Parents are assumed to play a crucial role in the socioeconomic attainment of children. Through investments of both time and resources, they promote the ability, human capital, networks, and motivation of their children to advance socially, or at least to maintain their social position. Consequently, losing a parent in childhood could be detrimental to adult socioeconomic outcomes. We use full-count linked census data and a comprehensive death register to study the effect of parental loss on socioeconomic outcomes in adulthood in Sweden during the first half of the twentieth century. We employ sibling fixed-effects models and the Spanish flu as an exogenous mortality shock to assess the importance of endogeneity bias in associations between parental loss and socioeconomic outcomes. Maternal death led to worse socioeconomic outcomes in adulthood in terms of occupational and class attainment, as well as for social mobility. The effects seem to be causal but the magnitudes were small. For paternal death, we find no consistent pattern, and in most models there was no effect on sons' socioeconomic outcomes. The patterns were similar for sons and daughters and do not support the theory that parental loss had important negative effects on socioeconomic outcomes in adulthood.

KEYWORDS Parental loss • Social mobility • Social class • Sibling fixed effects

Introduction

Socioeconomic attainment depends strongly on parental socioeconomic status, especially the status of the fathers, but mothers' socioeconomic status is getting increasingly important (e.g., Beller 2009). Both theoretical models and empirical research support such an intergenerational association in socioeconomic attainment (Becker and Tomes 1986; Björklund and Jäntti 2012; Blanden 2013; Erikson and Goldthorpe 1992; Jonsson et al. 2009). Several pathways exist through which parents can directly influence their children's attainment—for example, access to resources and socialization, which require parents being alive and present during the upbringing of their children (Zeng and Xie 2014). It could therefore be expected that losing a parent, and especially a father, would negatively affect socioeconomic attainment across a wide range of societal contexts.

A large body of research has studied the association between family structure and childhood outcomes, while studies assessing the impact on outcomes in adulthood are less prominent (e.g., Bloome 2017; Fronstin et al. 2001; Lopoo and DeLeire 2014). Most of this latter research has focused on the impact of growing up with one absent biological parent, most often the father as a result of nonmarital childbearing or divorce. Attention has also been paid to the implications of parental death in childhood on socioeconomic outcomes in adulthood, but research on contemporary and historical Western contexts has not found consistent and important negative effects of losing a parent (e.g., Adda et al. 2011; Amato and Anthony 2014; Barclay and Hällsten 2022; Corak 2001; Kalil et al. 2016; Lang and Zagorsky 2001; Rosenbaum-Feldbrügge 2019). Most studies have focused on the impact of the deaths of fathers only, but some have also included maternal deaths (see, e.g., Barclay and Hällsten 2022; Lang and Zagorsky 2001; Pattersson et al. 2020; Rosenbaum-Feldbrügge 2019). Although there are exceptions (e.g., Kalil et al. 2016), most studies have been restricted to identifying statistical associations between parental death and children's outcomes in adulthood, without being able to address endogeneity issues or evaluate the causal interpretation of estimated effects.

In this study, we first examine the association between parental loss and the occupational and class attainment of men in Sweden in the first half of the twentieth century, using linked micro-level full-count census data. We ask whether experiencing the death of a parent during childhood affected socioeconomic attainment in adulthood, whether such an effect differed between the death of the mother or the father, and whether the timing of parental death in childhood mattered for the long-term consequences of parental loss. We also assess whether associations between parental death and socioeconomic outcomes in adulthood reflect causal effects or are the result of endogeneity bias.

We first analyze associations between losing a mother or a father and occupational attainment, class attainment, and social mobility in adulthood. We then estimate sibling fixed-effects models, which have been used in previous research to address issues of endogeneity in the relationship between presence of parents and children's outcomes in adulthood (e.g., Björklund and Sundström 2006; Ermisch and Francesconi 2001; Kalil et al. 2016). Since there are inherent limitations with the sibling fixed-effects approach when studying parental loss (see, e.g., Barclay and Hällsten 2022), we evaluate causality by considering deaths during the influenza pandemic of 1918–1919 as an exogenous adult mortality shock. Previous research has shown no socioeconomic gradient in excess mortality during the pandemic in Sweden (Bengtsson et al. 2018), and other confounders can be controlled for in the analysis. Occupational attainment in 1950 for individuals born in 1906–1910 and whose mother or father died during the peak flu period is compared with the attainment of children of the same cohorts with surviving parents, as well as with children whose parent(s) died before or after the flu epidemic.

Our linked census data set contains about 100,000 men born in 1906–1910 and observed in 1910 and 1950, for whom we have information about when their parents died, as well as the occupation of both fathers (in 1910) and themselves (in 1950). Because adult socioeconomic attainment is measured at ages 40–44 for our sample, most women in this age were married homemakers in 1950 and hence did not have a recorded occupation. Therefore, we limit the main analysis to men, but in

a supplementary analysis we also estimate models for the minority of women with occupational information.

Our study contributes by using full-count individual-level data for a historical context in which more than 10% of children experienced parental death and in which welfare society was still in its infancy and provided very limited support to compensate for the loss of a parent. In this context, we expect parental death, and especially the death of the father, to have been a significant shock and detrimental to adult socioeconomic achievement. Moreover, we address the potential endogeneity of parental death by estimating models using sibling fixed effects and exploiting an exogenous mortality shock known to have seriously affected adults in childbearing ages. These empirical designs enable us to assess the degree to which parental death had a causal effect on socioeconomic outcomes in adulthood. Finally, our study contributes to knowledge about the determinants of social reproduction in industrial society before the great expansion of higher education and the emergence of the service economy.

Theory and Previous Research

In the Becker and Tomes model (1986), socioeconomic status is determined by inherited and transmitted abilities (genes and "family culture"), as well as investments in human capital by individuals, parents, and society through public spending. Parents make investments in their children's potentials for socioeconomic attainment (e.g., earnings potentials) through time allocation, sharing of networks, and monetary spending affecting health, human capital, and motivation to succeed. Human capital investments during childhood are of special importance for later development, because total human capital is assumed to be proportional to the investments made by parents during childhood. This makes the presence of parents crucial for human capital investments and socioeconomic status attainment of children in adulthood, unlike inherited abilities and societal investments, which are also important but not affected by parental loss.

In research on family structure and socioeconomic attainment, three theories have been used to explain the impact of growing up in contexts other than with two biological parents: social control theory, stress theory, and economic deprivation (see, e.g., Bloome 2017; Hill et al. 2001; McLanahan and Bumpass 1988).

Intergenerational persistence in social and family outcomes increases with time spent together with both parents because of longer exposure to behavior, attitudes, and investments (e.g., Bloome 2017). Good parenting, investments in learning, transfers of skills, positive behaviors, and productive attitudes improve the social attainment of children, but poor parenting, adverse behavior, and unproductive attitudes are also more likely to be transmitted from parents to children when exposure is longer. In other words, the fact that parents have the opportunity to control and influence their children does not always mean that the influence will be beneficial, even though we would expect this in most cases.

Social control theory focuses on the impact of parents as role models and the importance of parental supervision (see, e.g., Bloome 2017; Hill et al. 2001; McLanahan and Bumpass 1988). In this theory, exposure to a certain family structure is most important, not change in the family structure. Remarriage after divorce or spousal

death could at least partly offset the potential negative consequences of living with a single parent. However, it may not fully counter an adverse situation as the stepparent may not be as effective in supervising the child or in promoting skills and learning.

According to *stress theory*, family transitions are disruptive and lead to lower intergenerational persistence in social and family outcomes (Hill et al. 2001; McLanahan and Bumpass 1988). Family transitions are related to lower child well-being as a result of disrupted routines and residential instability. In stress theory, change is important, which implies that remarriage may not help alleviate the negative impact but rather aggravate it by implying yet another potentially disruptive transition.

Family transitions often imply loss of income, which may cause early school leaving and early childbearing with negative effects on education, career, and social attainment in the long run (Hill and Duncan 1987; McLanahan and Bumpass 1988; McLanahan and Sandefur 1994). In the context of early twentieth-century Sweden, loss of the father can be expected to have caused *economic deprivation*, although the possibility of remarriage would at least partly alleviate this situation.

While these theories have mainly been used to explain the impact of family structure in contemporary Western societies, they are also relevant for earlier periods, such as Sweden in the first half of the twentieth century. Building on McLanahan and Percheski (2008), Rosenbaum-Feldbrügge (2019) outlined a model for the pathways between parental death and socioeconomic attainment in adulthood for a historical context (the Netherlands between 1850 and 1952), with different predictions for the death of the mother and the father. Paternal death generally affects the economic resources available for investments in the human capital of children. These resources are not strictly monetary (i.e., parental income or wealth) but also include social networks, which could promote children's career development. The loss of a father increases the risk of growing up poor or in circumstances that in different ways hinder the socioeconomic attainment of children. However, parental loss may also affect the quality of parenting. Mothers are of special importance for the early cognitive development of children and in providing emotional support (see, e.g., Rostila and Saarela 2011), and the loss of the mother could therefore be expected to be consequential for parenting quality. In addition, the loss of resources following paternal death can also be expected to affect the quality of parenting and thus indirectly the socioeconomic attainment of children.

In a male-breadwinner context, such as Sweden in the first half of the twentieth century (Stanfors 2014; Stanfors and Goldscheider 2017), we would expect the loss of the father to be particularly important for access to resources and beneficial networks that promote career and high socioeconomic status. The loss of the mother would directly affect parenting quality and emotional support available during the formative period in childhood. Both pathways could be expected to be important, although the loss of resources is probably easier to compensate for, through remarriage or transfers from kin, than the loss of emotional support and parenting quality, making the loss of the mother particularly important.

There is considerable empirical evidence that growing up without both parents is negatively associated with the well-being and educational achievement of children in contemporary Western countries (e.g., Amato and Keith 1991; McLanahan and Percheski 2008; McLanahan et al. 2013; for Sweden, see, e.g., Björklund and Chadwick 2003; Jonsson and Gähler 1997). Associations are usually similar for boys

and girls and seem rather independent of socioeconomic status (Barclay and Hällsten 2022; McLanahan and Percheski 2008). Most research focuses on the importance of divorce, but also compares outcomes from divorce to those from parental death to account for the obvious endogeneity bias in associations between divorce and child well-being (Amato and Anthony 2014; Corak 2001; Steele et al. 2009).

Associations between family structure and child outcomes may not reflect causal effects but may result from selection and endogeneity of family structure and family transitions with respect to child outcomes (Kalil et al. 2016; McLanahan et al. 2013). Studies trying to estimate causal effects using different empirical designs have come to somewhat diverging conclusions (see, e.g., Björklund and Sundström 2006; Ermisch and Francesconi 2001; Kalil et al. 2016; Lopoo and DeLeire 2014). In a review of 47 different studies, mostly from the United States, McLanahan et al. (2013) concluded that, overall, more advanced empirical designs still showed negative effects of father absence on different child outcomes (socioemotional development, risky behavior, and mental health).

A number of studies have looked specifically at parental death and found associations with various negative outcomes in childhood and adolescence, such as mental health problems (Berg et al. 2016; Brent et al. 2009), poor school performance (e.g., Amato and Anthony 2014; Berg et al. 2014; McLanahan and Percheski 2008; Steele et al. 2009), weaker intergenerational transmission of higher education (Björklund and Chadwick 2003; Kalil et al. 2016), and even higher mortality (Rostila and Saarela 2011). Often, but not always, the associations with parental death are weaker than for divorce, indicating that there is considerable endogeneity bias in the associations with divorce (McLanahan and Percheski 2008). It also seems that the negative effects of parental loss decline with age of the child at the time of parental death, as well as with time since losing the parent (see Rosenbaum-Feldbrügge 2019). Other studies have found no negative effects of father's death on socioeconomic and educational attainment in the United States and Canada in the 1980s and 1990s (Biblarz and Gottainer 2000; Corak 2001; Lang and Zagorsky 2001).

Turning to the limited evidence for historical contexts, van Poppel et al. (1998) found a significant negative association between father's death and the social class attainment of the son at the time of marriage, based on marriage certificates in The Hague (the Netherlands) in 1869–1871 and 1879–1880. In the most comprehensive historical study on the topic done so far, Rosenbaum-Feldbrügge (2019) analyzed the impact of parental death in childhood on socioeconomic attainment of both sons and daughters, using longitudinal data from the Historical Sample of the Netherlands, for about 15,000 men and women born in 1850–1922, and followed until 1952. The findings show that maternal death was clearly associated with socioeconomic attainment of both sons and daughters, while there was no consistent association for paternal death. Although these associations do not necessarily imply causality, the results are interpreted as evidence for the importance of maternal care and parenting quality, rather than pure economic resources, for children's careers and socioeconomic development in adulthood.

In light of these various theories, we expect parental loss in childhood to have had negative effects on socioeconomic attainment in adulthood in Sweden in the first half of the twentieth century. Both mothers and fathers were obviously important for child development. In a male-breadwinner context, such as early twentieth-century

Sweden, we expect mothers to have played a larger role for parenting quality and emotional support while fathers mattered more in terms of economic resources and occupation-related networks. We also expect that parental loss early in childhood had larger effects than when it happened later.

Context: Sweden 1910–1950

Sweden started to industrialize in the first half of the nineteenth century, but it was not until the end of the century that the real industrial breakthrough took place (Schön 2010). Around 1910, when our cohorts were born and the occupation of their fathers was measured, Sweden experienced a period of high economic growth and continued industrialization connected mainly to innovations related to electrification, including transportation and communication. The period between 1910 and 1950 saw the establishment of full parliamentary democracy and the Social Democratic Party as the leading political force in the country. It was also a period of some urbanization, but Sweden remained a rural society for most of the pre–World War II period. It was not until 1950 that half the Swedish population lived in towns (Statistiska Centralbyrån 1969: table 14).

Educational opportunities were highly unequal before the major educational expansion of the 1960s. In 1930, only 4% of all 16-year-olds completed at least nine years of schooling, which increased to about 26% in 1965 (Stanfors 2007:188). The expansion of higher education was very slow before 1950, and in the cohorts born up to 1929, no more than 6% ever acquired a higher education (9% for men) (Stanfors 2003:154, 228). Upward social mobility increased during much of the industrialization period, as the occupational structure changed, but it was not until after World War II that entry into the middle class of white-collar workers opened in earnest for people of working-class origins as a result of increased meritocratic recruitment and educational expansion (Dribe et al. 2015).

Access to higher education in this context was highly dependent on class origin, and hence on the father's, and possibly the grandfathers' (maternal and paternal), status and influence. Moreover, for occupational attainment below the top class of higher managers and professionals, there was strong intergenerational transmission of occupations connected to apprenticeship, occupational networks, and reputation (Dribe et al. 2015; Dribe and Helgertz 2016). Transmission of values, attitudes, knowledge, skills, and possibly economic resources were most likely crucial for occupational attainment, and hence for class attainment in this context.

In the period before 1950, Sweden was characterized by a male-breadwinner regime, in which most married women exited the labor force upon marriage and there was a sharp trade-off for women between family and work (Stanfors 2007). In 1920, when our cohort of men were children, only about 4% of married women were gainfully employed, in comparison to 52% of single women over age 15 (Silenstam 1970:105). The few women who invested in a labor market career (e.g., as teachers or nurses) usually abstained from marriage and children.

Some steps were taken to expand family and welfare policy in this period but no dramatic changes took place before the 1930s, and even before the 1950s the development was quite modest (Dribe and Smith 2021; Elmér 1971; Olofsson 2007;

Stanfors 2014; Stanfors and Goldscheider 2017). This means that during the forma-tive years of our cohorts, that is, before 1930, there was no comprehensive welfare state that could step in to fully compensate for the loss of a parent, even though some basic social welfare programs existed.

Thus, Sweden in the period 1910 to 1950 was rapidly industrializing but was still an unequal society with strong barriers to socioeconomic advancement and mobility, and with limited social welfare. Most mothers were homemakers and responsible for the upbringing of the children. Under such circumstances, it could be expected that parental loss in childhood would have detrimental effects on labor market outcomes in adulthood, perhaps even more so than today when welfare state institutions are much stronger and, to a greater extent, compensate for the loss, at least in terms of resources and securing educational opportunities.

Methods

Data and Sample

We use data from the Swedish full-count censuses of 1910 and 1950, which have been linked to a database with all deaths in Sweden from 1860 to 2016. The census of 1910 was registered and coded by the National Archives using the IPUMS format and is distributed by IPUMS International (Swedish National Archives and Minnesota Population Center 2016), while the census of 1950 was developed by Arkiv Digital (Arkiv Digital n.d.). The censuses report detailed information for all households and their members. Besides basic demographic characteristics such as gender and year of birth, they include information on individual occupations, marital status, parish and county of birth, and household structure. We complement the censuses with data from the Swedish Death Index (SDI) (Federation of Swedish Genealogical Societies 2019). The SDI contains information on sex and date and place of birth and death for virtually all individuals deceased in Sweden between 1860 and 2016. The SDI includes, with a few exceptions, complete information about names, dates of birth and death, marital status, and place of death, and is almost complete (98.5%) regarding place of birth.

Both the 1950 census and the SDI include unique identity numbers for all indi-viduals who died after 1947, when the numbers were introduced. These numbers allow us to directly link all individuals in the 1950 census to the SDI. The censuses of 1910 and 1950, as well as the SDI, also include names and surnames of each indi-vidual. This enables the use of probabilistic linking methods to link individuals from the 1910 census to the SDI, provided that they died in Sweden. The information contained in the sources is relatively accurate, which allows us to attain high linkage rates and low false positive rates (linkage rates are around 70%; see Dribe et al. 2019; Eriksson 2015). Through the SDI, we get a link between the 1910 and 1950 censuses and information about when the mother and the father died.

The derivation of the analytic sample is displayed in Figure 1. Initially we sample all men born between 1906 and 1910 who are present in the 1910 census. We require that they are also present in the SDI, that is, that they died in Sweden and can be linked to the SDI; about 70% meet this criterion. We remove four individuals who lacked a birth date in the SDI. In the next step, we keep the individuals for whom the
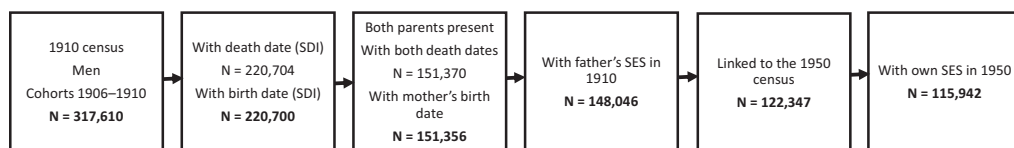
Fig. 1 Derivation of the analytic sample. See Table 1 for sources. SDI = Swedish Death Index. SES = socio-economic status.

deaths of both parents are recorded in the SDI, which is 69% of the remaining individuals in the sample. We further delete 14 individuals for whom there is no information on the birth date of the mother. Of the individuals in this sample, we have father's socioeconomic status in 1910 for 98%, and of these 78% can be linked to the 1950 census and have coded occupational information in 1950. The final analytic sample consists of 115,942 individuals, which constitutes 37% of the original cohorts present in 1910.

We can link women across censuses at similar rates as men, which is a unique feature of the Swedish historical censuses (Dribe et al. 2019; Eriksson 2015). However, Sweden in 1950, when we measure adult socioeconomic attainment, was a male-breadwinner society in which a majority of married women were homemakers. Not until the 1960s did labor force participation of married women start to increase more profoundly (Stanfors 2007, 2014; Stanfors and Goldscheider 2017). This implies that most women in our cohorts (aged 40–44 in 1950) did not have a recorded occupation, which is why we focus our main analysis on men only. Of the almost 122,000 women we link between 1910 and 1950, only 29,000 have information on occupation (compared with 116,000 out of 122,000 for men). This constitutes less than 10% of the original cohorts of women present in 1910. In the online supplementary material, we provide estimates for these women with information on occupation in 1950, but we do not include them in the main analysis.

Variables

In the analysis, we include all individuals born from 1906 to 1910, aged 0–4 in the 1910 census. We distinguish the age of the child when the parents died: 0–7, 8–14, 15–19, and 20 or older. These age-groups capture early childhood before entering school, the main school ages, and later childhood and adolescence. With regard to parental characteristics, we include controls for father's socioeconomic status and age in the census of observation and maternal age at birth. Socioeconomic status is measured by two different indicators, both based on occupations coded in HISCO (van Leeuwen et al. 2002).[1] The HISCO codes were used to classify occupations into a continuous occupation score, HISCAM, as well as a social class scheme, HISCLASS.

HISCAM determines the position of an occupation in the overall hierarchy on the basis of social interaction patterns, mainly using information on marriage and partner

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[1] The occupational coding was carried out within the SwedPop project, a national collaboration of Swedish historical databases (www.swedpop.se).

selection (Lambert et al. 2013). It is based on the interaction between people with different occupations and is translated into a relative position in a social hierarchy. HISCAM is standardized to have a mean of 50 and a standard deviation of 15 in a nationally representative population, and its values range from 39.9 to 99. We employ the universal scale rather than the Sweden-specific version owing to the small sample size used in constructing the Swedish HISCAM scale. In our father population in 1910, the mean is 54.8, and in the son population in 1950, the mean is 59.0, which indicates some absolute upward mobility between generations.

HISCLASS is a 12-category occupational classification scheme based on skill level, degree of supervision, whether manual or nonmanual, and whether urban or rural: (1) higher managers; (2) higher professionals; (3) lower managers; (4) lower professionals and clerical and sales personnel; (5) lower clerical and sales personnel; (6) foremen; (7) medium-skilled workers; (8) farmers and fishermen; (9) lower-skilled workers; (10) lower-skilled farm workers; (11) unskilled workers; and (12) unskilled farm workers (van Leeuwen and Maas 2011). In the analysis, we use a 10-class version of the scheme, merging the lower-skilled workers and lower-skilled farm workers, and the unskilled workers and unskilled farm workers. We study class attainment in two broader classes: white collar (HISCLASS 1–5) and unskilled workers (HISCLASS 9–12). We also analyze social mobility by comparing the HISCLASS (using 10 classes) of the father in 1910 to that of the son in 1950.

We further control for household composition by adding indicators for having a stepparent before age 20 (i.e., that the surviving parent remarried before the child turned 20) and presence of younger and older siblings in 1910. Stepparents were identified by the time of last change in marital status for the surviving parent, as indicated at the time of death in the SDI. In the case where the last change in marital status of the surviving spouse was later than the death of the spouse, we know that the surviving spouse remarried and that the child under study had a stepparent. We do not know when the remarriage took place, which makes the stepparent variable rather imprecise. In some cases the stepparent may have arrived after the child left home, in which cases the impact on socioeconomic attainment should have been small. We also control for whether the parental household was located in an urban or rural environment in 1910.

Table 1 shows the descriptive statistics of the different samples. There are no large differences between the analytic sample and the census of 1910. There is an overrepresentation of individuals from rural areas in the analytic sample, which is related to differential linkage rates: 82.9% of individuals in the analytic sample reside in rural areas in 1910, while this proportion is only 79.3% in the full sample in 1910. There is also an overrepresentation of individuals with older siblings in 1910 but an underrepresentation of people with younger siblings. More importantly, the socioeconomic distributions are highly similar between the two samples, which is clear when excluding the individuals with no information in 1910. The only major difference is a somewhat higher proportion of farmers (HISCLASS 8) in the analytic sample compared with the full sample (26.0% vs. 23.8% of the individuals with an occupation reported).

Turning to the main variable of interest, parental death, about 3% of individuals lost their mothers before age eight, and an additional 5% before age 15. The figures are a bit higher for losing a father for ages over seven. Overall, 11% of the sons lost their mother, and 13% lost their father, before age 20. Twenty-three percent of sons

Table 1 Descriptive statistics

	1910 Census, Cohorts 1906–1910	Analytic Sample	Siblings Sample
Year of Birth (%)			
1906	19.4	19.1	20.4
1907	19.6	19.6	18.6
1908	20.0	20.2	20.1
1909	20.6	20.8	19.5
1910	20.5	20.4	21.3
Place of Residence in 1910 (%)			
Rural	79.3	82.9	85.2
Urban	20.7	17.1	14.8
Presence of Older Siblings in 1910 (%)			
No	35.6	25.8	16.0
Yes	62.4	74.2	84.0
N.A.	2.0	0.0	0.0
Presence of Younger Siblings in 1910 (%)			
No	63.9	67.1	44.3
Yes	34.1	32.9	55.7
N.A.	2.0	0.0	0.0
Father's Age in 1910 (mean, SD)	36.7 (9.9)	36.4 (7.7)	35.8 (7.0)
Father's HISCAM in 1910 (mean, SD)	54.8 (8.5)	54.4 (8.1)	54.0 (7.6)
Father's HISCLASS in 1910 (%)			
Higher managers	0.6	0.5	0.4
Higher professionals	1.2	1.1	0.8
Lower managers	3.4	3.6	3.4
Lower professionals/clerical and sales personnel	4.1	4.3	3.9
Lower clerical and sales personnel	1.4	1.4	1.3
Foremen	1.7	1.9	1.8
Medium-skilled workers	13.4	14.4	14.1
Farmers and fishermen	21.0	26.0	27.5
Lower-skilled workers	23.0	26.2	26.7
Unskilled workers	18.4	20.5	20.0
N.A.	11.8	0.0	0.0
Mother's Death at Child's Age (%)			
0–7		3.0	2.8
8–14		4.8	4.9
15–19		3.1	2.9
After 20		89.1	89.4
Father's Death at Child's Age (%)			
0–7		2.9	2.5
8–14		5.3	4.9
15–19		4.4	4.0
After 20		87.5	88.6
Mother's Age at Birth (mean, SD)		31.0 (6.4)	30.5 (5.7)
Stepmother Before Turning 20 (%)			
No		93.7	94.1
Yes		1.9	2.0
N.A.		4.3	3.9
Stepfather Before Turning 20 (%)			
No		95.9	96.0
Yes		0.3	0.3
N.A.		3.8	3.7

Table 1 (continued)

	1910 Census, Cohorts 1906–1910	Analytic Sample	Siblings Sample
White Collar (HISCLASS 1–5) (%)			
No		77.0	79.7
Yes		23.0	20.3
Lower Blue Collar (HISCLASS 9–12) (%)			
No		57.2	54.6
Yes		42.8	45.4
Upward Mobility (%)			
No		58.1	59.6
Yes		41.9	40.4
Downward Mobility (%)			
No		73.6	71.9
Yes		26.4	28.1
HISCAM in 1950 (mean, SD)		59.0 (10.4)	58.2 (9.7)
HISCLASS in 1950 (%)			
Higher managers		1.4	1.1
Higher professionals		3.7	2.7
Lower managers		6.4	6.2
Lower professionals/clerical and sales personnel		6.6	5.8
Lower clerical and sales personnel		4.9	4.4
Foremen		2.8	2.8
Medium-skilled workers		16.2	16.4
Farmers and fishermen		15.2	15.1
Lower-skilled workers		26.4	28.1
Unskilled workers		16.3	17.3
N	317,197	115,942	33,727

Note: N.A.=not available.

Sources: Arkiv Digital (n.d.); Federation of Swedish Genealogical Societies (2019); Swedish National Archives and Minnesota Population Center (2016).

ended up in the white-collar class in 1950, and 43% ended up as unskilled workers. More than 40% experienced upward social mobility and 26% experienced downward mobility, leaving 32% in the same occupational class as their fathers, even when applying the 10-category class scheme.

In comparing the main analytic sample and the sibling sample, occupational status and class structure are similar, but the sibling sample is slightly more rural. The proportions losing a father or mother, as well as the proportions having a stepparent, are similar between the samples. The sibling sample has a lower proportion of white-collar workers, a higher proportion of lower blue-collar workers, less upward mobility, and more downward mobility than the main sample.

Analytic Strategy

We estimate the association between parental death at different ages of the child and socioeconomic outcomes in adulthood using ordinary least-squares (OLS)

regression. We add control variables sequentially and include county fixed effects and sibling fixed effects in different specifications. In some models we include interactions between parental death and presence of stepparents, and the occupational status of the father, respectively, to assess the extent to which associations differ across subgroups.

The sibling fixed-effects models adjust for all factors shared between siblings and constrain identification of effects to the variation between the siblings in the age at which they experienced the death of the parent (McLanahan et al. 2013). In other words, siblings belonging to the same age-group at parental death will not contribute to identification, rather only those siblings who are in different age-groups when parents die. The main limitation with these models, apart from the reduced sample size, is that it is impossible to ascertain that differences in outcomes between siblings are not related to other systematic differences between the siblings than the difference in age at bereavement—for example, that older siblings by definition will be older when parents die and may be treated differently, such as being forced into more adult roles as a response to parental death or differing in other ways from their younger siblings (see Kalil et al. 2016).

We therefore also assess the importance of endogeneity bias in these estimates by using an alternative empirical strategy in which we compare the effects of parental death during the influenza pandemic of 1918–1919 (the Spanish flu) to the effects of parental death in nonpandemic periods. The Spanish flu hit Sweden mainly during the fall of 1918 and in a weaker wave in the spring of 1919, and in total about 35,000 people died from the flu out of a population of 5.8 million. In addition, mortality increased from other related diseases, such as pneumonia, yielding estimates of excess mortality above 40,000. Following Bengtsson et al. (2018), we define the pandemic period as June 1, 1918–June 30, 1919. We assume that parental death during the pandemic was an exogenous shock with respect to socioeconomic attainment in 1950, which is supported by the lack of a consistent class gradient in excess pandemic mortality in Sweden (see Bengtsson et al. 2018). Therefore, assuming that pandemic deaths were exogenous, we expect effects of parental death in the nonpandemic period to be larger than in the pandemic period if estimates are affected by endogeneity bias.

Results

Occupational Attainment

Table 2 displays the estimates of the associations between parental loss and occupational attainment as measured by HISCAM. Results for six different models are shown, sequentially adding different control variables. The first four are based on the main sample and the last two on the sibling sample. Models 4 and 5 are identical in terms of variables but are estimated on the two different samples, with the aim to show that the results do not differ markedly between the main sample and the sibling sample before adding the sibling fixed effects. The first model includes controls only for father's occupational status in 1910, year of birth, mother's age at birth of the child, and father's age in 1910. In this model, there is a clear associa-

Table 2 OLS regression estimates of parental loss on HISCAM attainment in 1950

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Mother Dead at Age 0–7	−0.701***	−0.708***	−0.893***	−0.862***	−1.178***	−0.113
Mother Dead at Age 8–14	−0.804***	−0.782***	−0.888***	−0.863***	−1.094***	−0.152
Mother Dead at Age 15–19	−0.187	−0.204	−0.229	−0.272	−0.795**	−0.126
Mother Dead After 20	ref.	ref.	ref.	ref.	ref.	ref.
Father Dead at Age 0–7	0.034	0.011	0.084	−0.057	−0.269	−0.667
Father Dead at Age 8–14	0.341**	0.293*	0.321**	0.157	0.270	−0.177
Father Dead at Age 15–19	0.187	0.163	0.166	0.054	0.236	−0.349
Father Dead After 20	ref.	ref.	ref.	ref.	ref.	ref.
Controls						
Cohort fixed effects	Y	Y	Y	Y	Y	Y
Siblings	N	Y	Y	Y	Y	Y
Stepparents	N	N	Y	Y	Y	N
Urban	N	N	N	Y	Y	N
County fixed effects	N	N	N	Y	Y	N
Sibling fixed effects	N	N	N	N	N	Y
N	115,942	115,942	115,942	115,942	33,727	33,727
Adjusted R^2	.172	.177	.177	.202	.173	.001

Notes: All models include controls for father's socioeconomic status in 1910 (except Model 6), year of birth, mother's age at birth of child, and father's age in 1910 (except Model 6). Full model estimates are available in the online appendix.

Sources: See Table 1.

*p<.05; **p<.01; ***p<.001

tion between maternal death and occupational attainment. The largest effect size is found when the mother died before age 15, and then the effect size declines by age at death of the mother. The magnitudes indicate that losing the mother before age 15 lowers the average HISCAM score by less than 1 unit (0.8), which is a small effect.[2] For paternal death, there is a *positive* association at ages 8–14. The estimate is also statistically significant but of a very low magnitude (0.3). For the other age-groups the estimates are even lower, and not statistically significant, indicating that there is no important association between father's death and socioeconomic attainment in adulthood.

Adding control variables in Models 2–4 changes the result somewhat but does not alter the main pattern; the death of the mother is still more consequential than the death of the father for socioeconomic attainment in adulthood. In the full Model 4, including county of residence fixed effects, only the death of the mother at ages below 15 shows significant associations with socioeconomic attainment, and the magnitudes are similar to those of the first model (0.9). For experiencing a mother's death at older ages, as well as for father's death at all ages, the associations are weak and not statistically significant, indicating that there is no association between parental death and socioeconomic attainment in these groups.

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[2] The standard deviation of HISCAM measured in 1950 is 10.4 (see Table 1). The estimated effect is thus less than one tenth of a standard deviation.

The full model for the sibling sample (Model 5) shows a similar pattern as for the main sample, and the associations are somewhat stronger for mother's death below age 15. In the sibling fixed-effects model (Model 6), none of the estimates are statistically significant for maternal death, and the magnitude of the associations is much smaller than in the models without the sibling fixed effects. For paternal death, the estimates are larger in the sibling sample and even larger in the sibling fixed-effects model, but they are not statistically significant.

Figure S1 (in the online appendix) shows predictions from a model with interactions between parental death and presence of a stepparent. It displays the predicted coefficients of losing a parent at different ages by presence of a stepparent. Clearly, the presence of a stepmother does not affect the association between maternal death and occupational attainment, and the same is true for the presence of a stepfather when losing a father before age 15 (Figure S1, panel A). For those losing their father after age 14, having a stepfather actually lowers the occupational attainment compared with those losing their father at the same age without having a stepfather (Figure S1, panel B). Hence, in most cases, stepparents do not seem to change the association between parental death and occupational attainment.

Figure S2 (online appendix) shows predictions for the interaction between the occupational status of the father in 1910 and parental death at different ages. When fathers have higher occupational status, the association between losing the mother and own occupational status is stronger than when the occupational status of the father is lower (Figure S2, panel A). The pattern is similar for paternal death (Figure S2, panel B), but the magnitudes of the differences are much smaller ($p < .05$ when comparing the slope for paternal death at ages 15–19 to the slope of paternal death after 20). These results show that the detrimental effect of losing the mother is somewhat larger for sons from higher status origins.

Class Attainment

Table 3 shows estimates for white-collar attainment (HISCLASS 1–5). For maternal death there is a consistent negative association in all models using the main sample (Models 1–4), with larger effect sizes the earlier in life the mother died. As for occupational attainment, the estimates for the sibling sample are somewhat larger than in the main sample, but after adding the sibling fixed-effects estimates, both are much smaller and not statistically significant. Overall, adding the control variables does not change the pattern. Losing the mother before age eight is associated with a 3–4 percentage points lower probability of attaining white-collar status in adulthood (five percentage points in the sibling sample). Paternal death before age 15 does not influence the probability of attaining white-collar status at all (low effect sizes and not statistically significant). The only exception is the sibling fixed effects model, where effect sizes are larger but not statistically significant.

The death of both the mother and the father increases the probability of ending up as an unskilled worker (Table 4). The estimates are quite similar in the different models without the sibling fixed effects (Models 1–5), and the effect sizes are roughly twice as large for maternal death than for paternal death. Losing a mother before age 15 is associated with a 4–6 percentage points higher probability of ending up as an

Table 3 OLS regression estimates of parental loss on white-collar attainment (HISCLASS 1–5) in 1950

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Mother Dead at Age 0–7	−0.033***	−0.033***	−0.038***	−0.038***	−0.051***	−0.016
Mother Dead at Age 8–14	−0.025***	−0.024***	−0.027***	−0.027***	−0.039***	0.008
Mother Dead at Age 15–19	−0.021***	−0.022***	−0.023***	−0.024***	−0.038***	0.006
Mother Dead After 20	ref.	ref.	ref.	ref.	ref.	ref.
Father Dead at Age 0–7	−0.006	−0.008	−0.005	−0.009	0.000	−0.042
Father Dead at Age 8–14	−0.001	−0.004	−0.003	−0.007	−0.002	−0.012
Father Dead at Age 15–19	0.016**	0.015**	0.015**	0.011*	0.020	0.011
Father Dead After 20	ref.	ref.	ref.	ref.	ref.	ref.
Controls						
Cohort fixed effects	Y	Y	Y	Y	Y	Y
Siblings	N	Y	Y	Y	Y	Y
Stepparents	N	N	Y	Y	Y	N
Urban	N	N	N	Y	Y	N
County fixed effects	N	N	N	Y	Y	N
Sibling fixed effects	N	N	N	N	N	Y
N	115,942	115,942	115,942	115,942	33,727	33,727
Adjusted R^2	.131	.136	.136	.150	.119	.002

Note: See Table 2.

Sources: See Table 1.

*$p<.05$; **$p<.01$; ***$p<.001$

Table 4 OLS regression estimates of parental loss on lower blue-collar attainment (HISCLASS 9–12) in 1950

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Mother Dead at Age 0–7	0.049***	0.049***	0.059***	0.055***	0.065***	0.104
Mother Dead at Age 8–14	0.043***	0.042***	0.047***	0.045***	0.049***	0.065
Mother Dead at Age 15–19	0.024**	0.025**	0.026**	0.025**	0.021	−0.002
Mother Dead After 20	ref.	ref.	ref.	ref.	ref.	ref.
Father Dead at Age 0–7	0.029***	0.030***	0.027**	0.027**	0.024	0.044
Father Dead at Age 8–14	0.023***	0.025***	0.024***	0.025***	0.015	−0.009
Father Dead at Age 15–19	0.018*	0.019**	0.019**	0.020**	0.010	−0.022
Father Dead After 20	ref.	ref.	ref.	ref.	ref.	ref.
Controls						
Cohort fixed effects	Y	Y	Y	Y	Y	Y
Siblings	N	Y	Y	Y	Y	Y
Stepparents	N	N	Y	Y	Y	N
Urban	N	N	N	Y	Y	N
County fixed effects	N	N	N	Y	Y	N
Sibling fixed effects	N	N	N	N	N	Y
N	115,942	115,942	115,942	115,942	33,727	33,727
Adjusted R^2	.065	.069	.069	.077	.070	.001

Note: See Table 2.

Sources: See Table 1.

*$p<.05$; **$p<.01$; ***$p<.001$

unskilled worker, while the corresponding figures for paternal death are 2–3 percentage points. In the sibling fixed-effects models, the effect sizes are similar but not statistically significant.

Tables S7–S9 in the online appendix show estimates for socioeconomic attainment for women who have a registered occupation in 1950. As explained earlier, we do not include women in the main analysis because we have occupational information for only a minority of women in 1950 (as most are married housewives when they are followed up). Hence, the sample size is much smaller than for men, and this is especially clear in the sibling fixed-effects models. Nonetheless, the results for women are overall highly similar to those for men. Mother's death is associated with lower occupational attainment in all models except the sibling fixed-effects model, while there are no consistent associations with father's death (see Table S7). Effect sizes are about twice as large for experiencing the death of the mother under age 15 than between 15 and 19, suggesting that maternal death is associated with about a one-unit-lower HISCAM attainment, which is similar for men (about 0.8).

Mother's death is also associated with lower chances of white-collar attainment, as is the case for men, and magnitudes are somewhat larger than for men, indicating a 4–6 percentage points lower probability of attaining white-collar status when the mother's death occurs when the child is under age 15 (see Table S8 in the online appendix). For father's death there is no consistent pattern, and most of the estimates are small and not statistically significant. Finally, mother's death is associated with higher risks of ending up as a lower blue-collar worker, but the estimates are not statistically significant. Effect sizes are, however, similar in magnitude to those for men. Also, for father's death, most of the estimates suggest higher risks of low socioeconomic attainment, but few estimates are statistically significant. Hence, even though there is much greater uncertainty regarding the estimates for women, the patterns are overall quite similar to those for men, suggesting that sons and daughters are similarly affected by parental death.

Social Mobility

Table 5 shows estimates for the probability of upward social mobility as measured by the 10-category class scheme. In the models without sibling fixed effects, maternal death consistently lowered the probability of advancing socially, with the largest magnitudes for early maternal death. Losing the mother before age eight lowers the probability of upward mobility by about 2–5 percentage points. In the sibling fixed-effects model, the effect of maternal death is close to zero. Surprisingly, paternal death increased the chance of upward mobility in all models except the sibling fixed-effects model, where the association is negative at ages below 15, but few of the estimates are statistically significant.

Table 6 shows estimates for downward social mobility, and here, as expected, maternal death shows a positive association in all models. The estimates are similar across specifications and indicate a 4–6 percentage points higher probability of downward social mobility if the mother dies when the child is below age eight. There is a somewhat weaker association for maternal death at ages 8–14, but no association for experiencing maternal death later in life. In the sibling fixed-effects model, the

Table 5 OLS regression estimates of parental loss on upward mobility (own HISCLASS in 1950 > father's HISCLASS in 1910)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Mother Dead at Age 0–7	−0.023**	−0.024**	−0.030**	−0.027**	−0.045**	−0.004
Mother Dead at Age 8–14	−0.024***	−0.023***	−0.026***	−0.025***	−0.034**	−0.007
Mother Dead at Age 15–19	−0.002	−0.003	−0.003	−0.004	−0.004	0.031
Mother Dead After 20	ref.	ref.	ref.	ref.	ref.	ref.
Father Dead at Age 0–7	0.012	0.011	0.014	0.010	0.015	−0.033
Father Dead at Age 8–14	0.014*	0.013*	0.014*	0.010	0.021	−0.011
Father Dead at Age 15–19	0.014	0.013	0.013	0.010	0.025	0.028
Father Dead After 20	ref.	ref.	ref.	ref.	ref.	ref.
Controls						
Cohort fixed effects	Y	Y	Y	Y	Y	Y
Siblings	N	Y	Y	Y	Y	Y
Stepparents	N	N	Y	Y	Y	N
Urban	N	N	N	Y	Y	N
County fixed effects	N	N	N	Y	Y	N
Sibling fixed effects	N	N	N	N	N	Y
N	115,942	115,942	115,942	115,942	33,727	33,727
Adjusted R^2	.021	.023	.023	.036	.034	.001

Note: See Table 2.

Sources: See Table 1.

*p<.05; **p<.01; ***p<.001

Table 6 OLS regression estimates of parental loss on downward mobility (own HISCLASS in 1950 < father's HISCLASS in 1910)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Mother Dead at Age 0–7	0.038***	0.038***	0.044***	0.062***	0.042***	0.071
Mother Dead at Age 8–14	0.029***	0.028***	0.031***	0.034**	0.030***	0.056
Mother Dead at Age 15–19	0.010	0.010	0.011	−0.012	0.011	0.013
Mother Dead After 20	ref.	ref.	ref.	ref.	ref.	ref.
Father Dead at Age 0–7	0.020*	0.021**	0.018*	0.021	0.021*	0.044
Father Dead at Age 8–14	0.008	0.010	0.009	0.005	0.011	0.009
Father Dead at Age 15–19	0.007	0.007	0.007	−0.001	0.009	−0.026
Father Dead After 20	ref.	ref.	ref.	ref.	ref.	ref.
Controls						
Cohort fixed effects	Y	Y	Y	Y	Y	Y
Siblings	N	Y	Y	Y	Y	Y
Stepparents	N	N	Y	Y	Y	N
Urban	N	N	N	Y	Y	N
County fixed effects	N	N	N	Y	Y	N
Sibling fixed effects	N	N	N	N	N	Y
N	115,942	115,942	115,942	115,942	33,727	33,727
Adjusted R^2	.034	.037	.037	.039	.042	.001

Note: See Table 2.

Sources: See Table 1.

*p<.05; **p<.01; ***p<.001

Table 7 Comparison of effects of parental loss in pandemic and nonpandemic periods

A. Main Model	HISCAM	White Collar	Lower Blue Collar	Upward Mobility	Downward Mobility
Mother Dead at Age 0–14 (pandemic)	−1.085***	−0.031**	0.075***	−0.040**	0.024*
Mother Dead at Age 0–14 (nonpandemic)	−0.854***	−0.031***	0.047***	−0.025***	0.038***
Mother Dead at Age 15–19	−0.230	−0.023***	0.026**	−0.003	0.011
Mother Dead After 20	ref.	ref.	ref.	ref.	ref.
Father Dead at Age 0–14 (pandemic)	0.145	−0.001	0.021	0.013	−0.003
Father Dead at Age 0–14 (nonpandemic)	0.256*	−0.004	0.026***	0.014*	0.015**
Father Dead at Age 15–19	0.167	0.015**	0.019**	0.013	0.007
Father Dead After 20	ref.	ref.	ref.	ref.	ref.
N	115,942	115,942	115,942	115,942	115,942
Adjusted R^2	.177	.136	.069	.023	.037

B. Model With Control for Urban and County of Residence in 1910	HISCAM	White Collar	Lower Blue Collar	Upward Mobility	Downward Mobility
Mother Dead at Age 0–14 (pandemic)	−1.141***	−0.033**	0.072***	−0.041**	0.025*
Mother Dead at Age 0–14 (nonpandemic)	−0.811***	−0.030***	0.044***	−0.022***	0.036***
Mother Dead at Age 15–19	−0.272	−0.024***	0.024**	−0.004	0.011
Mother Dead After 20	ref.	ref.	ref.	ref.	ref.
Father Dead at Age 0–14 (pandemic)	−0.031	−0.005	0.011	0.008	−0.000
Father Dead at Age 0–14 (nonpandemic)	0.103	−0.008	0.027***	0.010	0.017**
Father Dead at Age 15–19	0.054	0.011*	0.011**	0.010	0.009
Father Dead After 20	ref.	ref.	ref.	ref.	ref.
N	115,942	115,942	115,942	115,942	115,942
Adjusted R^2	.202	.150	.077	.036	.042

Notes: All models include controls for father's HISCAM/HISCLASS in 1910, year of birth, mother's age at birth of child, father's age in 1910, presence of siblings, and stepparents.

Sources: See Table 1.

*p<.05; **p<.01; ***p<.001

estimates are somewhat larger but not statistically significant. Paternal death under age eight is also associated with higher risks of downward mobility in most models, but effect sizes are lower than for maternal deaths and not always statistically significant.

Assessing Endogeneity Bias

Next, we turn to the comparison of the impact of parental death during the influenza pandemic of 1918–1919 with the impact of parental death in nonpandemic periods. If parental death is endogenous with respect to children's socioeconomic outcomes, we expect the main estimates to be upwardly biased, and the estimated effect of parental death during the pandemic to be lower than that for nonpandemic deaths.

Table 7 shows the estimates for all socioeconomic outcomes. Panel A provides estimates for the main model (same model as in column 3 in Tables 2–6), while panel B includes controls for urban residence and county of residence fixed effects. The estimates for maternal death are in most cases similar for pandemic and nonpandemic

deaths, and if anything the estimates for pandemic deaths are larger than for nonpandemic deaths. The only exception is for downward social mobility, where the estimates are lower for the pandemic deaths. This suggests that endogeneity bias is not a major problem in the main estimates of maternal death in Tables 2–6.

For paternal death the patterns are not as consistent, which is also the case in the analysis of the overall associations. In most models, the estimates for pandemic deaths are close to zero, while the estimates for nonpandemic deaths are larger but still quite small. This shows that the effect of paternal death in childhood on socioeconomic attainment and mobility in adulthood is much weaker and less consistent than the effects of maternal deaths, and primarily the result of selection effects.

Conclusions

Parental death can be expected to negatively affect children's socioeconomic attainment both historically and today. Different theories predict that growing up without both biological parents has detrimental consequences for various outcomes in childhood and in adulthood. Investments made by both parents are important to equip children with the abilities, resources, networks, and motivation required to maintain a high socioeconomic status or climb the social ladder. Parents also supervise and control the behavior of their children. Losing a parent can cause stress for both children and the surviving parent, as well as disrupt parental investments and supervision, which could be expected to worsen the prospects for children on the labor market and negatively affect socioeconomic attainment. Even if the exact mechanisms behind parental influence vary in different contexts, most analyses of socioeconomic reproduction and mobility assume that parents matter for their children's outcomes, in both historical contexts and contemporary ones.

We analyzed the effect of parental death on socioeconomic attainment and mobility of children in Sweden in the first half of the twentieth century—a historical context in which more than 10% of children lost a parent before age 20, and which still lacked a fully developed redistributive welfare state that could compensate for the loss. Intergenerational transmission of occupation was important, and access to higher education was limited and depended to a great extent on class origin. In this context, we expected to find effects of parental loss on socioeconomic attainment and mobility.

While our findings offered some support for these expectations, it was neither strong nor very consistent. We found that losing a mother, especially at an early age, led to worse socioeconomic outcomes in adulthood. These effects were largely independent of place of residence, socioeconomic origin, and basic demographic characteristics of the parents, as well as whether the father remarried. Regarding the latter variable, however, we did not have information on when remarriage took place, which means that the negligible impact could have been due to a late remarriage, even after the child left home. The patterns were similar for sons and daughters.

Overall, the estimated magnitudes were small. Experiencing the death of a mother before age eight lowered occupational attainment by, on average, less than one HISCAM score for sons (mean=59.0; SD=10.4) and a bit more for daughters

(mean = 57.9; SD = 11.5), and it lowered the chances of attaining white-collar status by about 3–5 percentage points for sons and slightly more for daughters. Similarly, the effect on upward social mobility was a decreased probability of around three percentage points for sons, and an increased probability of about the same magnitude for downward mobility.

The sibling fixed-effects models showed weaker effects of maternal death on children's socioeconomic outcomes in adulthood, except for low-status attainment and downward social mobility. A limitation with the sibling models is that identification of the causal effect rests on a subset of the sample in which siblings experienced parental death at different ages, but where it is difficult to rule out that other differences between the siblings than the age at maternal death could have an impact on the results. We therefore evaluated the causal interpretation of the effects using a comparison of the effects of maternal death during the 1918–1919 influenza pandemic with effects of nonpandemic deaths. This comparison showed that estimates of pandemic and nonpandemic deaths were similar, or in some cases that the effects of pandemic deaths were even larger than nonpandemic deaths, which is not what we would expect if there were strong endogeneity bias in the nonpandemic estimates. Mortality during the pandemic did not exhibit a class gradient, and there is no reason to believe these deaths were endogenous regarding children's adulthood socioeconomic attainment. Hence, this comparison suggests that the association between maternal death and child socioeconomic outcomes in adulthood reflected a causal impact, even if this impact was modest.

For paternal death, we found no consistent evidence that it affected the socioeconomic attainment of sons or daughters in any important way. Similar findings have been reported for the Netherlands (1850–1952), where there was also a clear association between maternal death and socioeconomic outcomes in adulthood for both sons and daughters, but no consistent relationship for paternal deaths (Rosenbaum-Feldbrügge 2019). Together, these findings point to mothers being more important than fathers for children's achievement historically, even if the impact was by no means large. Our results are also broadly in line with some findings from contemporary Western countries, where consistent evidence for an important effect of parental death on socioeconomic attainment of children in adulthood was not seen (e.g., Biblarz and Gottainer 2000; Corak 2001; Lang and Zagorsky 2001).

That a mother's death might have had more of a negative effect than a father's death could possibly be explained by the importance of early investments in children and the formation of a child's personality during the formative years, before the start of formal schooling and increased interaction with other members of society (Rostila and Saarela 2011). In a context such as early twentieth-century Sweden, where the mother had the main responsibility for these early investments, it is likely that mothers would have been of particular importance for child development, and hence losing a mother at an early age would have had negative effects on child development and later-life socioeconomic outcomes. The impact could also reflect negative effects of emotional stress on achievement, particularly felt after maternal death.

From a theoretical point of view, the relative unimportance of paternal death is surprising. Our results seem to indicate that the role of resources and networks, as well as the role of the biological father in the socialization of young males, was not crucial for sons' socioeconomic development in adulthood. The reason for this could

be that other members of the family or kin network, such as grandfathers, uncles, or older brothers, stepped in as a response to the death of the father and assumed some of these paternal roles. ∎

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