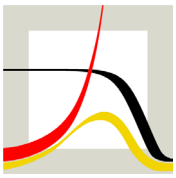

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Socioeconomic variation in child educational and socioeconomic attainment after parental death in Sweden

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Socioeconomic variation in child educational and socioeconomic attainment after parental death in Sweden

Kieron Barclay[†] [1,2,3] and Martin Hällsten[‡] [3]

Abstract

In this study we use Swedish population register data to examine whether parental death differentially affects educational and occupational attainment according to the socioeconomic status of the parent who dies, and the socioeconomic status of the surviving parent and extended kin. That is, we examine whether parental death has an equalizing or exacerbating effect on offspring socioeconomic attainment, and also whether the socioeconomic status of the rest of the family plays a meaningful role in compensating for parental death. Using data on cohorts born 1973 to 1982 we examine five different outcomes, which are grade point average (GPA) at age 16 in high school, the transition from lower to upper-secondary education, the transition to tertiary education, overall educational attainment, and occupational status by age 30. We match families based upon antemortem parental socioeconomic trajectories. Overall we find mixed results in our between-family regression analyses adjusting for observables, with inconsistent evidence suggesting that losing a parent with very high socioeconomic resources is worse, and some evidence for a protective effect if the socioeconomic resources of the surviving parent and extended family members are at the top of the distribution. Using sibling fixed effects models that adjust for unobservable factors shared within the family, we see zero results for moderation by parents' SES, but find consistent evidence that it is worse to lose a father at a younger age if grandparents have higher ranked occupations. We discuss possible interpretations of our findings.

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Introduction

Recent years have witnessed a surge of interest in the potential compensatory role that socioeconomic resources can play in moderating the negative effects of adverse life events (Erola and Kilpi-Jakonen, 2017), such as parental divorce or parental death. The potential role of socioeconomic resources in compensating for disadvantage is only one part of a much broader research landscape concerning processes of social mobility and social stratification. Socioeconomic resources in the family of origin are demonstrably extremely important for shaping the life course trajectories that individuals follow, including the type and level of education that individuals will achieve (Breen, 2010; Triventi, 2011), the occupations and social class they will settle into in adulthood (Erikson and Goldthorpe, 1992; Jonsson et al. 2009; Bloome 2017), as well as their long-term health and lifespan (Elo and Preston, 1992). Studying the potential moderating role of socioeconomic status in response to adverse life events has the potential to be particularly insightful because it allows us to understand whether and how levels of resources enable different social groups to respond to acute setbacks differently, but also whether the transmission of advantage is dependent on exposure to parental resources, or if this transmission takes other forms.

Producing clear answers about how parental socioeconomic resources may or may not compensate for adverse experiences can be difficult due to complex endogenous processes related to who experiences an adverse event, and how they are able to respond to it. Previous research has consistently and extensively documented the clear negative *main effect* of parental loss, through either divorce or death, on the attainment of children (for reviews see McLanahan and Percheski 2008; McLanahan et al., 2013). We therefore focus upon a related question that has received much less attention in the literature, namely the moderating role of socioeconomic status in this process. We ask: (1) is it worse to lose a parent with high levels of socioeconomic resources than low levels of socioeconomic resources; and (2) do the socioeconomic resources of your surviving family members, including extended kin, play any meaningful role in moderating the negative effect of parental loss on achievement and attainment. Only a handful of studies have previously examined socioeconomic variation in child outcomes following parental divorce (see Biblarz and Raftery, 1993; Albertini and Dronkers, 2009;

Martin, 2012; Bernardi and Radl, 2014; Mandemakers and Kalmijn, 2014; Grätz, 2015; Kalmijn, 2015; Bernardi and Boertien, 2017), and even fewer studies have examined this in relation to parental death (Kalil et al., 2016; Prix and Erola, 2017, but also see Kailaheimo and Erola 2016).

In this study, we extend previous research on SES differentials in the effects of parental death on offspring attainment in several ways. First, we separately examine the effects of maternal death versus paternal death. Previous research has focused on paternal death, presumably due to small cell sizes, but we are not constrained by such issues when using the Swedish population data. Furthermore, the effects of maternal death might differ in meaningful ways from the death of the father, with subsequent consequences for how socioeconomic status is able to compensate for parental loss or not (Adda, Björklund and Holmlund, 2011). We also examine a wide range of different outcomes, including high school GPA, dichotomous outcomes related to educational transitions, as well as long-term educational attainment and occupational status by age 30. Given that previous research has separately examined a diverse group of outcome measures ranging from reading and mathematics test scores during adolescence, to educational transitions, to overall attainment, with limited comparison across outcomes, our study will shed light on whether the choice of outcome variable has any meaningful effect on the measurement of loss and compensation processes. This is important because parental death may have acute effects that are distinct from long-term effects. We further extend this research by examining the potential compensating role of extended kin, such as aunts, uncles, and grandparents. Finally, we also extend research on this topic by using a sophisticated research design, implementing a matching-based analysis to identify the correct time-point for measuring SES in order to reduce confounding from factors jointly related to parental SES, parental death, as well as child attainment. This is a particular problem in previous research, and may explain the inconsistencies previously documented in SES differences in loss and compensation processes. Finally, we contrast the results from these between-family analyses with estimates from a sibling fixed effects estimator that has its own strengths conditional on a set of assumptions.

Previous Research on Socioeconomic Variation in Child Outcomes Following Parental Loss

Recent years have seen the emergence of a growing body of research that attempts to understand the extent to which the effects of parental loss vary by parental SES. Given that the role of parental SES in both loss and compensation processes is likely to vary according to the national welfare context as well as localised cultural dynamics in regards to how family and kin systems work (Bernardi and Boertien, 2017), we make efforts to note the countries where this previous research has been conducted. To our knowledge, two studies have examined socioeconomic variation in child outcomes following parental death. Kalil et al. (2016), applying a fixed effects approach to data from Norway to study child educational attainment, found that the marginal effect of losing a father is greater at higher levels of paternal education, while the educational level of the surviving mother did not exert a statistically significant effect. Prix and Erola (2017), examining the effects of parental death in Finland, found that high levels of education amongst mothers did successfully compensate for the death of the father for educational transitions to upper-secondary education and tertiary vocational education, but not for the transition to university education.

The literature examining socioeconomic variation in response to parental loss from divorce is much larger, but has produced mixed findings. Most recent research examining compensation differences in response to parental divorce has found that the children of parents with high levels of education or socioeconomic resources do not suffer negative effects, while those whose parents have lower socioeconomic resources do. This has been documented using data from Germany (Grätz, 2015), the UK (Mandemakers and Kalmijn, 2014), the Netherlands (Kalmijn, 2015), and Italy (Albertini and Dronkers, 2009). Other research, however, has documented an 'equalizing effect' of parental separation, where children of highly educated or high SES parent suffer more from parental divorce. For example, Bernardi and Radl (2014), using data on 14 countries (not including Sweden) from the *Gender and Generations Survey* and examining likelihood of attaining a tertiary degree as the outcome, found that children of higher educated parents suffer relatively less from divorce in countries with academic streaming and school stratification, but not in countries with a comprehensive education system, presumably because there is no compensatory effect of the school environment in the latter. An equalizing effect of parental divorce has also been reported for Finland

(Erola and Jalovaara, 2017), and the United States (Biblarz and Raftery, 1993; McLanahan and Sandefur, 1994; Martin, 2012). However, we hesitate to generalize the findings from the literature focusing on parental loss from divorce to parental loss from death given the important differences between these two types of events.

Theoretical Explanations and Socioeconomic Variation

An examination of socioeconomic variation in child outcomes following parental death requires an engagement with several related literatures. One is the literature on how family structure affects child outcomes. Parental death leaves the surviving parent as a single parent, and may induce a period where family life is characterised by instability and complexity as the surviving parent tries to cope alone, or rebuild his or her life with a new partner who may or may not bring stepchildren into the new household. The empirical literature shows that family structure, instability, and complexity each exert an independent effect on child outcomes (Thomson, Hanson and McLanahan 1994; Thomson and McLanahan 2012; Jackson, Kiernan and McLanahan 2017). A second important literature is the direct effect of grief attributable to parental loss on child outcomes, since studies have shown that parental loss increases the risk of depression, self-harm, and suicide for the child (Rostila and Saarela, 2011; Berg et al., 2016; Rostila et al., 2016), as well as trauma for the surviving parents (Shor et al., 2012). Finally, questions about how child outcomes are related to the education and socioeconomic status of the deceased and surviving parents speaks directly to the literature on the transmission of human capital from parents to children (Laband and Lentz, 1983; Jonsson et al., 2009; Holmlund, Lindahl and Plug, 2011). Although each of these three perspectives are important for explaining the *direct* effect of parental loss on child outcomes, each is also relevant for understanding *socioeconomic variation* in response to parental loss.

Family Structure, Instability, and Complexity

Since the 1980s a large literature has grown demonstrating that family structure is related to child outcomes, and this has been observed consistently across a wide variety of institutional contexts (Chapple, 2009; Låftman, 2010). The presence or absence of a

partner, as well as other dimensions of household composition, condition the time and money that parents can direct to their children (Thomson, Hanson and McLanahan, 1994; McLanahan and Percheski, 2008). Research suggests that lower levels of economic resources are the key factor behind the disadvantage of children with single mothers, though dilution of parental time and attention also play an important role (Thomson, Hanson and McLanahan, 1994). In recent years scholars have shown that family instability, meaning regular changes to family structure, has an independent negative effect on child outcomes, and that greater family complexity also reduces the educational attainment of children (McLanahan and Percheski, 2008). Family instability means that children face greater competition from factors such as work, partner search, and stepsiblings for the time and resources that parents might otherwise have devoted to them. We argue that parental death can be seen as a trigger for family instability and complexity as the bereaved parent attempts to put his or her life back together. This perspective is complicated by the possibility that parental attention diverted towards work and partner search may be detrimental for the children in the short-term, but beneficial in the long-term if it results in a greater parental happiness.

An important nuance found in the family structure literature is the degree to which parental education can moderate the negative effects of non-optimal family structure. This literature has consistently shown that higher levels of maternal education can compensate for single motherhood (Beck et al., 2010; Augustine, 2014). Studies suggest that the protective effects of higher levels of maternal education can be attributed to parenting style, where highly educated mothers are better able to stimulate the development of human capital in their children than are mothers with lower levels of education (Kalil, Ryan and Corey, 2012). This is important for understanding potential socioeconomic variation in child outcomes following parental death, as a surviving parent with high levels of education or socioeconomic status should be able to limit the negative impacts of parental death on his or her children, though this may vary according to whether the surviving parent is the mother or the father. Since parental death is more common amongst families that already experience multidimensional forms of disadvantage, this should lead to wider socioeconomic disparities in a macro-perspective. In this study we also examine whether the education and socioeconomic status of extended kin such as aunts, uncles, and grandparents have a compensating

effect against parental death, reducing the negative impacts on child educational and socioeconomic attainment.

Trauma and Grief

The trauma and upheaval caused by parental death may have both short- and long-term consequences for both the child and the surviving parent. In Sweden parental death has been shown to have a negative effect on school grades and increase the risk of dropping out of school (Berg et al., 2014). Furthermore, parental death is associated with an increased risk of depression and self-harm, and even an increased risk of mortality for the children (Rostila and Saarela, 2011; Berg et al. 2016; Rostila et al., 2016). The death of a partner is naturally also a critical event for the surviving parent, who is also subject to an increased risk of depression and mortality (Umberson, Wortman and Kessler, 1992; Shor et al., 2012). It is very possible that part of the negative effect of parental death on child outcomes flows through the effect on the surviving parent, as this traumatic event could lead to changes to parenting style and the relationship with the child. As a consequence, it is possible that the negative effects of parental loss stemming from grief overwhelm the potential compensatory socioeconomic resources of surviving family members even if they are abundant. We might therefore anticipate that if grief is the main mechanism for the effect of parental death on child educational and socioeconomic attainment, the negative effects of parental death should be neutral in regards to the socioeconomic status and education of the parent who died. On the other hand it is still possible that the socioeconomic resources of the surviving kin are important in compensating for that loss, as more highly educated and higher SES kin might be more likely to understand the kind of support that both the child and the surviving parent would need, and how to ensure that they received that support.

Intergenerational Human Capital Transmission

Parental death may also affect the educational and socioeconomic attainment of children by interrupting the intergenerational transmission of human capital from the deceased parent. Parental death interrupts the transmission of interaction styles that are differentially rewarded by educational institutions, knowledge about navigating and

succeeding in the educational system, and attitudes and expectations surrounding educational engagement and educational ambition (Bourdieu and Passeron, 1990; Lareau, 2011). Parental death would also interrupt the transmission of specific skills that facilitate occupational and class reproduction (Jonsson et al., 2009; Adda et al., 2011). Parental social capital, conceptualised as a network of social ties and the resources available through those ties, also plays an important role in socioeconomic attainment; social networks of both the parent and child may moderate the transmission of information about educational opportunities as well as information about how to take advantage of those opportunities. The interruption of this human capital transmission suggests that losing a parent with a higher level of education, more money, and higher status social networks would constitute a greater loss of experience, advice, and future opportunities for a child than the loss of a parent without those resources (Jonsson and Gähler, 1997). Likewise, the education, money, and social capital of the surviving parent and extended kin should play an important role in filling in for the loss of the deceased parent if this mechanism is important, as the literature on the potential compensatory role of parental education for limiting the negative impacts of non-optimal family structure has suggested (e.g. Augustine 2014).

However, given that the literature also reports null findings, it is worth considering potential arguments for why socioeconomic variation might be limited. For example, transmission of advantage may not be dependent on actual exposure to parents if the deceased parent became an enduring role model that could be invoked by the surviving family members, if the dying parent had created a persistent normative environment that was kept intact after his or her death, or if genetic transmission of underlying advantage plays an important role in educational attainment (Okbay et al., 2016). Mechanisms such as these would limit the impact of the death itself, and thus also any socioeconomic variation in the effects of parental death on child outcomes. For example, if the role model effect of a high SES parent persists, the loss of a high SES parent will not have a larger impact than losing a lower SES parent. Research on the effects of grandparents on children's outcomes suggest that these may be independent of physical exposure to the grandparents since they are not dependent on actual overlap in generations or on physical proximity (Anderson, Sheppard and Monden 2018).

Analytical Strategy

A key concern for researchers trying to understand the relative importance of the socioeconomic resources of the dying and surviving parents is selection. It is very plausible that there is a common predictor of parental socioeconomic status, parental death, and also the educational and occupational achievements of the child. For example, underlying parental health, or propensity to engage in risk behaviors such as smoking, which are clearly linked to the SES and risk of death for the parent, could also be linked to the child's educational attainment through socialization processes in the household, or some underlying genetic component (McLanahan et al., 2013).

In order to address this, some studies use various types of fixed effects methods. While these are powerful, they also carry specific limitations and risks. First, with individual fixed effects models, one can only study short-term effects (i.e., a before-after estimator, Amato and Anthony 2014). Second, with standard sibling fixed effects, what identifies the effect is the age difference between siblings. This means that the difference in children's age at the time of parental death is perfectly collinear with children's birth years. With sibling fixed effects, the effect of parental death will be confounded with cohort trends that happen to be specific to families experiencing parental death, but also generic cohort trends.

Another concern is that in order to address compensation, we must rely on observed parental SES in order to identify the heterogeneous effects. This is an underappreciated problem because, if one focuses on parental death before the child turns 16, most parents will themselves be relatively young, and are unlikely to have reached their peak socioeconomic status. As a result, we are typically only able to observe parental SES at a relatively early point on the parents' attainment trajectory, creating a distorted view of their SES potential. This also denies us the possibility to average parental characteristics to get closer to their latent or permanent social status (Solon 1992). More importantly, we will typically observe that parents who have died have a lower SES than those who did not die, which may confound the attempts to identify how important the SES of the dying parent is for the child's outcomes. This problem has been noted in previous research, for example by Prix and Erola (2017), but their solution was limited to

checking for non-linear associations. This is complicated further by the additional dimension that couples tend to pair off homophilously (McPherson et al., 2001), and therefore whatever underlying factor was associated with parental SES, parental death, as well as offspring educational attainment may persist in the household with the surviving parent. Another concern is that the SES measurement itself is endogenous to parental death, for example, that the death was preceded by ill health, limiting career and education investments as well as outcomes. This negative feedback loop where death causes (lower) SES is hard to mitigate. An extreme version of this potential problem is that the poor health of the dying parent would also limit the SES of the non-dying parent, and cause distress and negative effects for the whole nuclear family.

Our strategy to address compensation effects is based on three approaches: a) standard between-family regressions with adjustment for observables where we match families based upon parental socioeconomic trajectories prior to death in order to get rid of endogenous measurement time-points for SES; b) we look for compensation outside the nuclear family, such as compensation by grandparents and aunts or uncles; and c) using sibling fixed effects augmented with a correction for cohort drift, as applied by Kalil et al (2016).

Antemortem Socioeconomic Trajectory Matching

In order to handle endogenous measurement of SES, we use a pre-matching technique, where each dying parent for a certain year (of death) is matched to non-dying individuals with similar characteristics. We run this for separate years, and use this information to define the time-point for SES measurement in the control group. We measure SES in the preceding year both for dying and non-dying parents.[4] The dependence of SES on age may also cause later dying parents to have reached higher SES than younger dying parents. Any interaction between SES and parental death may to some degree be age in disguise. Controlling for age of death is not viable since this is undefined for the control group. However, our matching strategy allows for explicit

[4] An alternative would be to use measure SES before or at childbirth. However, this will delimit the sample to slightly older parents, since some young parents might would still miss information e.g., income of occupation, or in some cases even education.

control of age of SES measurement (i.e., for each cluster of matched treated and control cases). Since the matching procedure secures that treatment and control are balanced in age, controlling for age of measurement will also not eschew the estimation of the effect of parental death itself.

Once we have the SES measure in place, our standard setup is to estimate the effect of parental death conditional on the SES of the dying and surviving parent, and then interact parental death with these two types of SES.

Compensation by the Extended Family

Another strategy to handle endogeneous SES measurement is to focus on compensation by the extended family. We can be more confident in assuming that these extended kin are relatively unaffected by any endogeneity related to the dying parent. However, since these compensatory resources would be a further degree of separation away, one would also tend to expect weaker compensatory effects.

Sibling Fixed Effects with Adjustment for Cohort Drift

Although fixed effects models have been applied in previous research in order to attempt to identify the effect of parental death and divorce on offspring outcomes, the problem with the fixed effects specification in the context of this particular study is that the within-sibling demeaning that is central to the fixed effects calculations causes age at parental death differences across siblings to be collinear with the difference in birth years. This is a serious problem as differences between siblings in the age at parental death will capture and reflect period trends in educational expansion, or grade inflation, for example.

Kalil et al (2016) offer a tractable alternative specification. In their sibling fixed effects model, they enter two terms that capture differences in birth years/age between siblings: relative age and age at death. These are collinear for children that experience parental death. However, in their approach, they also include families that do not experience death, and this group will contribute only to the relative age parameter (and

due to sample size differences across groups, will also strongly drive this effect). The age difference at death is thus estimated conditional on the overall sibling age difference effects in the population. The effect of relative age is expected to be negative, since earlier-born siblings will miss opportunities linked to educational expansion, skill upgrading, or real income growth. The effect of age at parental death is expected to be positive, as earlier-born sibs will have had greater exposure to their parent relative to later-born siblings. Note that we also control for child birth order. The approach of Kalil et al. is potentially very power demanding since they interact both relative age and age at death with (fathers) SES, allowing for compensation effects but also SES specific drift in the outcome.[5]

Data

We use population data for Sweden up until year 2012, the latest point for which we have data. Age 30 is approximately the earliest age that one can claim to measure long-term effects of childhood events. We therefore define the birth cohorts to be born 1973 to 1982 so that we can measure outcomes at age 30 for 10 full birth cohorts. We measure two long-term outcomes: education (in years of highest completed) and occupation (in ISEI scores) based on the population-wide education register and the occupation register (based mainly on employers reports of employees ISCO-88) at age 30 between 2003 and 2012. We also measure GPA at graduation from elementary school, graduation from upper-secondary school, and entry into and graduation from tertiary level education as a series of shorter- and medium-term outcomes. We define the educational transitions as leaving the level with the relevant educational credential (i.e., not just entering). These three measures of educational transitions use school registers on graduates from elementary schools at age 16, upper-secondary schools at age 18/19, and graduation from tertiary education. These data are available for our entire sample (and start in 1988, 1972 and 1960, respectively).

[5] They do not discuss the timing of SES measurement in detail, and the timing of measurement seems to be eclectic, which allows them to maximize sample size. Again, this comes at the cost of measurement precision.

We measure parental death as any recorded death between the year of the 1st birthday and the year of the 16th birthday of the child (the underlying data comes both from the tax authority and cause-of-death hospital register). We omit deaths in the first year of life (or for fathers, before birth). In the between-family regression analyses where age of measurement is defined using matching techniques, we omit individuals whose parents died between the years of their 17th and 32nd birthdays in order to provide a cleaner control group.

Matching Algorithm for SES by Parental Age

In order to measure SES at an age that is uninfluenced by parental death, we match parents on observed characteristics to determine the year at which we make the measurement. We use birth year, gender, education and social class measured in the year prior to death as exact matching covariates, and then choose the nearest neighbors based on mahalanobis distances in disposable income rank in the three preceding years to the death (Kantor 2006). This means that we can match on income trajectory, which to some extent should help to reduce the endogeneity bias. After some experimentation, we decided to match each dying parent to up to 45 controls in the first step. The controls were not necessarily unique, however, and we dropped non-unique matches.[6] Some cell sizes were also very small and did not allow for anything near 45 matches. For these cells, common support is very limited, and we dropped any cell where we could not match dying parents to at least two controls. After these operations, the relation was around 1:30.

SES Measures

The SES measures are matched to each parent using the matched year. For parents, we measure their SES as their occupation, coded to the ISEI scale (Ganzeboom and Treiman 1992). We get the occupation information from quintennial censuses (1960-1990) and from the occupation registers (2001-). We can measure occupation only in 1960, 1970

[6] Through our model specification search, we realized that the identification of interactions in our case has extreme power demands. With a lower number of matched controls per dying parent for the time-point of SES measurement, i.e., a smaller sample size, we get essentially the same results but with wider standard errors.

and then every fifth year until 1990. For every matched SES measurement time-point , we will use the previously known occupation as the measure.

In supplementary analyses (see Web appendix), we also measure their education in censuses and income in tax registers. These measures produce similar, but weaker, findings. Our choice of occupation is motivated by some specific limitations in the data on education and income that we have access to. For education, a problem is that any cumulative measure of highest attained education is missing from the censuses between 1970 and 1985. In between these time points, we only have information on graduation from upper-secondary school (1972-) and tertiary education (1960-) from within Sweden. Education from abroad and other types of schooling will be missing. From 1985, with the establishment of the education register, we have good annual information with very high precision, but this is will be very late for parental deaths that may start in 1974. We are thus forced to work with a crude education measurement.

For income, the tax records goes back to 1968, which means that we can use averages of income in the five years prior to death to reduce year-to-year measurement error (Solon 1992). This is, however, a limited time-period, and so much measurement error will still prevail. In comparison, occupation is a more stable measure that is less subject to year-to-year variations, and is therefore often used to proxy (or instrument) for income (Björklund and Jäntti 1997). Compared to education, our occupation measure also has high precision throughout our study period.

For aunts/uncles and grandparents, we first measure their individual highest observed education and occupation in life, and their average lifetime income (measured from 1968 to 2012). We then average across all aunts/uncles, and grandparents. The average is a more realistic measure than taking the highest value across the extended family, since the latter reflects more heterogeneity (Thaning and Hällsten 2018). Since aunts, uncles and grandparents are only indirectly affected by their siblings or children's death, we see no reason to focus on a specific age at measurement, not least since previous research suggests that generational overlap does not seem to matter (Andersson, Sheppard and Monden 2018).

Results

Descriptive Statistics

Table 1 provides descriptive information on the sample used in our analyses, focusing on the child's generation. Note that this is the matched sample. As can be seen, 3.2% of our sample lost a father to death before age 16, while only 1.2% lost their mother to death before age 16. It should be noted that these numbers are higher than in the reference population due to our matching strategy. In the population, around 3 percent of children lose any of their parents up to age 16 (see Table A1).

*** Table 1 ***

Between-family Comparisons Adjusting for Observables

Parental Socioeconomic Resources

The results from our between-family comparison analyses are shown in Table 2. The table shows the estimates from models focusing on paternal death as well as maternal death, for each of the six different outcomes that we study amongst the children: educational attainment at age 30 in years, occupational attainment at age 30 measured as an ISEI score, high school GPA at age 16, and three educational transitions: graduation from upper-secondary education, entering tertiary education, and graduating from tertiary education.

Table 2 shows the results from models examining how the negative effects of parental death are related to parental occupational attainment, and how the occupational quartile of the surviving parent may or may not moderate the negative effects of the death of the other parent. The specification includes a main effect of parental death, and its interaction with parental ISEI quartiles, with the lowest quartile as the reference group. As can be seen, the main effect of parental death, whether it is the mother or

father, is clearly negative on all measures of children's educational and occupational attainment (note that the main effect here refers to parents in the lowest of quintile groups, but even without interactions, the main effect is negative; not shown). When we focus on the occupational quartile of the parent who died, we can see that losing a father with occupational status in the third quartile reinforces the negative effect of parental death on educational and occupational attainment at age 30. We also see some similar evidence for entering tertiary education, but this effect does not stay on through tertiary graduation. We see no other significant differences across SES quartiles for father's death. We can also see some tendencies of compensation by the surviving mother's SES. The interactions are generally positive, and some of them are also significant, i.e., for GPA and having any upper-secondary education, where the negative effect of parental death is reduced in the third (and in one case also the fourth) quartile.

For mother's death, we can observe a similar reinforcing effect for mothers in the third quartile of SEI for children's occupational attainment and entry into tertiary education, and one case of compensation from the surviving father for having any upper-secondary education. To sum up our results, we find only marginal evidence that the effect of parental death varies by either of the parents' SES. There are some weak indications that it is worse to lose a high SES parent, and that having a high SES surviving parent can compensate, but this is found only for very few outcomes, and the pattern does not form any clear gradient.

*** Table 2 ***

Socioeconomic Resources of Aunts, Uncles, and Grandparents,

In Table 2, we examine whether the socioeconomic resources of extended kin in the form of aunts and uncles plays any moderating role in compensating for the death of a mother or father. Our results strongly suggest there is no moderation. Across both father's and mother's death, we have two significantly positive interaction coefficients, and one negative; the rest is not significant. In Table 3, we run the same analyses but for

grandparents. Again, we find no evidence of moderation. We have one significant and one negative interaction coefficient, with the rest non-significant. In both of the tables, when we examine patterns in the interaction across the quartiles, there is little evidence of any gradient. In all of these analyses shown across Tables 2 through 4, we use around half a million cases, and so power and type II errors should not be the explanation of these results.[7]

*** Tables 3 and 4 ***

Within-family Comparisons Adjusting for Unobservables

Parental Socioeconomic Resources

We follow our between-family comparisons with the application of sibling fixed effects models following the specification of Kalil et al (2016). In essence, these models contain an interaction for parent's age at death with parents' SES, where parents age at death has been set to an ad hoc number for those children that do not experience this (the within difference used for estimation will thus equal 0), and with children's birth year * parents' SES as a very important control that is valid for all children. In these analyses our key focus is upon how timing of parental death affects the period of exposure to mothers and fathers with varying levels of education, occupational status, and income. Table 5 shows the results from models for father's death. First, the age of the death of the father, for the lowest reference quartile, has no impact on children's outcomes. Second, we find no evidence of moderation: none of the interaction coefficients are significant. In Table 6 we run the same analyses but for mother's death, and the results are very similar.

[7] These zero results are also found with parents' education and (five year averaged) income (see Tables S1 and S8).

*** Tables 5 and 6 ***

Socioeconomic Resources of Aunts, Uncles, and Grandparents

In Table 7, we focus on the role of aunts and uncles with the interaction of father's or mother's age at death with the average SES among aunt/uncles, coded into quartiles. It should be noted that these models also controls for mother's and father's SES * parent age at death as in Tables 5 and 6 (and of course, the control term children's birth year * parents' SES). For age at father's death in the upper panel, we find that those children that have aunts/uncles in the third (and in one case fourth) quartile have higher GPA, higher upper-secondary graduation rates, and higher level of tertiary entry (and graduation). These coefficients show significant but small effects. For example, five more years of exposure to one's father leads to 0.02 (0.004*5) higher GPA rank, or 2.5 percentage points higher upper secondary graduation rates if you have aunt/uncle's in the third instead of the first quartile of occupation. The strongest effect is found for entry and graduation from tertiary education, where 5 years exposure gives 3.5 and 4 percentage point's higher rates if you have more privileged aunt/uncles. This means that if you have aunt/uncles with low SES, the length of exposure to the father who later dies does not matter much, whereas among the more privileged, exposure is more important. This suggests that the negative effect is stronger in high SES families, i.e., parental death has an equalizing effect on educational and occupational achievement and attainment. For mothers, we find no significant moderation.

*** Tables 7 and 8 ***

In Table 8, we analyze the role grandparents with the same setup. For fathers, we find very consistent evidence that having grandparent in the third and fourth quartile of occupational ISEI is associated with better outcomes the longer the exposure to one's father. We find significant interaction for all outcomes for the fourth quartile of grandparents ISEI, and for all but one interaction in the third quartile. The effect size are

slightly stronger: a five year difference in exposure leads to 2.5 percentiles higher education, 5 percentage points higher graduation rates from upper-secondary schools, and 4.5 percentage points differences in tertiary graduation rates, to give some examples. Again, for children in the first or second quartile, there is no effect of exposure, which suggests a negative effect that is limited to high SES families. For mothers, we find little evidence, only one interaction coefficient is significant, but goes in the same direction as for father's age of death. The absence of significant results for mother may be explained by power since we have less almost 2/3 fewer maternal deaths.[8]

Discussion

In this study we have examined whether parental death has an equalizing or exacerbating effect on socioeconomic differences in offspring attainment, and also whether the socioeconomic status of the rest of the family plays a meaningful role in compensating for parental death. Overall the results of our analyses suggest that neither the socioeconomic status of the deceased or surviving parent plays any important or consistent moderating role in regards to the educational and labor market outcomes of the children in Sweden. Although we find scattered evidence that suggests that it is worse to lose a father or mother who has a high level of education, occupational status, or income rather than a low level of any of these three attributes, these patterns are not consistent across the various educational and labor market outcomes that we study. Furthermore, we do not observe any consistent gradient where it is steadily worse to lose an increasingly high SES parent, or monotonically more advantageous to have a surviving parent with higher levels of SES. This conclusion that the socioeconomic status of the parents, either deceased or surviving, plays little role in moderating offspring educational and occupational outcomes holds across both our between- and within-family comparison based results. It is possible that the reason why we fail to find any evidence for moderating effects by parental SES is because it is so difficult to calculate a

[8] When we examine models with aunt/uncle's and grandparents' education and (permanent) income, we find no effects for education and similar effects for income (see Tables S2, S3, S6, S7, S9, S10, S13 and S14)

value for parental socioeconomic status when mothers or fathers die at a young age. Even after adjusting for age at measurement, much of the important variance will remain hidden for those parents that die. It is perhaps impossible to measure the socioeconomic status of this group at any higher level of precision. However, this issue is endemic to any study of this research question rather than one that applies only to this particular study. Even the fixed effects study design cannot deal with this unobservable problem, because deceased mothers and fathers are not necessarily assigned to the correct quartile of socioeconomic status for the interaction analyses.

Regarding our analyses of the potential compensatory role of the socioeconomic resources of the extended kin, the results are mixed. The results from our between-family comparisons do not suggest that the socioeconomic status of aunts/uncles, or grandparents plays any moderating role. However, the results from our within-family analyses point towards the perplexing conclusion that suffering the death of a father is worse if your aunts, uncles, and grandparents have higher levels of socioeconomic status. One way of explaining this pattern is that the measures of socioeconomic status that we have of aunts and uncles, and grandparents is a more accurate reflection of parental socioeconomic status than the early life measure that we have of parental SES prior to death. That is, grandparental SES is parental SES in disguise, capturing the eventual socioeconomic status potential of the parent with less measurement error than the measure that we can derive directly from the deceased parent him or herself. This same logic applies to the socioeconomic status of aunts and uncles, though this should have larger measurement error than the SES of the grandparents. If the socioeconomic status of extended kin can indeed be considered a more accurate proxy for precluded parental socioeconomic status attainment, then our analyses of extended kin would point towards the conclusion that parental death has an equalizing effect on offspring educational and labor market attainment; that is, it is worse to lose a high SES father than it is to lose a lower SES father.

Our findings contribute to a literature that has produced mixed findings on how the socioeconomic status of parents moderates parental loss. A number of previous studies examining SES differentials in the effects of parental divorce have found that the negative consequences are greater for children who have a low SES parent than for

children who have a high SES parent (e.g. Albertini and Dronkers, 2009; Mandemakers and Kalmijn, 2014; Grätz, 2015; Kalmijn, 2015). However, other work has observed an equalizing effect of parent divorce more similar to what we observe in this study (e.g. Biblarz and Raftery, 1993; McLanahan and Sandefur, 1994; Martin, 2012; Bernardi and Radl, 2014; Erola and Jalovaara, 2017). The most comparable study to our own examined register data in order to measure SES differentials in the loss and compensation processes surrounding parental death in Finland (Prix and Erola, 2017). Prix and Erola (2017) found that high levels of education amongst mothers did successfully compensate for the death of the father for educational transitions to upper-secondary education and tertiary vocational education, but not for the transition to university education. Our analyses instead indicate that either parental SES does not play any moderating role following parental death, or that losing a higher SES parent has an equalizing effect on offspring attainment, if we can consider the SES of extended kin as a proxy for precluded parental socioeconomic attainment.

Excluding our results that suggest that the socioeconomic status of extended kin may serve as a proxy for parental SES, the fact that we only observe small and inconsistent socioeconomic differences in the long-term impact of parental death may depend on several mechanisms. First, parental death may only have a largely temporal grieving related effect. This should naturally attenuate over time. However, the consequences of grieving will in some cases, for example in terms of lower school grades, be permanent. In turn this may point to a second explanation: individuals may attempt to compensate for short-term losses themselves, without the support of parents. Following the same example, individuals with poor grades due to the shock of a parental death may realize this problem and attempt to complement their education. Compensatory agency could thus minimize the role of compensatory SES. This is also related to a third explanation, which is that the weak long-term effects may be contingent on the Swedish context of our study. One might anticipate that the observable effects of loss and compensation processes would be weakest in the Nordic context, where the SES of the parents is relatively less important than in the United States or the United Kingdom for offspring attainment, and where surviving family members may expect the state to pick up the slack in providing economic and financial support to the grieving family. Given the relatively high levels of support for single parents, and the highly subsidized educational

system without dead ends and with ample opportunities for re-education, one might expect parental loss to be less consequential in Sweden than in other contexts. A fourth potential explanation has to do with the control group. Over time, individuals are continuously exposed to further experiences, both good and bad. Even though the loss of a parent is very negative, the groups will become more similar over time as experience cumulate. This should then attenuate the main effect of parental death, which would also proportionally attenuate compensation effects. However, we still observe substantial negative long-term main effects of parental death, and to what extent our weak findings for compensation are due to the potential moderating aspect of the passage of time is difficult to evaluate.

In this study, we have extended previous research on SES differentials in the effects of parental death on offspring attainment in several ways, by examining the effects of both maternal and paternal death, by examining a wide range of different educational and occupational outcomes, by examining the potential moderating role of the socioeconomic resources of extended kin, and by implementing both an antemortem socioeconomic trajectory matching-based design that attempts to take care of selection processes related to who experiences parental death and when, as well as a sibling fixed effects approach. Ultimately, producing simple answers to the research questions that we address in this study is challenging, because the questions themselves cannot be readily addressed using standard causal identification strategies. Instead, we try to provide a broad picture of how socioeconomic resources moderate the loss of a parent to death, and how socioeconomic resources have the potential to compensate for parental loss. As we have discussed, the role of socioeconomic resources in loss and compensation processes in relation to the effects of parental death on offspring attainment in Sweden is far from clear, but points towards either a null effect or an equalizing effect on child educational and labor market outcomes.

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Table 1. Descriptives for Age-Matched Sample.

	mean	(SD)	Min	Max	Valid cases
Birth year	1977.14	(2.90)	1973	1,982.00	566,661
Female	0.49	(0.50)	0	1	566,661
Birth order	1.74	(0.88)	1	16	566,661
Number of sibs	2.41	(1.06)	1	18	566,661
Father dies age 1-16 [a]	0.031	(0.17)	0	1	566,661
Mother dies age 1-16 [a]	0.012	(0.11)	0	1	566,661
Child's age at father's death [b]	24.67	(8.94)	1	39	38,559
Child's age at mother's death [b]	24.95	(8.69)	1	39	18,444
Outcomes					
Education, years (age 30)	12.95	(2.10)	6	19	566,661
Occupation, ISEI (age 30)	44.06	(16.94)	16	88	529,472
GPA rank, 9th grade (age 16) [c]	0.5	(0.29)	0	1	552,390
Upper-secondary graduation (up to age ≈ 23)	0.83	(0.37)	0	1	566,661
Tertiary education, entry (no age limit)	0.49	(0.50)	0	1	566,661
Tertiary education, graduation (no age limit)	0.28	(0.45)	0	1	566,661
Parents' SES					
F: Elementary	0.38	(0.48)	0	1	566,661
F: Up. sec. (short)	0.16	(0.36)	0	1	566,661
F: Up. sec.	0.24	(0.43)	0	1	566,661
F: Postsec.	0.07	(0.25)	0	1	566,661
F: Tertiary	0.11	(0.31)	0	1	566,661
F: Missing	0.05	(0.21)	0	1	566,661
F: Occ (Q1)	0.24	(0.43)	0	1	566,661
F: Occ (Q2)	0.25	(0.43)	0	1	566,661
F: Occ (Q3)	0.26	(0.44)	0	1	566,661
F: Occ (Q4)	0.25	(0.44)	0	1	566,661
F: Inc (Q1)	0.24	(0.43)	0	1	566,661
F: Inc (Q2)	0.25	(0.43)	0	1	566,661
F: Inc (Q3)	0.25	(0.43)	0	1	566,661
F: Inc (Q4)	0.26	(0.44)	0	1	566,661
M: Elementary	0.34	(0.48)	0	1	566,661
M: Up. sec. (short)	0.23	(0.42)	0	1	566,661
M: Up. sec.	0.18	(0.39)	0	1	566,661
M: Postsec.	0.09	(0.28)	0	1	566,661
M: Tertiary	0.11	(0.31)	0	1	566,661
M: Missing	0.05	(0.23)	0	1	566,661
M: Occ (Q1)	0.14	(0.35)	0	1	566,661
M: Occ (Q2)	0.3	(0.46)	0	1	566,661
M: Occ (Q3)	0.22	(0.42)	0	1	566,661
M: Occ (Q4)	0.24	(0.43)	0	1	566,661
M: Occ missing	0.09	(0.29)	0	1	566,661
M: Inc (Q1)	0.25	(0.43)	0	1	566,661
M: Inc (Q2)	0.25	(0.43)	0	1	566,661
M: Inc (Q3)	0.25	(0.43)	0	1	566,661
M: Inc (Q4)	0.25	(0.43)	0	1	566,661

Note: [a] NB! these proportions refers to the matched sample, where children with dying parents are over-sampled; b valid cases refers children with experience of parental death at age 1 to 39 (missing will be replaced by ad hoc 0 in sibling fixed effects model), [c] parents dying in ages 15/16 are removed from valid cases to avoid short term effect.

Table 2. Between-family Analysis of Parents' Death by Parents' Occupation.

	Father dies						Mother dies					
	Education, years	Occupation, ISEI	GPA 9th grade, rank	Upper-secondary graduation	Tertiary, entry	Tertiary, graduation	Education, years	Occupation, ISEI	GPA 9th grade, rank	Upper-secondary graduation	Tertiary, entry	Tertiary, graduation
Father/Mother dies=1	-0.356***	-1.617***	-0.065***	-0.081***	-0.052***	-0.047***	-0.348***	-1.451*	-0.050***	-0.069***	-0.052**	-0.030*
	(-8.56)	(-4.76)	(-10.23)	(-8.14)	(-5.25)	(-6.09)	(-4.89)	(-2.49)	(-4.55)	(-4.31)	(-3.14)	(-2.17)
Father/Mother dies=1 # M: Occ (Q2)	0.076	0.101	0.013	0.013	0.006	0.009	-0.056	-0.587	0	-0.005	-0.007	-0.012
	(1.71)	(0.28)	(1.93)	(1.24)	(0.58)	(1.12)	(-0.75)	(-0.96)	(-0.02)	(-0.28)	(-0.39)	(-0.81)
Father/Mother dies=1 # M: Occ (Q3)	0.045	0.308	0.017*	0.011	0.005	-0.002	-0.097	-1.320*	-0.022	-0.024	-0.028	-0.022
	(0.91)	(0.76)	(2.23)	(1.02)	(0.43)	(-0.21)	(-1.20)	(-1.98)	(-1.75)	(-1.38)	(-1.46)	(-1.35)
Father/Mother dies=1 # M: Occ (Q4)	0.09	0.023	0.022**	0.031**	0.011	0	-0.137	-0.875	-0.008	-0.011	-0.029	-0.036*
	(1.78)	(0.05)	(2.87)	(2.84)	(0.95)	(0.03)	(-1.67)	(-1.27)	(-0.65)	(-0.65)	(-1.53)	(-2.17)
Father/Mother dies=1 # M: Occ missing	-0.042	-0.1	0.004	-0.005	-0.017	-0.002	-0.185*	-2.027**	-0.016	-0.024	-0.046*	-0.03
	(-0.72)	(-0.21)	(0.46)	(-0.35)	(-1.25)	(-0.21)	(-1.96)	(-2.58)	(-1.08)	(-1.09)	(-2.10)	(-1.70)
Father/Mother dies=1 # F: Occ (Q2)	-0.007	0.141	0.003	-0.005	0.001	0.012	0.061	0.156	0.008	0.008	0.004	0.004
	(-0.19)	(0.44)	(0.57)	(-0.50)	(0.13)	(1.61)	(0.93)	(0.29)	(0.76)	(0.54)	(0.23)	(0.35)
Father/Mother dies=1 # F: Occ (Q3)	-0.101*	-1.224***	-0.006	0.002	-0.024*	-0.015	0.036	-0.021	0.013	0.018	0.011	-0.005
	(-2.45)	(-3.61)	(-0.90)	(0.24)	(-2.49)	(-1.91)	(0.52)	(-0.04)	(1.32)	(1.19)	(0.68)	(-0.34)
Father/Mother dies=1 # F: Occ (Q4)	-0.009	-0.299	0.012	0.014	0.004	0.002	0.067	-0.392	0.004	0.042**	0.008	-0.023
	(-0.20)	(-0.78)	(1.78)	(1.55)	(0.40)	(0.20)	(0.99)	(-0.68)	(0.38)	(3.00)	(0.50)	(-1.60)
Observations	559,705	523,094	547,029	559,705	559,705	559,705	549,008	513,405	538,469	549,008	549,008	549,008
Adjusted R2	0.203	0.137	0.213	0.067	0.177	0.128	0.203	0.136	0.211	0.066	0.176	0.127
Linear combinations												
Father/Mother dies=1 , mother in Q4	-0.266	-1.594	-0.043	-0.049	-0.041	-0.046	-0.485	-2.326	-0.058	-0.08	-0.082	-0.066
t-value	-6.003	-4.27	-6.509	-5.475	-3.925	-4.97	-6.956	-3.954	-5.596	-5.528	-4.966	-4.498
p-value	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Father/Mother dies=1 , father in Q4	-0.365	-1.916	-0.053	-0.066	-0.048	-0.045	-0.282	-1.843	-0.046	-0.027	-0.044	-0.053
t-value	-7.221	-4.522	-7	-6.17	-4.054	-4.359	-3.655	-2.803	-3.765	-1.667	-2.386	-3.273
p-value	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.005	0.000	0.095	0.017	0.001

Note: the model includes controls for parents' SES (education, occupation, income), and birth year, gender, age at SES measurement, family size, parents' age at birth, and birth order. * p<0.05, ** p<0.01, *** p<0.001

Table 3. Between-family Analysis of Parents' Death by Aunt/Uncles' Occupation.

	Father dies						Mother dies					
	Education, years	Occupation, ISEI	GPA 9th grade, rank	Upper-secondary graduation	Tertiary, entry	Tertiary, graduation	Education, years	Occupation, ISEI	GPA 9th grade, rank	Upper-secondary graduation	Tertiary, entry	Tertiary, graduation
Father/Mother dies=1	-0.326***	-1.367***	-0.047***	-0.070***	-0.050***	-0.042***	-0.367***	-2.203***	-0.056***	-0.066***	-0.063***	-0.036***
	(-11.21)	(-5.72)	(-10.53)	(-10.10)	(-7.38)	(-7.66)	(-6.76)	(-5.02)	(-6.78)	(-5.26)	(-4.99)	(-3.51)
Father/Mother dies=1 # A/U: Occ (Q2)	-0.038	-0.298	-0.011	-0.016	0	-0.001	0.041	-0.231	0.021	0.011	0.01	-0.005
	(-0.86)	(-0.84)	(-1.73)	(-1.62)	(-0.02)	(-0.17)	(0.53)	(-0.36)	(1.70)	(0.64)	(0.55)	(-0.33)
Father/Mother dies=1 # A/U: Occ (Q3)	0.014	-0.484	-0.004	0.015	0.003	0.001	0.006	0.227	0.012	0.012	-0.007	-0.032*
	(0.31)	(-1.32)	(-0.62)	(1.57)	(0.26)	(0.10)	(0.08)	(0.35)	(0.97)	(0.72)	(-0.35)	(-2.03)
Father/Mother dies=1 # A/U: Occ (Q4)	0.034	-1.063**	0.006	0.021*	0.007	-0.01	-0.003	0.198	0.004	0.016	0.012	-0.026
	(0.76)	(-2.76)	(0.97)	(2.25)	(0.62)	(-1.02)	(-0.04)	(0.29)	(0.38)	(1.00)	(0.69)	(-1.55)
Observations	490,360	460,486	480,724	490,360	490,360	490,360	480,666	451,658	472,858	480,666	480,666	480,666
Adjusted R2	0.216	0.149	0.229	0.069	0.189	0.134	0.215	0.148	0.228	0.068	0.189	0.133
Father/Mother dies=1 , A/U in Q4	-0.292	-2.429	-0.04	-0.048	-0.044	-0.051	-0.37	-2.006	-0.051	-0.05	-0.05	-0.062
t-value	-8.384	-8.014	-7.977	-7.324	-5.528	-6.522	-6.396	-3.818	-5.996	-4.691	-3.876	-4.623
p-value	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Note: the model includes controls for parents' SES (education, occupation, income), and birth year, gender, age at SES measurement, family size, parents' age at birth, and birth order. * p<0.05, ** p<0.01, *** p<0.001

Table 4. Between-family Analysis of Parents' Death by Grandparents' Occupation.

	Father dies						Mother dies					
	Education, years	Occupation, ISEI	GPA 9th grade, rank	Upper-secondary graduation	Tertiary, entry	Tertiary, graduation	Education, years	Occupation, ISEI	GPA 9th grade, rank	Upper-secondary graduation	Tertiary, entry	Tertiary, graduation
Father/Mother dies=1	-0.274***	-1.532***	-0.045***	-0.051***	-0.045***	-0.035***	-0.433***	-1.981***	-0.048***	-0.070***	-0.070***	-0.058***
	(-8.60)	(-5.82)	(-9.34)	(-7.40)	(-5.90)	(-5.55)	(-8.55)	(-4.61)	(-6.25)	(-6.25)	(-5.79)	(-5.82)
Father/Mother dies=1 # GP: Occ (Q2)	-0.05	0.213	-0.005	-0.029**	0.001	-0.006	0.121	-0.135	0.001	0.016	0.012	0.018
	(-1.10)	(0.56)	(-0.72)	(-2.79)	(0.06)	(-0.64)	(1.67)	(-0.22)	(0.06)	(1.05)	(0.73)	(1.24)
Father/Mother dies=1 # GP: Occ (Q3)	-0.063	-0.386	-0.001	-0.007	-0.013	-0.007	-0.055	-1.338*	-0.016	-0.003	-0.019	-0.012
	(-1.37)	(-1.02)	(-0.19)	(-0.73)	(-1.19)	(-0.73)	(-0.77)	(-2.19)	(-1.48)	(-0.17)	(-1.12)	(-0.84)
Father/Mother dies=1 # GP: Occ (Q4)	-0.001	-0.576	0.006	-0.003	0.004	0	0.169*	0.218	0.016	0.028	0.028	0.017
	(-0.03)	(-1.46)	(0.85)	(-0.35)	(0.37)	(-0.01)	(2.34)	(0.35)	(1.44)	(1.85)	(1.66)	(1.09)
Observations	485,557	456,055	476,050	485,557	485,557	485,557	477,438	448,672	469,524	477,438	477,438	477,438
Adjusted R2	0.215	0.144	0.23	0.075	0.184	0.133	0.214	0.144	0.229	0.073	0.184	0.133
Father/Mother dies=1 , GP in Q4	-0.276	-2.108	-0.039	-0.055	-0.041	-0.036	-0.264	-1.762	-0.032	-0.043	-0.042	-0.042
t-value	-8.103	-7.153	-7.836	-8.001	-5.214	-4.904	-5.121	-3.965	-4.144	-4.287	-3.613	-3.611
p-value	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Note: the model includes controls for parents' SES (education, occupation, income), and birth year, gender, age at SES measurement, family size, parents' age at birth, and birth order. * p<0.05, ** p<0.01, *** p<0.001

Table 5. Within-family Analysis of Age of Father's Death by Father's and Mother's Occupation.

	Years of education, rank	ISEI, rank	GPA, rank	Upper-secondary, graduation	Tertiary, entry	Tertiary, graduation
Age when father dies	0.000	0.001	0.001	0.001	0.002	0
	(0.16)	(0.60)	(0.89)	(0.51)	(0.67)	(-0.01)
Age when father dies # F: Occ (Q2)	0.001	0.001	0.000	-0.001	0.000	0.001
	(0.45)	(0.67)	(0.32)	(-0.35)	(0.06)	(0.23)
Age when father dies # F: Occ (Q3)	0.000	-0.002	-0.002	0.002	0.001	0.003
	(-0.04)	(-0.89)	(-0.96)	(0.61)	(0.45)	(1.10)
Age when father dies # F: Occ (Q4)	0.003	0.001	0.000	0.004	0.001	0.004
	(1.53)	(0.57)	(-0.10)	(1.58)	(0.23)	(1.16)
Age when father dies # M: Occ (Q2)	0.000	0.002	0.000	0.002	-0.003	-0.001
	(0.18)	(0.76)	(-0.20)	(0.67)	(-0.76)	(-0.36)
Age when father dies # M: Occ (Q3)	-0.001	0.000	-0.002	-0.003	-0.001	-0.003
	(-0.63)	(-0.13)	(-1.17)	(-0.85)	(-0.36)	(-0.83)
Age when father dies # M: Occ (Q4)	-0.001	-0.001	0.001	0.001	0.000	-0.006
	(-0.76)	(-0.48)	(0.41)	(0.26)	(-0.10)	(-1.61)
Age when father dies # M: Occ (Missing)	0.004	-0.002	0.001	0.005	0.000	-0.001
	(1.66)	(-0.77)	(0.60)	(1.56)	(0.03)	(-0.29)
Gender, birth order	Yes	Yes	Yes	Yes	Yes	Yes
Relative age interactions	Yes	Yes	Yes	Yes	Yes	Yes
Observations	341,139	320,117	335,827	341,139	341,139	341,139
Clusters	182,586	162,724	177,818	182,586	182,586	182,586
Adjusted R2	0.445	0.288	0.523	0.223	0.385	0.29
Linear combination: Age when father dies in father's Q4	0.003	0.002	0.001	0.006	0.003	0.004
Linear combination: Age when father dies in father's Q4, t-value	1.509	1.029	0.673	1.858	0.784	1.034
Linear combination: Age when father dies in father's Q4, p-value	0.131	0.303	0.501	0.063	0.433	0.301
Linear combination: Age when father dies in mother's Q4	-0.001	0	0.002	0.002	0.002	-0.006
Linear combination: Age when father dies in mother's Q4, t-value	-0.727	0.033	1.342	0.795	0.54	-1.868
Linear combination: Age when father dies in mother's Q4, p-value	0.467	0.974	0.18	0.426	0.589	0.062

Note: * p<0.05, ** p<0.01, *** p<0.001

Table 6. Within-family Analysis of Age of Mother's Death by Father's and Mother's Occupation.

	Years of education, rank	ISEI, rank	GPA, rank	Upper-secondary, graduation	Tertiary, entry	Tertiary, graduation
Age when mother dies	0.002	0.001	0.002	0.006	0.003	-0.002
	(0.65)	(0.22)	(0.82)	(1.69)	(0.76)	(-0.43)
Age when mother dies # F: Occ (Q2)	-0.001	-0.003	0.000	-0.003	0.000	0.003
	(-0.54)	(-1.15)	(0.08)	(-0.75)	(-0.04)	(0.63)
Age when mother dies # F: Occ (Q3)	-0.002	-0.002	0.001	-0.002	-0.007	-0.001
	(-0.69)	(-0.79)	(0.27)	(-0.60)	(-1.56)	(-0.34)
Age when mother dies # F: Occ (Q4)	-0.003	-0.001	-0.001	0.000	0.000	0.001
	(-1.15)	(-0.37)	(-0.56)	(-0.08)	(-0.06)	(0.25)
Age when mother dies # M: Occ (Q2)	0.002	0.003	0.000	-0.002	0.006	0.006
	(0.79)	(0.92)	(-0.07)	(-0.42)	(1.34)	(1.34)
Age when mother dies # M: Occ (Q3)	0.004	0.005	0.002	0.003	0.006	0.000
	(1.31)	(1.63)	(0.63)	(0.76)	(1.21)	(-0.08)
Age when mother dies # M: Occ (Q4)	0.000	0.002	0.001	-0.001	0.004	-0.002
	(-0.01)	(0.59)	(0.28)	(-0.18)	(0.69)	(-0.39)
Age when father dies # M: Occ (Missing)	0.002	0.000	-0.002	-0.008	0.004	0.005
	(0.66)	(-0.04)	(-0.70)	(-1.69)	(0.59)	(0.86)
Gender, birth order	Yes	Yes	Yes	Yes	Yes	Yes
Relative age interactions	Yes	Yes	Yes	Yes	Yes	Yes
Observations	341,139	320,117	335,827	341,139	341,139	341,139
Clusters	182,586	162,724	177,818	182,586	182,586	182,586
Adjusted R2	0.445	0.288	0.523	0.223	0.385	0.29
Linear combination: Age when mother dies in father's Q4	-0.001	0	0.001	0.006	0.003	-0.001
Linear combination: Age when mother dies in father's Q4, t-value	-0.448	-0.141	0.225	1.428	0.621	-0.164
Linear combination: Age when mother dies in father's Q4, p-value	0.654	0.888	0.822	0.153	0.535	0.87
Linear combination: Age when mother dies in mother's Q4	0.002	0.003	0.003	0.005	0.007	-0.004
Linear combination: Age when mother dies in mother's Q4, t-value	0.632	0.893	1.125	1.45	1.54	-0.868
Linear combination: Age when mother dies in mother's Q4, p-value	0.527	0.372	0.261	0.147	0.124	0.386

Note: * p<0.05, ** p<0.01, *** p<0.001

Table 7. Within-family Analysis of Age of Father's and Mother's Death by Aunts/Uncle's Occupation.

	Years of education, rank	ISEI, rank	GPA, rank	Upper-secondary, graduation	Tertiary, entry	Tertiary, graduation
Age when father dies	0	0.002	0.001	0	0.002	-0.002
	(-0.19)	(0.90)	(0.37)	(0.15)	(0.59)	(-0.52)
Age when father dies # A/U: Occ (Q2)	0	0.001	-0.001	0.001	0.001	0.002
	(-0.29)	(0.29)	(-0.46)	(0.57)	(0.18)	(0.59)
Age when father dies # A/U: Occ (Q3)	0.003	0.002	0.004*	0.005*	0.008*	0.005
	(1.93)	(0.74)	(2.42)	(1.98)	(2.57)	(1.57)
Age when father dies # A/U: Occ (Q4)	0.003	0.001	0.001	0.001	0.005	0.007*
	(1.93)	(0.61)	(0.36)	(0.49)	(1.58)	(2.16)
Gender, birth order	Yes	Yes	Yes	Yes	Yes	Yes
Relative age interactions	Yes	Yes	Yes	Yes	Yes	Yes
F M age dead SES interactions	Yes	Yes	Yes	Yes	Yes	Yes
Observations	300,497	283,373	296,543	300,497	300,497	300,497
Clusters	160,455	144,193	156,830	160,455	160,455	160,455
Adjusted R2	0.444	0.288	0.525	0.216	0.386	0.289
Linear combination: Age when father dies in Q4	0.003	0.004	0.001	0.002	0.008	0.005
Linear combination: Age when father dies in Q4, t-value	1.359	1.243	0.594	0.508	1.738	1.255
Linear combination: Age when father dies in Q4, p-value	0.174	0.214	0.552	0.611	0.082	0.209
Age when mother dies	0.002	0.001	0.003	0.007	0.004	-0.004
	(0.78)	(0.20)	(1.30)	(1.66)	(0.71)	(-0.85)
Age when mother dies # A/U: Occ (Q2)	-0.003	0	-0.003	-0.002	-0.004	-0.003
	(-1.12)	(0.10)	(-1.24)	(-0.60)	(-0.84)	(-0.76)
Age when mother dies # A/U: Occ (Q3)	0	0.003	-0.002	0	-0.006	0
	(0.16)	(0.98)	(-0.64)	(-0.08)	(-1.27)	(-0.07)
Age when mother dies # A/U: Occ (Q4)	0.003	0.004	0.002	0.006	0.001	0.003
	(1.15)	(1.09)	(0.85)	(1.46)	(0.29)	(0.65)
Gender, birth order	Yes	Yes	Yes	Yes	Yes	Yes
Relative age interactions	Yes	Yes	Yes	Yes	Yes	Yes
F M age dead SES interactions	Yes	Yes	Yes	Yes	Yes	Yes
Observations	300,497	283,373	296,543	300,497	300,497	300,497
Clusters	160,455	144,193	156,830	160,455	160,455	160,455
Adjusted R2	0.444	0.288	0.525	0.216	0.386	0.289
Linear combination: Age when mother dies in Q4	0.005	0.004	0.006	0.013	0.005	-0.001
Linear combination: Age when mother dies in Q4, t-value	1.581	1.046	1.791	2.583	0.84	-0.206
Linear combination: Age when mother dies in Q4, p-value	0.114	0.296	0.073	0.01	0.401	0.837

Note: * p<0.05, ** p<0.01, *** p<0.001

Table 8. Within-family Analysis of Age of Father's and Mother's Death by Grandparents' Occupation.

	Years of education, rank	ISEI, rank	GPA, rank	Upper-secondary, graduation	Tertiary, entry	Tertiary, graduation
Age when father dies	-0.002	0	0	-0.003	0	-0.001
	(-0.87)	(-0.07)	(0.01)	(-0.98)	(0.03)	(-0.40)
Age when father dies # GP: Occ (Q2)	0.004*	0.004	0.002	0.008***	0.005	0.002
	(2.41)	(1.95)	(1.59)	(3.51)	(1.72)	(0.58)
Age when father dies # GP: Occ (Q3)	0.004*	0.005**	0.003	0.007**	0.009**	0.006*
	(2.47)	(2.58)	(1.83)	(2.89)	(3.08)	(2.03)
Age when father dies # GP: Occ (Q4)	0.005**	0.006**	0.005**	0.010***	0.007*	0.009**
	(2.87)	(2.65)	(2.93)	(3.77)	(2.25)	(2.77)
Gender, birth order	Yes	Yes	Yes	Yes	Yes	Yes
Relative age interactions	Yes	Yes	Yes	Yes	Yes	Yes
F M age dead SES interactions	Yes	Yes	Yes	Yes	Yes	Yes
Observations	321,159	302,530	316,747	321,159	321,159	321,159
Clusters	171,460	153,798	167,442	171,460	171,460	171,460
Adjusted R2	0.443	0.288	0.524	0.216	0.386	0.289
Linear combination: Age when father dies in Q4	0.003	0.006	0.005	0.007	0.007	0.007
Linear combination: Age when father dies in Q4, t-value	1.463	1.991	2.261	2.06	1.758	1.788
Linear combination: Age when father dies in Q4, p-value	0.144	0.046	0.024	0.039	0.079	0.074
Age when mother dies	0.001	0.001	0.002	0.004	0.003	-0.005
	(0.56)	(0.43)	(0.71)	(1.00)	(0.57)	(-0.93)
Age when mother dies # GP: Occ (Q2)	0.001	-0.002	0.002	0.006	0.004	0.004
	(0.48)	(-0.59)	(0.71)	(1.61)	(0.90)	(1.02)
Age when mother dies # GP: Occ (Q3)	0.003	0.004	0.003	0.007*	-0.002	0.006
	(1.24)	(1.31)	(1.19)	(2.00)	(-0.35)	(1.48)
Age when mother dies # GP: Occ (Q4)	0	0.002	0.003	0.004	-0.002	0.003
	(-0.07)	(0.63)	(1.45)	(0.99)	(-0.34)	(0.78)
Gender, birth order	Yes	Yes	Yes	Yes	Yes	Yes
Relative age interactions	Yes	Yes	Yes	Yes	Yes	Yes
F M age dead SES interactions	Yes	Yes	Yes	Yes	Yes	Yes
Observations	321,159	302,530	316,747	321,159	321,159	321,159
Clusters	171,460	153,798	167,442	171,460	171,460	171,460
Adjusted R2	0.443	0.288	0.524	0.216	0.386	0.289
Linear combination: Age when mother dies in Q4	0.001	0.003	0.005	0.008	0.001	-0.001
Linear combination: Age when mother dies in Q4, t-value	0.42	0.858	1.737	1.624	0.225	-0.196
Linear combination: Age when mother dies in Q4, p-value	0.674	0.391	0.082	0.104	0.822	0.845

Note: * p<0.05, ** p<0.01, *** p<0.001

Table A1. Case selection.

No. cases after selection on…	No. Individuals	No. w/ parent dying age 0-16	No. w/ parent dying age 0-39
Cohort cut (born 1973-82)	1,370,171		
Match to both parents	1,056,594		
Only biological parents	1,039,825	32,346	167,734
Negative age of death	1,039,702	32,223	167,611
Both parents die 0-16	1,039,176	31,697	167,085
Children die before age 32	1,028,485	31,105	164,596
After matching for SES measurement age [a]	706,707	30,439	134,240
No valid information on parents' SES[b]	669,317	28,650	127,639
Valid information any outcomes at age 30	638,369	27,261	122,584
Drop any parent dies age<1	637,841	26,733	122,056
Cross sectional analysis			
Drop any parents dying age 17-32	566,661	24,609	
Fixed effects analysis			
Drop singletons	341,139		53,790

Note: Any deviations from the last figure to the estimated model are due to further internal missing on outcomes; [a] this delimits the data to have common support across treated and controls [b] except for education for mother and fathers, and occupation (ISEI) for mothers, where missing are included as a separate category; [c] we dropped cells where treated where matched to less than 3 controls since common support then is limited.

Online Appendix Part I: Education

Table S1. Between-family Analysis of Parents' Death by Parents' Education.

	Father dies						Mother dies					
	Education, years	Occupation, ISEI	GPA 9th grade, rank	Upper-secondary graduation	Tertiary, entry	Tertiary, graduation	Education, years	Occupation, ISEI	GPA 9th grade, rank	Upper-secondary graduation	Tertiary, entry	Tertiary, graduation
Father/Mother dies=1	-0.342***	-1.793***	-0.065***	-0.084***	-0.051***	-0.040***	-0.382***	-2.604***	-0.054***	-0.068***	-0.073***	-0.040***
	(-13.25)	(-8.64)	(-16.96)	(-13.61)	(-8.37)	(-8.44)	(-8.88)	(-7.37)	(-8.31)	(-6.63)	(-7.21)	(-5.00)
Father/Mother dies=1 # M: Up. sec. (short)	0.083*	0.447	0.019**	0.022**	0.011	0.014	-0.135*	-0.339	-0.009	-0.023	-0.011	-0.026*
	(2.07)	(1.37)	(3.23)	(2.59)	(1.19)	(1.82)	(-2.13)	(-0.65)	(-0.97)	(-1.69)	(-0.68)	(-2.07)
Father/Mother dies=1 # M: Up. sec.	-0.013	-0.178	0.014*	0.019*	-0.006	-0.005	-0.048	0.024	0.004	-0.009	0.014	0.001
	(-0.29)	(-0.49)	(1.99)	(1.97)	(-0.53)	(-0.58)	(-0.67)	(0.04)	(0.34)	(-0.61)	(0.84)	(0.05)
Father/Mother dies=1 # M: Postsec.	0.112	0.921	0.019*	0.040***	0.022	0.011	-0.261**	-1.585	-0.012	-0.016	-0.037	-0.044*
	(1.76)	(1.69)	(2.03)	(3.33)	(1.46)	(0.77)	(-2.67)	(-1.84)	(-0.84)	(-0.87)	(-1.61)	(-1.99)
Father/Mother dies=1 # M: Tertiary	0.194**	0.487	0.025**	0.041***	0.040**	0.002	-0.162	-1.348	-0.025	0.002	-0.025	-0.046*
	(3.10)	(0.86)	(2.64)	(3.62)	(2.84)	(0.15)	(-1.78)	(-1.65)	(-1.81)	(0.15)	(-1.19)	(-2.12)
Father/Mother dies=1 # M: Missing	0.031	0.444	0.008	0.006	0.003	0.005	-0.145	0.051	-0.021	-0.035	-0.046*	-0.025
	(0.45)	(0.81)	(0.78)	(0.42)	(0.17)	(0.43)	(-1.42)	(0.06)	(-1.42)	(-1.48)	(-2.00)	(-1.32)
Father/Mother dies=1 # F: Up. sec. (short)	-0.05	-0.285	0.003	0.005	-0.014	-0.01	0.028	-0.657	0	0.015	0.013	-0.006
	(-1.15)	(-0.80)	(0.43)	(0.52)	(-1.36)	(-1.17)	(0.40)	(-1.16)	(-0.05)	(1.02)	(0.77)	(-0.39)
Father/Mother dies=1 # F: Up. sec.	-0.063	-0.364	0.009	-0.003	-0.015	-0.017*	0.151*	1.601**	0.018	0.025	0.014	0.002
	(-1.57)	(-1.11)	(1.48)	(-0.39)	(-1.61)	(-2.12)	(2.41)	(3.06)	(1.85)	(1.84)	(0.91)	(0.17)
Father/Mother dies=1 # F: Postsec.	-0.214**	-0.968	0.02	0.003	-0.019	-0.022	0.143	1.051	0.018	0.02	0.025	0.015
	(-2.79)	(-1.49)	(1.74)	(0.22)	(-1.06)	(-1.33)	(1.29)	(1.09)	(1.11)	(1.00)	(0.96)	(0.62)
Father/Mother dies=1 # F: Tertiary	-0.072	-0.976	0.007	0.025*	-0.030*	-0.029	0.198*	1.326	0.029*	0.040*	0.049*	-0.014
	(-1.12)	(-1.64)	(0.70)	(2.22)	(-2.09)	(-1.90)	(2.23)	(1.67)	(2.12)	(2.54)	(2.48)	(-0.69)
Father/Mother dies=1 # F: Missing	-0.003	-0.285	0.012	0.026	-0.008	0.003	-0.013	0.901	0.007	0.006	0.042	0.016
	(-0.04)	(-0.51)	(1.11)	(1.65)	(-0.49)	(0.25)	(-0.11)	(0.99)	(0.42)	(0.23)	(1.62)	(0.80)
Observations	559,705	523,094	547,029	559,705	559,705	559,705	549,008	513,405	538,469	549,008	549,008	549,008
Adjusted R2	0.203	0.137	0.213	0.067	0.177	0.128	0.203	0.136	0.211	0.066	0.176	0.127

Note: the model includes controls for parents' SES (education, occupation, income), and birth year, gender, age at SES measurement, family size, parents' age at birth, and birth order. * p<0.05, ** p<0.01, *** p<0.001

Table S2. Between-family Analysis of Parents' Death by Aunt/Uncles' Education.

	Father dies						Mother dies					
	Education, years	Occupation, ISEI	GPA 9th grade, rank	Upper-secondary graduation	Tertiary, entry	Tertiary, graduation	Education, years	Occupation, ISEI	GPA 9th grade, rank	Upper-secondary graduation	Tertiary, entry	Tertiary, graduation
Father/Mother dies=1	-0.374***	-1.650***	-0.061***	-0.083***	-0.056***	-0.047***	-0.380***	-1.736***	-0.057***	-0.067***	-0.057***	-0.033**
	(-12.60)	(-6.91)	(-13.31)	(-11.67)	(-7.94)	(-8.49)	(-6.75)	(-3.81)	(-6.68)	(-5.25)	(-4.32)	(-3.05)
Father/Mother dies=1 # A/U: Edu (Q2)	0.108*	0.456	0.017*	0.016	0.025*	0.023**	0.08	-0.022	0.011	0.019	-0.01	-0.013
	(2.30)	(1.20)	(2.44)	(1.47)	(2.30)	(2.66)	(0.98)	(-0.03)	(0.82)	(1.01)	(-0.50)	(-0.79)
Father/Mother dies=1 # A/U: Edu (Q3)	0.034	-0.161	0.013*	0.021*	-0.006	-0.003	0.021	-1.126	0.008	-0.003	-0.011	-0.023
	(0.81)	(-0.47)	(2.10)	(2.25)	(-0.60)	(-0.41)	(0.28)	(-1.78)	(0.69)	(-0.16)	(-0.59)	(-1.48)
Father/Mother dies=1 # A/U: Edu (Q4)	0.079	-0.855*	0.018*	0.037***	0.018	-0.004	0.005	-0.349	0.023	0.03	0.014	-0.036*
	(1.72)	(-2.18)	(2.56)	(3.84)	(1.66)	(-0.40)	(0.07)	(-0.50)	(1.89)	(1.87)	(0.74)	(-2.08)
Observations	490,360	460,486	480,724	490,360	490,360	490,360	480,666	451,658	472,858	480,666	480,666	480,666
Adjusted R2	0.216	0.149	0.229	0.069	0.189	0.134	0.215	0.148	0.228	0.068	0.189	0.133

Note: the model includes controls for parents' SES (education, occupation, income), and birth year, gender, age at SES measurement, family size, parents' age at birth, and birth order. * p<0.05, ** p<0.01, *** p<0.001

Table S3. Between-family Analysis of Parents' Death by Grandparents' Education.

	Father dies						Mother dies					
	Education, years	Occupation, ISEI	GPA 9th grade, rank	Upper-secondary graduation	Tertiary, entry	Tertiary, graduation	Education, years	Occupation, ISEI	GPA 9th grade, rank	Upper-secondary graduation	Tertiary, entry	Tertiary, graduation
Father/Mother dies=1	-0.317***	-1.659***	-0.048***	-0.068***	-0.050***	-0.043***	-0.411***	-2.435***	-0.046***	-0.079***	-0.069***	-0.054***
	(-13.31)	(-8.44)	(-13.53)	(-12.81)	(-8.88)	(-9.09)	(-11.02)	(-7.77)	(-8.16)	(-9.58)	(-7.75)	(-7.18)
Father/Mother dies=1 # GP: Edu (Q2)	0.008	-0.086	0.011	-0.001	0.011	0.019	0.057	0.471	-0.012	0.046**	0.004	0.001
	(0.17)	(-0.22)	(1.54)	(-0.11)	(0.98)	(1.94)	(0.74)	(0.74)	(-1.04)	(2.86)	(0.21)	(0.04)
Father/Mother dies=1 # GP: Edu (Q3)	0.014	-0.289	-0.003	0.012	-0.004	0.005	0.069	-0.084	0.009	0.037*	0.014	0.014
	(0.32)	(-0.76)	(-0.46)	(1.25)	(-0.33)	(0.53)	(1.00)	(-0.14)	(0.81)	(2.52)	(0.82)	(0.92)
Father/Mother dies=1 # GP: Edu (Q4)	0.055	0.033	0.013*	0.025**	0.012	0.003	0.079	0.472	-0.006	0.026	0.007	-0.005
	(1.23)	(0.09)	(2.00)	(2.66)	(1.18)	(0.30)	(1.15)	(0.80)	(-0.59)	(1.87)	(0.47)	(-0.33)
Observations	485,557	456,055	476,050	485,557	485,557	485,557	477,438	448,672	469,524	477,438	477,438	477,438
Adjusted R2	0.215	0.144	0.23	0.075	0.184	0.133	0.214	0.144	0.229	0.073	0.184	0.133

Note: the model includes controls for parents' SES (education, occupation, income), and birth year, gender, age at SES measurement, family size, parents' age at birth, and birth order. * p<0.05, ** p<0.01, *** p<0.001

Table S4. Within-family Analysis of Age of Father's Death by Father's and Mother's Education.

	Years of education, rank	ISEI, rank	GPA, rank	Upper-secondary, graduation	Tertiary, entry	Tertiary, graduation
Age when father dies	0.001	0.001	0.002	-0.001	0.002	0
	(1.24)	(1.11)	(1.75)	(-0.73)	(0.79)	(0.14)
Age when father dies # M: Up. sec. (short)	0	0	0.001	0	0.004	0
	(0.11)	(-0.02)	(0.31)	(-0.08)	(1.16)	(-0.07)
Age when father dies # M: Up. sec.	-0.002	-0.002	-0.002	0.003	0	-0.004
	(-1.01)	(-1.26)	(-1.33)	(1.21)	(-0.07)	(-1.33)
Age when father dies # M: Postsec.	-0.001	0	-0.001	-0.001	-0.006	-0.001
	(-0.43)	(0.09)	(-0.36)	(-0.30)	(-1.11)	(-0.13)
Age when father dies # M: Tertiary	0.002	-0.003	-0.002	0.001	0.002	0.001
	(0.80)	(-1.03)	(-0.97)	(0.18)	(0.46)	(0.15)
Age when father dies # M: Missing	0	-0.005	0	-0.004	-0.002	-0.004
	(-0.06)	(-1.52)	(-0.13)	(-0.94)	(-0.32)	(-0.80)
Age when father dies # F: Up. sec. (short)	-0.002	0.003	-0.002	0.004	-0.005	0
	(-1.04)	(1.31)	(-1.23)	(1.63)	(-1.68)	(-0.10)
Age when father dies # F: Up. sec.	0.002	-0.001	0.001	0.010***	0.003	0.002
	(1.24)	(-0.51)	(0.31)	(3.82)	(1.02)	(0.59)
Age when father dies # F: Postsec.	-0.001	-0.001	-0.002	0.004	-0.003	-0.003
	(-0.59)	(-0.18)	(-0.90)	(1.10)	(-0.73)	(-0.71)
Age when father dies # F: Tertiary	0	0.007*	0.001	0.005	0.002	0
	(-0.17)	(2.54)	(0.64)	(1.49)	(0.36)	(0.03)
Age when father dies # F: Missing	0.003	0	0.003	0.009*	0.006	0.008
	(1.31)	(0.10)	(1.13)	(2.35)	(1.18)	(1.74)
Gender, birth order	Yes	Yes	Yes	Yes	Yes	Yes
Relative age interactions	Yes	Yes	Yes	Yes	Yes	Yes
Observations	341,139	320,117	335,827	341,139	341,139	341,139
Clusters	182,580	162,718	177,812	182,580	182,580	182,580
Adjusted R2	0.446	0.288	0.523	0.223	0.385	0.291

Note: the model includes controls for parents' SES (education, occupation, income), and birth year, gender, age at SES measurement, family size, parents' age at birth, and birth order. * p<0.05, ** p<0.01, *** p<0.001

Table S5. Within-family Analysis of Age of Mother's Death by Father's and Mother's Education.

	Years of education, rank	ISEI, rank	GPA, rank	Upper-secondary, graduation	Tertiary, entry	Tertiary, graduation
Age when mother dies	0.004**	0.001	0.002	0.007**	0.009**	0.003
	(2.97)	(0.73)	(1.27)	(2.84)	(3.10)	(1.06)
Age when mother dies # M: Up. sec. (short)	-0.001	-0.001	-0.002	0	0.002	0.003
	(-0.27)	(-0.42)	(-0.73)	(0.10)	(0.51)	(0.75)
Age when mother dies # M: Up. sec.	-0.003	0.004	-0.002	-0.008*	-0.001	-0.003
	(-1.60)	(1.30)	(-1.12)	(-2.42)	(-0.20)	(-0.86)
Age when mother dies # M: Postsec.	-0.007	0.001	-0.002	-0.007	0.004	-0.001
	(-1.95)	(0.18)	(-0.70)	(-1.33)	(0.61)	(-0.09)
Age when mother dies # M: Tertiary	-0.003	0	0	-0.002	0	-0.008
	(-0.81)	(0.01)	(0.07)	(-0.32)	(-0.04)	(-1.27)
Age when mother dies # M: Missing	-0.002	-0.003	-0.008*	-0.011	0.003	0.002
	(-0.41)	(-0.57)	(-2.01)	(-1.76)	(0.35)	(0.34)
Age when mother dies # F: Up. sec. (short)	-0.002	0.001	0.003	-0.002	-0.008	0
	(-0.70)	(0.29)	(1.32)	(-0.64)	(-1.85)	(-0.08)
Age when mother dies # F: Up. sec.	0	-0.002	0.003	0.003	-0.005	-0.004
	(-0.07)	(-0.52)	(1.10)	(0.82)	(-1.14)	(-0.94)
Age when mother dies # F: Postsec.	-0.002	-0.008*	0.001	0.002	-0.005	-0.003
	(-0.73)	(-2.00)	(0.40)	(0.34)	(-0.83)	(-0.42)
Age when mother dies # F: Tertiary	-0.001	0.005	0.003	0.002	-0.003	0
	(-0.23)	(1.18)	(0.83)	(0.43)	(-0.42)	(-0.01)
Age when mother dies # F: Missing	-0.006	-0.002	0.003	-0.002	-0.002	-0.004
	(-1.40)	(-0.43)	(0.67)	(-0.32)	(-0.33)	(-0.54)
Gender, birth order	Yes	Yes	Yes	Yes	Yes	Yes
Relative age interactions	Yes	Yes	Yes	Yes	Yes	Yes
Observations	341,139	320,117	335,827	341,139	341,139	341,139
Clusters	182,580	162,718	177,812	182,580	182,580	182,580
Adjusted R2	0.446	0.288	0.523	0.223	0.385	0.291

Note: * p<0.05, ** p<0.01, *** p<0.001

Table S6. Within-family Analysis of Age of Father's and Mother's Death by Aunts/Uncle's Education.

	Years of education, rank	ISEI, rank	GPA, rank	Upper-secondary, graduation	Tertiary, entry	Tertiary, graduation
Age when father dies	0	0.001	0.002	-0.004*	0.001	0
	(0.02)	(0.33)	(1.44)	(-2.17)	(0.55)	(-0.12)
Age when father dies # A/U: Edu (Q2)	0.003	0.003	-0.001	0.006*	-0.003	0
	(1.50)	(1.41)	(-0.36)	(2.21)	(-0.98)	(0.13)
Age when father dies # A/U: Edu (Q3)	0.002	0.002	0.001	0.004	0.004	0
	(1.07)	(0.93)	(0.34)	(1.70)	(1.23)	(0.11)
Age when father dies # A/U: Edu (Q4)	0.003	0.004	-0.001	0.002	0.006	0.004
	(1.47)	(1.56)	(-0.43)	(0.72)	(1.59)	(1.02)
Gender, birth order	Yes	Yes	Yes	Yes	Yes	Yes
Relative age interactions	Yes	Yes	Yes	Yes	Yes	Yes
F M age dead SES interactions	Yes	Yes	Yes	Yes	Yes	Yes
Observations	300,293	283,182	296,344	300,293	300,293	300,293
Clusters	160,346	144,097	156,726	160,346	160,346	160,346
Adjusted R2	0.445	0.288	0.525	0.217	0.386	0.289
Age when mother dies	0.003	0	0.003	0	0.011**	0.002
	(1.63)	(0.12)	(1.56)	(0.16)	(2.91)	(0.49)
Age when mother dies # A/U: Edu (Q2)	0	0.002	-0.002	0.007	-0.002	-0.002
	(0.03)	(0.79)	(-0.66)	(1.71)	(-0.35)	(-0.37)
Age when mother dies # A/U: Edu (Q3)	0.002	0.004	0.001	0.008*	-0.004	0.005
	(0.91)	(1.24)	(0.45)	(2.16)	(-0.97)	(1.19)
Age when mother dies # A/U: Edu (Q4)	0.005*	0.003	0.001	0.010*	0.007	0.008
	(1.97)	(0.89)	(0.42)	(2.44)	(1.28)	(1.59)
Gender, birth order	Yes	Yes	Yes	Yes	Yes	Yes
Relative age interactions	Yes	Yes	Yes	Yes	Yes	Yes
F M age dead SES interactions	Yes	Yes	Yes	Yes	Yes	Yes
Observations	300,293	283,182	296,344	300,293	300,293	300,293
Clusters	160,346	144,097	156,726	160,346	160,346	160,346
Adjusted R2	0.445	0.288	0.525	0.217	0.386	0.289

Note: * p<0.05, ** p<0.01, *** p<0.001

Table S7. Within-family Analysis of Age of Father's and Mother's Death by Grandparents' Education.

	Years of education, rank	ISEI, rank	GPA, rank	Upper-secondary, graduation	Tertiary, entry	Tertiary, graduation
Age when father dies	0.001	0.001	0.001	-0.003	0.001	0
	(0.41)	(0.59)	(0.86)	(-1.73)	(0.35)	(0.14)
Age when father dies # GP: Edu (Q2)	0.001	0.003	0.001	0.006*	0.005	0.001
	(0.83)	(1.44)	(0.73)	(2.32)	(1.51)	(0.29)
Age when father dies # GP: Edu (Q3)	0.001	0.002	0	0.002	0.004	0.002
	(0.47)	(0.94)	(-0.07)	(0.69)	(1.10)	(0.64)
Age when father dies # GP: Edu (Q4)	0.003	0.004	0.002	0.004	0.003	0.003
	(1.78)	(1.81)	(1.45)	(1.53)	(0.83)	(0.98)
Gender, birth order	Yes	Yes	Yes	Yes	Yes	Yes
Relative age interactions	Yes	Yes	Yes	Yes	Yes	Yes
F M age dead SES interactions	Yes	Yes	Yes	Yes	Yes	Yes
Observations	301,371	284,162	297,377	301,371	301,371	301,371
Clusters	160,867	144,553	157,217	160,867	160,867	160,867
Adjusted R2	0.442	0.286	0.522	0.217	0.384	0.288
Age when mother dies	0.004*	0.002	0.002	0.005	0.007*	0.002
	(2.19)	(0.90)	(0.95)	(1.77)	(2.27)	(0.61)
Age when mother dies # GP: Edu (Q2)	-0.001	0	0.002	-0.003	0.005	0.001
	(-0.36)	(0.14)	(0.80)	(-0.67)	(1.12)	(0.23)
Age when mother dies # GP: Edu (Q3)	0.002	0.002	0.003	0.005	0.009*	0.001
	(0.95)	(0.50)	(1.42)	(1.37)	(1.97)	(0.32)
Age when mother dies # GP: Edu (Q4)	0.001	0.002	0.002	0	0.004	0.005
	(0.55)	(0.74)	(0.67)	(0.06)	(0.82)	(1.15)
Gender, birth order	Yes	Yes	Yes	Yes	Yes	Yes
Relative age interactions	Yes	Yes	Yes	Yes	Yes	Yes
F M age dead SES interactions	Yes	Yes	Yes	Yes	Yes	Yes
Observations	301,371	284,162	297,377	301,371	301,371	301,371
Clusters	160,867	144,553	157,217	160,867	160,867	160,867
Adjusted R2	0.442	0.286	0.522	0.217	0.384	0.288

Note: * p<0.05, ** p<0.01, *** p<0.001

Online Appendix Part II: Income

Table S8. Between-family Analysis of Parents' Death by Parents' Income.

	Father dies						Mother dies					
	Education, years	Occupation, ISEI	GPA 9th grade, rank	Upper-secondary graduation	Tertiary, entry	Tertiary, graduation	Education, years	Occupation, ISEI	GPA 9th grade, rank	Upper-secondary graduation	Tertiary, entry	Tertiary, graduation
Father/Mother dies=1	-0.344***	-2.126***	-0.061***	-0.075***	-0.043***	-0.037***	-0.339***	-1.872***	-0.048***	-0.077***	-0.054***	-0.044***
	(-9.11)	(-6.81)	(-10.96)	(-8.79)	(-4.81)	(-5.01)	(-5.49)	(-3.61)	(-5.34)	(-5.49)	(-3.68)	(-3.60)
Father/Mother dies=1 # M: Inc (Q2)	-0.033	-0.245	0.005	-0.001	-0.023*	-0.011	-0.101	-0.362	-0.019*	-0.018	-0.011	-0.007
	(-0.74)	(-0.66)	(0.76)	(-0.10)	(-2.22)	(-1.18)	(-1.52)	(-0.66)	(-1.98)	(-1.29)	(-0.71)	(-0.50)
Father/Mother dies=1 # M: Inc (Q3)	-0.057	0.14	-0.002	-0.01	-0.021*	-0.007	-0.142*	-1.082*	-0.025*	-0.01	-0.031*	-0.016
	(-1.30)	(0.38)	(-0.35)	(-1.08)	(-2.04)	(-0.78)	(-2.18)	(-1.97)	(-2.53)	(-0.76)	(-1.99)	(-1.17)
Father/Mother dies=1 # M: Inc (Q4)	0.01	0.244	0.013*	0.008	-0.011	0.002	-0.128	-0.95	-0.01	-0.017	-0.028	-0.032*
	(0.25)	(0.72)	(2.04)	(0.85)	(-1.13)	(0.29)	(-1.91)	(-1.70)	(-1.02)	(-1.18)	(-1.78)	(-2.32)
Father/Mother dies=1 # F: Inc (Q2)	0.076	0.661*	0.009	0.012	0.016	0.008	0.021	-0.051	0.016	0.023	0.001	0.01
	(1.93)	(2.07)	(1.57)	(1.35)	(1.71)	(1.06)	(0.30)	(-0.09)	(1.55)	(1.45)	(0.03)	(0.75)
Father/Mother dies=1 # F: Inc (Q3)	0.022	0.226	0.007	0.01	-0.002	-0.016*	0.021	0.224	0.014	0.016	-0.007	0
	(0.55)	(0.67)	(1.22)	(1.12)	(-0.25)	(-1.96)	(0.32)	(0.40)	(1.34)	(1.05)	(-0.43)	(0.01)
Father/Mother dies=1 # F: Inc (Q4)	-0.003	-0.077	0.011	0.022*	0	-0.018*	0.093	0.084	0.009	0.055***	0.022	-0.003
	(-0.08)	(-0.21)	(1.70)	(2.45)	(-0.00)	(-2.05)	(1.44)	(0.15)	(0.96)	(3.98)	(1.44)	(-0.21)
Observations	559,705	523,094	547,029	559,705	559,705	559,705	549,008	513,405	538,469	549,008	549,008	549,008
Adjusted R2	0.203	0.137	0.213	0.067	0.177	0.128	0.203	0.136	0.211	0.066	0.176	0.127

Note: the model includes controls for parents' SES (education, occupation, income), and birth year, gender, age at SES measurement, family size, parents' age at birth, and birth order. * p<0.05, ** p<0.01, *** p<0.001

Table S9. Between-family Analysis of Parents' Death by Aunt/Uncles' Income.

	Father dies						Mother dies					
	Education, years	Occupation, ISEI	GPA 9th grade, rank	Upper-secondary graduation	Tertiary, entry	Tertiary, graduation	Education, years	Occupation, ISEI	GPA 9th grade, rank	Upper-secondary graduation	Tertiary, entry	Tertiary, graduation
Father/Mother dies=1	-0.350***	-1.660***	-0.054***	-0.073***	-0.053***	-0.040***	-0.451***	-2.537***	-0.065***	-0.069***	-0.079***	-0.054***
	(-11.91)	(-6.92)	(-12.21)	(-10.58)	(-7.67)	(-7.26)	(-8.26)	(-5.70)	(-7.56)	(-5.49)	(-6.22)	(-5.14)
Father/Mother dies=1 # A/U: Inc (Q2)	0.025	0.253	0.004	-0.006	0.003	-0.002	0.188*	0.668	0.027*	0.019	0.029	0.022
	(0.57)	(0.71)	(0.67)	(-0.64)	(0.31)	(-0.24)	(2.42)	(1.04)	(2.24)	(1.06)	(1.59)	(1.43)
Father/Mother dies=1 # A/U: Inc (Q3)	0.043	-0.18	0.009	0.009	0.014	-0.004	0.128	0.224	0.027*	0.021	0.03	-0.004
	(0.95)	(-0.49)	(1.38)	(0.86)	(1.32)	(-0.40)	(1.64)	(0.34)	(2.26)	(1.22)	(1.60)	(-0.26)
Father/Mother dies=1 # A/U: Inc (Q4)	0.045	-0.687	0.007	0.031***	0.002	-0.011	0.065	0.627	0.017	0.013	0.024	-0.009
	(1.00)	(-1.81)	(1.05)	(3.30)	(0.18)	(-1.18)	(0.81)	(0.92)	(1.35)	(0.80)	(1.31)	(-0.51)
Observations	490,360	460,486	480,724	490,360	490,360	490,360	480,666	451,658	472,858	480,666	480,666	480,666
Adjusted R2	0.216	0.149	0.229	0.069	0.189	0.134	0.215	0.148	0.228	0.068	0.189	0.133

Note: the model includes controls for parents' SES (education, occupation, income), and birth year, gender, age at SES measurement, family size, parents' age at birth, and birth order. * p<0.05, ** p<0.01, *** p<0.001

Table S10. Between-family Analysis of Parents' Death by Grandparents' Income.

	Father dies						Mother dies					
	Education, years	Occupation, ISEI	GPA 9th grade, rank	Upper-secondary graduation	Tertiary, entry	Tertiary, graduation	Education, years	Occupation, ISEI	GPA 9th grade, rank	Upper-secondary graduation	Tertiary, entry	Tertiary, graduation
Father/Mother dies=1	-0.313***	-1.762***	-0.049***	-0.066***	-0.044***	-0.043***	-0.399***	-2.094***	-0.058***	-0.070***	-0.073***	-0.061***
	(-9.42)	(-6.27)	(-9.65)	(-9.09)	(-5.52)	(-6.39)	(-7.83)	(-4.82)	(-7.61)	(-6.48)	(-6.03)	(-5.81)
Father/Mother dies=1 # GP: Inc (Q2)	0.004	-0.065	0.004	0.004	-0.006	0.004	-0.008	-0.261	0.015	0.015	0.003	0.003
	(0.09)	(-0.17)	(0.59)	(0.37)	(-0.57)	(0.46)	(-0.12)	(-0.43)	(1.39)	(0.96)	(0.17)	(0.23)
Father/Mother dies=1 # GP: Inc (Q3)	0.047	0.147	0.005	0.004	0.003	0.016	0.041	-0.454	0.013	-0.002	0.009	0.017
	(1.01)	(0.38)	(0.78)	(0.34)	(0.30)	(1.67)	(0.57)	(-0.74)	(1.19)	(-0.11)	(0.52)	(1.12)
Father/Mother dies=1 # GP: Inc (Q4)	-0.009	0.085	0.007	0.012	-0.008	-0.001	0.07	-0.055	0.014	0.030*	0.022	0.013
	(-0.19)	(0.21)	(0.98)	(1.20)	(-0.76)	(-0.09)	(0.97)	(-0.09)	(1.31)	(1.99)	(1.31)	(0.85)
Observations	485,557	456,055	476,050	485,557	485,557	485,557	477,438	448,672	469,524	477,438	477,438	477,438
Adjusted R2	0.215	0.144	0.23	0.075	0.184	0.133	0.214	0.144	0.229	0.073	0.184	0.133

Note: the model includes controls for parents' SES (education, occupation, income), and birth year, gender, age at SES measurement, family size, parents' age at birth, and birth order. * p<0.05, ** p<0.01, *** p<0.001

Table S11. Within-family Analysis of Age of Father's Death by Father's and Mother's Income.

	Years of education, rank	ISEI, rank	GPA, rank	Upper-secondary, graduation	Tertiary, entry	Tertiary, graduation
Age when father dies	0.001	0.001	-0.001	0	-0.001	0
	(0.40)	(0.48)	(-0.92)	(-0.05)	(-0.22)	(0.01)
Age when father dies # F: Inc (Q2)	0.001	0	0.001	0.002	0.005	0.001
	(0.66)	(0.07)	(0.80)	(0.90)	(1.78)	(0.39)
Age when father dies # F: Inc (Q3)	0.002	0	0.003	0.004	0.002	0.001
	(0.97)	(0.09)	(1.79)	(1.53)	(0.50)	(0.44)
Age when father dies # F: Inc (Q4)	0	-0.002	0	0.001	0.003	-0.001
	(0.17)	(-0.86)	(-0.15)	(0.30)	(1.11)	(-0.29)
Age when father dies # M: Inc (Q2)	-0.001	0.001	0.002	0.001	-0.001	-0.002
	(-0.67)	(0.30)	(1.31)	(0.37)	(-0.46)	(-0.73)
Age when father dies # M: Inc (Q3)	-0.001	0.001	0	0	-0.001	-0.003
	(-0.64)	(0.33)	(0.20)	(0.11)	(-0.21)	(-0.96)
Age when father dies # M: Inc (Q4)	0	0.001	0.002	0.005*	0	0
	(-0.14)	(0.68)	(1.38)	(2.00)	(-0.06)	(-0.01)
Gender, birth order	Yes	Yes	Yes	Yes	Yes	Yes
Relative age interactions	Yes	Yes	Yes	Yes	Yes	Yes
Observations	341,139	320,117	335,827	341,139	341,139	341,139
Clusters	182,588	162,726	177,820	182,588	182,588	182,588
Adjusted R2	0.445	0.287	0.523	0.223	0.385	0.29

Note: * p<0.05, ** p<0.01, *** p<0.001

Table S12. Within-family Analysis of Age of Mother's Death by Father's and Mother's Income.

	Years of education, rank	ISEI, rank	GPA, rank	Upper-secondary, graduation	Tertiary, entry	Tertiary, graduation
Age when mother dies	0.001	0.002	0.001	0.003	0.005	0.001
	(0.64)	(0.81)	(0.35)	(1.08)	(1.17)	(0.16)
Age when mother dies # F: Inc (Q2)	0	0	-0.001	-0.003	0.004	0.003
	(0.10)	(-0.10)	(-0.24)	(-0.85)	(0.84)	(0.73)
Age when mother dies # F: Inc (Q3)	0.001	-0.001	0.002	0.002	0.007	0.002
	(0.30)	(-0.49)	(0.99)	(0.62)	(1.54)	(0.46)
Age when mother dies # F: Inc (Q4)	-0.001	0	0.002	0	0.002	-0.001
	(-0.24)	(0.07)	(1.09)	(0.03)	(0.43)	(-0.29)
Age when mother dies # M: Inc (Q2)	0.002	0.002	0.004	-0.001	0.003	0.004
	(1.09)	(0.55)	(1.87)	(-0.17)	(0.67)	(0.93)
Age when mother dies # M: Inc (Q3)	0	-0.001	-0.001	0.003	-0.005	-0.007
	(0.02)	(-0.18)	(-0.56)	(0.72)	(-1.07)	(-1.63)
Age when mother dies # M: Inc (Q4)	-0.002	-0.003	-0.002	0.001	-0.006	-0.002
	(-0.70)	(-0.90)	(-1.06)	(0.36)	(-1.33)	(-0.41)
Gender, birth order	Yes	Yes	Yes	Yes	Yes	Yes
Relative age interactions	Yes	Yes	Yes	Yes	Yes	Yes
Observations	341,139	320,117	335,827	341,139	341,139	341,139
Clusters	182,588	162,726	177,820	182,588	182,588	182,588
Adjusted R2	0.445	0.287	0.523	0.223	0.385	0.29

Note: * p<0.05, ** p<0.01, *** p<0.001

Table S13. Within-family Analysis of Age of Father's and Mother's Death by Aunts/Uncle's Income.

	Years of education, rank	ISEI, rank	GPA, rank	Upper-secondary, graduation	Tertiary, entry	Tertiary, graduation
Age when father dies	-0.002	-0.001	-0.003	-0.002	-0.006	-0.005
	(-1.21)	(-0.65)	(-1.46)	(-0.60)	(-1.93)	(-1.67)
Age when father dies # A/U: Inc (Q2)	0.002	0.003	0.002	0	0.007*	0.006*
	(1.22)	(1.50)	(1.35)	(-0.04)	(2.19)	(2.06)
Age when father dies # A/U: Inc (Q3)	0.005**	0.003	0.002	0.001	0.009**	0.008*
	(2.73)	(1.49)	(1.54)	(0.40)	(3.00)	(2.45)
Age when father dies # A/U: Inc (Q4)	0.005**	0.006**	0.002	-0.001	0.007*	0.009**
	(2.93)	(2.73)	(1.10)	(-0.33)	(2.07)	(2.77)
Gender, birth order	Yes	Yes	Yes	Yes	Yes	Yes
Relative age interactions	Yes	Yes	Yes	Yes	Yes	Yes
F M age dead SES interactions	Yes	Yes	Yes	Yes	Yes	Yes
Observations	300,949	283,790	296,984	300,949	300,949	300,949
Clusters	160,700	144,407	157,065	160,700	160,700	160,700
Adjusted R2	0.444	0.288	0.525	0.216	0.386	0.289
Age when mother dies	0.001	-0.002	0	0.001	0.003	0.001
	(0.32)	(-0.48)	(-0.01)	(0.18)	(0.53)	(0.12)
Age when mother dies # A/U: Inc (Q2)	-0.002	0.003	-0.002	0.003	-0.002	-0.003
	(-0.96)	(1.16)	(-0.93)	(0.92)	(-0.36)	(-0.61)
Age when mother dies # A/U: Inc (Q3)	-0.002	0.003	0	0.002	0.002	0.004
	(-1.00)	(0.86)	(0.13)	(0.51)	(0.47)	(0.87)
Age when mother dies # A/U: Inc (Q4)	0.001	0.005	0.003	0.001	0.002	0.002
	(0.60)	(1.69)	(1.34)	(0.40)	(0.45)	(0.54)
Gender, birth order	Yes	Yes	Yes	Yes	Yes	Yes
Relative age interactions	Yes	Yes	Yes	Yes	Yes	Yes
F M age dead SES interactions	Yes	Yes	Yes	Yes	Yes	Yes
Observations	300,497	283,373	296,543	300,497	300,497	300,497
Clusters	160,455	144,193	156,830	160,455	160,455	160,455
Adjusted R2	0.444	0.288	0.525	0.216	0.386	0.289

Note: * p<0.05, ** p<0.01, *** p<0.001

Table S14. Within-family Analysis of Age of Father's and Mother's Death by Grandparents' Income.

	Years of education, rank	ISEI, rank	GPA, rank	Upper-secondary, graduation	Tertiary, entry	Tertiary, graduation
Age when father dies	-0.001	0.001	-0.003	-0.004	-0.003	-0.003
	(-0.59)	(0.55)	(-1.64)	(-1.62)	(-0.91)	(-0.92)
Age when father dies # GP: Inc (Q2)	0.001	-0.001	0.001	0.002	0.003	0.003
	(0.55)	(-0.65)	(0.79)	(0.91)	(1.05)	(1.04)
Age when father dies # GP: Inc (Q3)	0	0	0.002	0.008***	0.001	0.004
	(-0.18)	(0.12)	(1.09)	(3.42)	(0.43)	(1.48)
Age when father dies # GP: Inc (Q4)	0.005***	0	0.004**	0.006*	0.006*	0.008**
	(3.33)	(-0.08)	(2.71)	(2.54)	(1.97)	(2.72)
Gender, birth order	Yes	Yes	Yes	Yes	Yes	Yes
Relative age interactions	Yes	Yes	Yes	Yes	Yes	Yes
F M age dead SES interactions	Yes	Yes	Yes	Yes	Yes	Yes
Observations	321,103	302,418	316,670	321,103	321,103	321,103
Clusters	171,464	153,758	167,428	171,464	171,464	171,464
Adjusted R2	0.443	0.288	0.524	0.217	0.386	0.289
Age when mother dies	-0.001	-0.002	-0.002	-0.001	-0.001	-0.003
	(-0.61)	(-0.52)	(-0.65)	(-0.20)	(-0.27)	(-0.70)
Age when mother dies # GP: Inc (Q2)	0.002	0.010***	0.004	0.004	0.009*	0.003
	(0.74)	(3.58)	(1.67)	(1.28)	(2.15)	(0.64)
Age when mother dies # GP: Inc (Q3)	0.004	0.004	0.003	0.008*	0.007	0.005
	(1.85)	(1.29)	(1.36)	(2.41)	(1.60)	(1.12)
Age when mother dies # GP: Inc (Q4)	0.004	0.003	0.003	0.010**	0.007	0.011**
	(1.76)	(1.06)	(1.22)	(2.69)	(1.55)	(2.61)
Gender, birth order	Yes	Yes	Yes	Yes	Yes	Yes
Relative age interactions	Yes	Yes	Yes	Yes	Yes	Yes
F M age dead SES interactions	Yes	Yes	Yes	Yes	Yes	Yes
Observations	321,103	302,418	316,670	321,103	321,103	321,103
Clusters	171,464	153,758	167,428	171,464	171,464	171,464
Adjusted R2	0.443	0.288	0.524	0.217	0.386	0.289

Note: * p<0.05, ** p<0.01, *** p<0.001