

## **Sooner, more, or no children? Timing and level of childbearing among orphans in France**

*Anne Solaz (Institut National d'Études Démographiques, INED)*

*& Eva Beaujouan (Vienna University of Economics and Business)*

### **Abstract**

Death of a parent in childhood has become rare but remains an important life-course event. It has short- and long-term repercussions for the child. Beyond psychological and developmental consequences, widely investigated, becoming an orphan also seems of consequence for own family construction and future fertility. In this paper, we aim to describe the link between parental death during childhood and later fertility behavior among women and men. The young adult who faces the psychological and health outcomes associated to parental loss may *retreat from parenthood*, notably because of specific anxieties and psychological distress. Conversely, forming a new family and having many children may be a way to *compensate* too early loss of a parent in childhood.

We use a very large national French dataset, the 2011 Family Survey (INSEE-INED), and focus particularly on the 1946-66 birth cohorts (N=118316), last generations for which we observe the entire fertility history, among which 11417 lost at least one parent during childhood. We perform linear and Poisson regressions on both timing and level fertility indicators.

Results show that orphans have larger offspring size than non-orphans, mainly explained by their individual characteristics for men. We find a strong polarization of fertility behaviors: while orphans are more likely to be childless, particularly men (*retreat from parenthood* assumption), those who become parent begin childbearing earlier and have more children in case of the death of the parent of the same sex as the respondent, following the *compensation* assumption.

**Keywords :** parental death, childbearing, fertility,

## INTRODUCTION

Death of a parent in childhood has become rare (Uhlenberg 1980), which does not make it less important. Perhaps even on the contrary, because of the weaker visibility of orphanhood in our contemporary societies and of the greater frailty of this population, studies of its consequences are particularly welcome (Leopold and Lechner 2015). In 2014 in the US, around 9% of adults aged 20-24 had lost at least a parent (Scherer and Kreider 2019) and in France around 6% of those aged 18-24 (Flammant 2019; Monnier and Pennec 2005). Father's loss is much more frequent than loss of the mother, and the loss of both parents is very rare (it concerns 5% of all orphans). UNICEF estimates that around 2 million children are without parental care in Europe and the U.S. (UNICEF/ISS 2004).

The financial and emotional consequences of the death of a parent in childhood make of orphans a particularly fragile group (Flammant 2019; Marks 2007), which triggers the need to explore factors revealing of their insertion in the society. Like the children of separated parents, orphans experience a spell living with a lone parent, and possibly with a step-parent (Reneflot 2011). But children who experience the death of a parent often require additional clinical assistance associated to their specific needs.

The death of a parent or of both parents has indeed short- and long-term repercussions for the child, and psychological and developmental consequences are widely investigated (see e.g. Stikkelbroek et al. 2012). Becoming an orphan also seems of consequence for own family construction (Reneflot 2011; Shenk and Scelza 2012; Tennant 1988) and for future fertility, a topic largely less investigated. Because of the familial disruption, the young adult may be more reluctant to form in turn a family because he displays larger perceived vulnerability to the death of relatives (Mireault and Bond 1992) and may have more often specific *anxieties* about parenthood. Conversely, forming a new family and having many children may be a way to counterbalance too early loss of a parent in childhood, by a *compensation effect*.

Up to now, literature on parental loss in childhood and fertility has focused mainly on early adult stages. Orphan children seek economic and household independence generally earlier than non-orphans (Kane and Gaskins 2010; Kiernan 1992; Shenk and Scelza 2012), and thus enter parenthood earlier (Kiernan 1992; Reneflot 2011). However, little is known about the fertile life that follows, and in particular, to what extent the earlier transition to parenthood observed among orphans converts into a more numerous offspring at the end of fertile life. If

there is a compensation mechanism, orphans who do start a family may even have more children than non-orphans who start a family at the same age. Furthermore, psychological disorders associated to parental loss in childhood (see e.g. Luecken 2008) may lead more orphans to forego childbearing, so one should also consider permanent childlessness to insure a complete story of fertility consequences of orphanhood. We investigate here the link between parental death in childhood and later fertility behavior among women and men considering different fertility indicators: timing of entry into parenthood, size of the initiated families, permanent childlessness, and total family size.

The lack of large data sources offering a long-term perspective has prevented in-depth studies of the link between orphanhood and future family construction. We use here a very large French dataset, the 2011 Family Survey (EFL, INSEE-INED), and focus particularly on the 1946-66 birth cohorts (N=118316), the most recent one for which we can observe the entire fertility history and calculate completed fertility. We study men and women separately, given their differential reaction to parental death (Leopold and Lechner 2015) and their distinct childbearing and family behaviors (Koropecj-Cox and Pendell 2007; Winkler-Dworak and Toulemon 2007). We distinguish between non-orphans and orphans, also detailing in the latter case their age when the parent died, and the sex of the deceased parent. We also control several possible confounding factors.

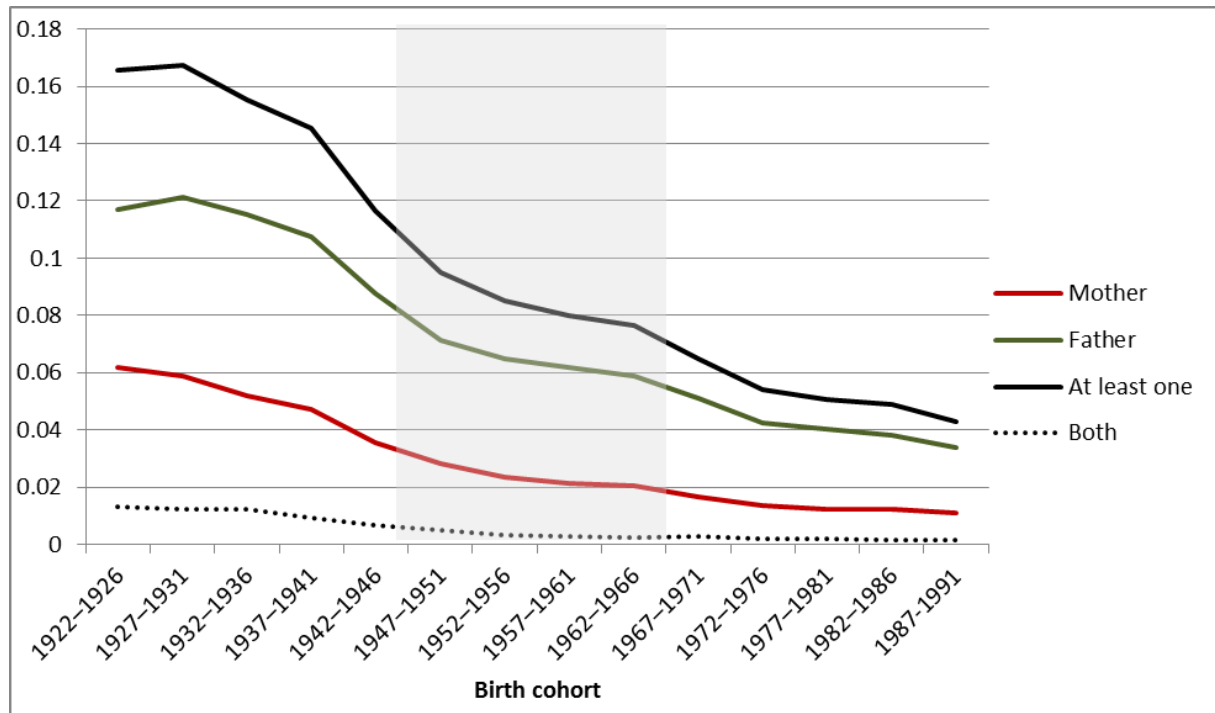
## BACKGROUND

### *Context*

Losing a parent during childhood was a common event for the generations whose parents went through World War I or II. More than 16% of French people born in the 1920s and still alive in 2011 had lost at least one parent before reaching age 18 (Figure 1). The death of parents during childhood became largely less common for cohorts over the century, but orphans still represent 6% in the late 1980s birth cohorts. The greyed zone highlights the cohorts born after World War II and aged at least 45 at survey time under study (1946-66). Though still a bit high in the first cohorts, death of parents was stabilizing across these cohorts. A new decrease followed, whose stabilization can be attributed to the slow down of the increase in life expectancy, reinforced by “childbearing postponement”: being born of

older parents mechanically increases the risk of losing a parent at an early age (Flammant 2019).

FIGURE 1. SHARE OF PERSONS BORN BETWEEN 1922 AND 1986, ALIVE IN 2011, WHO EXPERIENCED THE DEATH OF A PARENT BY THEIR 18<sup>TH</sup> BIRTHDAY (IN %).



Source: French Family Survey 2011 (INED-INSEE), authors' calculations.

### *Mechanisms behind childbearing outcomes*

In accordance with the literature on the effects of the death of a parent in childhood on adult outcomes, we consider that this death constitutes a “critical event” in the life course (Jost 2012; McLeod and Almazan 2003), and that it may impact the family formation process and subsequent fertility in two different directions. On the one hand, several studies pointed the implications of the death of a parent in childhood on later psychological and health outcomes. Adults who had lost at least one of their parents by death during childhood displayed larger perceived vulnerability to the death of relatives (Mireault and Bond 1992), had more often specific anxieties and substance use disorders (Stikkelbroek et al. 2012), and larger suicide rates (Guldin et al. 2015; Saarela and Rostila 2018). Although the overwhelming effect on

depression may have been largely overstated<sup>1</sup>, the psychological distress caused by parental death probably remained significant (Berg et al. 2016). This could then lead to lower likelihood to have any child, to later childbearing and to lower total number of children. We relate to that mechanism as *retreat from parenthood*.

In contrast, the experience of a parent's death may reinforce family values and the desire to form a family of one's own, resulting in larger likelihood to have a child, less delay in entering parenthood and larger family size. A positive relationship could stem from the larger belief that life is precious, a feeling shared by adults who have lost a parent in childhood, and their greater appreciation for loved ones (Greene and McGovern 2017). Those orphans who have reached adulthood may display a better ability to cope with adverse events (Finkelstein 1988), have developed a positive image of the missing parent (Cournos 2003; Menes Miller 1971). They may be more prone to have large families because of their larger life appreciation (Greene and McGovern 2017). Orphanhood can also trigger a need for creating links not experienced in childhood, or recreating links that have been suddenly interrupted by the parent's death (Hetherington 1972). To compensate for parental loss, they may want to have children to live themselves fully a family life. Overall, these effects would bring a larger share of them to start a family and they would have more children. We will talk about *compensation effect*.

Orphanhood may include many additional dimensions that are indirectly associated to future fertility behavior (mediators). Research shows that orphanhood triggers early life transitions (Shenk and Scelza 2012) and that orphan young adults make shorter studies (Kane and Gaskins 2010), have lower occupational position (Rosenbaum-Feldbrügge 2019) and leave the parental home earlier (Kiernan 1992). This could be due to the parental loss itself, or to the (negative) selection into orphanhood (Scherer and Kreider 2019). Notably, parental loss may be associated to a higher risk of child poverty (Flammant 2019) and have consequences in terms of educational attainment, particularly in countries with little welfare policies (Francesconi and Ermisch 2001). Those who ever lived in a single parent family had lower educational attainment (Ermisch and Francesconi 2000), as well as children who experienced the separation of their parents in childhood (Amato and Keith 1991; Wadsworth and Maclean 1986). In addition, childhood adversity may disturb the development of competencies

---

<sup>1</sup> More recent research pinpoints that most past studies were based on a selected sample of patients treated for psychological distress (Stikkelbroek et al. 2012; Tremblay and Israel 1998).

associated to educational achievements (Luecken and Roubinov 2012; Sandler 2001). For all these reasons, orphans are thus exposed to forming a family at an earlier age and to have their first child earlier (Kiernan 1992; Reneflot 2011). This earlier family formation schedule mechanically leads them to having more children, since those who form a family earlier have more children (Tomkinson 2019).

Finally, selection is an important aspect of orphanhood. Because of the socio-economic status gradient in mortality risk among young adults (Luy et al. 2011), orphans were coming more often from disadvantaged families (Flammant 2019; Monnier and Pennec 2005; Scherer and Kreider 2019). Poverty and unfavorable family circumstances were associated to negative emotional atmosphere or conflicts with the remaining parent, that involved early school leaving and early marriage (Berezkei and Csanaky 2001; Cherlin et al. 1995), and probably also other future family behaviors. Independent of socio-economic status, orphan's families may have other different characteristics that potentially affect child's development and adult behavior, many of which remain unobserved. For instance, the premature death of parents may be due to bad health outcomes, that could potentially affect child's outcomes including fecundability and fertility, particularly if the health problems have a genetic cause (Luecken and Roubinov 2012). We cannot control for selectivity in our models, but will take into account a range of observed characteristics (possible confounders) that contribute to the heterogeneity of the group.

We summarize here our hypotheses, considering that *retreat* and *compensation* do not necessarily play in the same way on the fertility timing and the fertility level.

(H1) If orphans tend to *retreat* from parenthood, they will be (a) more often childless and (b) delay entry into parenthood.

(H2) On the reverse, a *compensation effect* would (a) accelerate the timing of entry into parenthood in order to compensate parental loss. Independently from timing, (b) those who do form a family may have more children than the average.

#### *Results of the literature on disruption of parental union in childhood.*

Orphans constitute such a small group that data representative of the population are hardly available to study their behavior. Most empirical studies concentrate on the Nordic countries

and use register data, of sufficient size. Reneflot (2011) showed in Norway an earlier entry into parenthood for both women and men who had lost a parent in childhood, and orphan men were more likely to have a child before age 23. This was only partially explained by their lower educational level. While female age at first intercourse did not differ much for women whose parent died by age 16 compared to those in intact family, they were more likely to have a child before age 20 (Kiernan 1992; Kiernan and Hobcraft 2010). No significant association was found among men.

These studies focused on entry into parenthood but generally lacked the time window to study the effects of orphanhood over the whole reproductive life-span. Dahlberg (2018) recently focused on the experience of parental death in adulthood in Sweden, and found that those who had lost a parent during reproductive age were more likely to remain childless at age 45, and this effect was strongest among men. However, he only considered parental loss at adult age.

Finally, with the rise in parental separation, effects of death of a parent in childhood have sometimes been integrated into wider studies of marital breakdown. In general, studies focusing on parental separation in childhood find that children have more negative attitude towards family life (Axinn and Thornton 1996). A usual argument to explain the link between parental breakup and future behaviors is of *socialization*, that argues that parental models and supervision are primordial in explaining future family behaviors (McLanahan and Bumpass 2002). However, the hypothesis that the same family structure (lone parenthood after divorce or parental death) should lead to the same outcome is not verified for family outcomes (Cherlin et al. 1995; Kiernan 1992).<sup>2</sup> Sound comparisons between parental separation and parental death are also limited by the different socioeconomic backgrounds of the two populations, the differences in post-shock parental relationships<sup>3</sup>, and the expectedness of the break-up<sup>4</sup>.

---

<sup>2</sup> In addition, adults who lost a parent in childhood display educational and socio-economic outcomes closer to those who grew up in non-broken families than to those of divorced parents (Biblarz and Gottainer 2000)

<sup>3</sup> Orphans have a relationship with their remaining parent of better quality but higher levels of depression and lessened self-confidence (Mack 2001)

<sup>4</sup> Even if parental death could be in some cases anticipated (in case of lethal disease), it is a more exogenous event than parental separation.

### *Gender, age at parental death and sex of the deceased parent*

The reaction to the death of a parent is gendered, and also depends on the sex of the deceased parent (Hetherington 1972). This is the case in several domains of observation, and for instance at adult ages, life satisfaction was dropping most among women losing their mother (Leopold and Lechner 2015), while in terms of mortality risks men were more affected, and generally the effect of a mother's death was stronger than of a father's death (Rostila and Saarela 2011). Also, though risk of self-injuries increased for young men and women in case of parental loss, maternal loss before school age only had an effect on men (Rostila et al. 2016). Kane and Gaskins (2010) found that educational attainment diminished only when the parent who had died was of the same sex as the child. Related to family behaviors, women whose a parent was widowed had larger hazard to form a union than those of intact families, while the effect was not significant for men (Thornton 1991). We thus expect different effect by sex and depending on the sex of the deceased parent. Possibly, we also expect a different effect depending on whether one or both parents were dead.

The age at which the parent dies may also determine later behavior. If the parent dies while the child is still young, the mourning process may be quite specific. In addition, possibly the parent will have a new partner and the child a substitute parent (Graham 2010). On the other hand, if the parent dies while the child is in his teens, he will have known his deceased parent very well and be fully conscious of the loss. There is some evidence that parental death at very young ages is more detrimental to children's development and well-being (Hetherington 1972). Cerniglia (2014) showed that psychological welfare improved more at adolescence when the parent had died after the child was 3 than before.<sup>5</sup> Socio-economic outcomes in adulthood were significantly reduced when the parent (and particularly the mother) was dead before the child was ten (Rosenbaum-Feldbrügge 2019). Overall, we expect that the effect of the loss will vary with age, with more negative impact if the parent died while the child was very small and less negative if he was a teenager.

(H3) We expect that the effect of a parental death in childhood particularly depends on the age at parental death and on the sex of the deceased parent, in an interaction with the orphan's own gender.

---

<sup>5</sup> Also, in the case of divorce, purchase of antidepressant was more frequent when the divorce had taken place before age 5 than after age 15 (Kravdal and Grundy 2019).



## DATA AND METHOD

### *Data*

We use the French 2011 family survey (EFL, INSEE-INED). In the survey, respondents were asked for information about their mother and father. For each of them, they gave information about their country of birth, their citizenship at birth, their (past or present) employment and activity status, whether the parent was still alive, and if not they indicate the year of death. Respondents were asked specifically about the mother and father, but were given the possibility to answer about the person who had raised them. Children adopted at very early ages may thus more often have declared the date of death of their “social” parents rather than of their biological parents, but when one of the parents was still alive it is likely that there was no bias. Indeed, the overall good fit of these data with other existing ones, as checked by Flammant (2019), suggests that most parental deaths in childhood were declared.

In order to avoid parents’ death linked to the war and to focus on generations in which death of a parent had become relatively rare, we limit our sample to those born after the war (from 1946 onwards). This also limits the bias in survival due to differential mortality in respondents, which can be of concern in our case. Indeed, orphans are more likely to die early than other persons in a population (Li et al. 2014; Rostila and Saarela 2011) for several reasons (genetic disease, intergenerational transmission of health or risky behaviors, poverty risk). Thus, respondents who lost a parent during childhood may have also shorter life expectancy than those who did not, and respondents from older cohorts may be not observed in the dataset for that reason. This might be also the case in the cohorts studied, though in a more limited way, and we cannot exclude an underestimation and potential biases linked to differential mortality. In addition, we deal only with persons who have reached the end of their fertile years, so we select those aged at least 45 at survey.<sup>6</sup> All in all, in the generations under study (1946-66), one child out of ten experienced the death of at least one parent before age 20.

---

<sup>6</sup> Such a selection should not bias the fertility results, because in 1990 (and in most of the surrounding years that correspond to these cohorts childbearing ages), in most European countries less than 0.1% of the female Total Fertility Rate (TFR) was of children born after age 45, and around 2.5% of the male TFR (authors’ calculations from Human Fertility Database and male TFRs provided in Dudel and Klüsener (2018)).

## *Method*

We focus our study on indicators of timing and level of fertility both in the orphan population and in the non-orphan population, to compare them. More precisely, for men and women by age 45 we calculate total number of children, share childless, and number of children conditional on being a parent. We also calculate mean age at first birth, share becoming a parent before age 23 for men and women. The calculations are based on the full birth calendar available from the survey. After a first descriptive exploration of these indicators, we model the most relevant to our analysis so as to control for observable differences in characteristics of the orphans.

### **Models**

We model completed fertility (of all respondents and of parents only), using linear regressions. Alternative regressions with poisson regression have been performed and give very similar results. Childlessness is modelled using probit regressions. For timing, we use linear regressions of age at first birth. As we can observe the entire fertility period, there is no censorship and need to use survival analysis in that case.

### *Variable of interest*

We use the date of parental death available in the survey and recalculate the age of ego at the time of the death. From this, we consider that the respondent was an orphan if one of his/her parents died before he/she was 18. We differentiate whether the father or the mother died, or both, and eventually show an interaction of the sex of the parent with the age of the respondent when the parent died.

### *Other controls*

We control for birth cohort, first because there was a drop in fertility and childbearing postponement in the cohorts under study, and second because the reaction to parental death may have changed over time.

We then control for parental characteristics, i.e. occupation and country of birth of the parents. Parents occupational category is asked at present or in the past, so that a maximum of answers will be obtained. Still, it remains likely that orphans will declare less often their parent's socioeconomic position. We code separately this instance in a "not available" category.

Number of siblings is interesting as it could reflect whether there was a sibling to care (or help care) for the respondent in childhood. In addition, it is necessary to control for this in models of fertility, since future fertility depends on own sibship size. Possibly, this variable is correlated to the death of the parent (because there was less time for births in case of death in early childhood).

Finally, level of education of the respondent is a usual correlate of fertility levels, and may in addition be a mediator of childbearing timing (because those who finish their studies earlier start having children earlier). We thus control for level of education. In the models of total number of children conditional on being a parent, we also control for age at first birth, as this will mediate the relationship between orphanhood and family size.

Table A1 in appendix describes all the controls for the subpopulation of non orphans and orphans during childhood

## RESULTS

### *An earlier timing for orphans*

Table 1 (Descriptive table) describes diverse fertility outcomes for the whole population and for men and women separately, depending on the experience of parental death during childhood. Like past studies, our results show an earlier timing of entry in parenthood for orphans: they had their first child around one year earlier than non-orphans. They also more frequently had an early birth (before age 23). Particularly for women, the share of first births occurring before age 23 was 17% among non-orphans and around 26% among orphans. For men, the share also increased in case of parental loss, but the difference is significant only when the father has died, from 14 to 18%. Orphans were thus becoming parents earlier than the others, but the sex of the parent deceased was not of major importance for that aspect of childbearing.

The models on the timing of first birth (age at parenthood, Table 2) confirm that the death of a parent tended to accelerate the arrival of the first child and that orphans were more likely to enter parenthood very early. The addition of controls step by step diminished the effect of parental loss but the last model still showed significantly earlier first childbirth among female orphans regardless of the sex of the deceased parent. For men, the earlier birth timing was significant only in case of maternal loss. Part of the timing differences originally observed was thus due to socio-economic and cultural characteristics of orphans. As mentioned earlier, the early timing could be related to shorter studies (see Table A.2appendix): orphans study for a shorter time, so they possibly form a couple and have children earlier. Nonetheless, control for level of education decreased the association but it persisted.

The earlier timing observed for women and partly for men is in line with the compensation hypothesis, with a wish to build a new family as soon as possible. But we can ask whether orphans only shift their fertility schedules by having children sooner, or whether they actually have more children once they have started a family.

### *Family size for orphans who become parents*

If we count only adults who have started a family, thus excluding childless people, descriptive results (Table 1) show that individuals, particularly women, who lost at least a parent during childhood had the largest families. The number of children observed for parents of the cohorts studied was higher for orphans (2.45 for those who lost their mother, 2.38 for those who lost their father) than for non-orphans (2.28). Not only did orphans have children earlier, but they also had more children.

This larger family size could be due to their earlier timing that allows them a larger span to have children during the fertility period. That is why we controlled for age at first childbearing in the last specification (column 6). Table 3 on the number of children conditional on being parent confirms that, even after controlling for all characteristics and additionally for the age at entry into parenthood, orphans had effectively more children<sup>7</sup>. In other words, it confirmed a quantum effect beyond the timing effect. Earlier childbearing

---

<sup>7</sup> Timing of childbearing did not fully account for this difference, as control for age at first birth diminished but did not suppress this effect among women.

among orphans is one of the mechanisms leading to higher fertility of orphans, but not the only one. When we compare orphans to non-orphans who began parenthood at the same age, orphans still have more children.

However and interestingly, the effect remained significant only for the loss of the parent of the same sex as the respondent: Fathers who had lost their father had 0.05 more children than those who did not, while mothers who had lost their mother had 0.09 more children than those who did not. This gendered effect reinforces the interpretation in terms of compensation effect.

### ***Larger share of childless among orphans***

Looking at the likelihood to remain childless mitigates this picture, because orphans are also more likely to be childless than individuals whose parents were alive at age 17 (Table 1). The difference is particularly pronounced for men. While 17% of the men in the generations studied are childless among non-orphans, this percentage reaches almost 20% for those who lost their mother, and 19% for those who lost their father. Female orphans were remaining childless in almost the same proportion as non-orphans (12%), to the exception of those who had lost both parents during childhood (15%). Probit regression (Table 4) confirms the higher likelihood of childlessness among men whose father or mother had died, and no effect for female orphans to the exception of those who had lost both parents during childhood, once other characteristics were taken into account.

This result gives support to the assumption that parental loss is a critical event and has long-term consequences for some orphans, being more pronounced for men however. We cannot completely rule out alternative explanations to explain the association between childlessness and orphanhood. Higher childlessness may be linked to the negative selection of individuals coming from families with a parental death during childhood, as they may have different unobserved characteristics such as a poorer health (genetic disease) themselves. However, in that case men and women should see their childlessness risks increased in the same way, and this is not the case. The gendered results lead us to believe that the cause is rather social, and that the biological explanation is only marginal.

The bi-directional nature of the previous results, i.e. a lower likelihood of becoming parents but an accelerated timing and larger families for those who became parents, appealed for two

further investigations. First, do orphans have a larger offspring than non-orphans overall? And second, does it reflect heterogeneity in the reaction of orphans to parental death?

### ***Completed fertility***

Descriptive results (table 1) show that individuals who had lost only one parent during childhood had more children themselves once adult. This was the case for women whether the mother or the father had died and for men who had lost their father. Table 5 on the total number of children on the whole population shows, using linear regressions, how much the total number of children was sensitive to the death in childhood of one parent, once we controlled step by step for several characteristics. Male completed fertility was not affected by the parent's death, while orphan women had effectively more children. The death of the father was no longer significant after controls, while the death of the mother had a persistent effect even in the last model which included birth cohort, familial and individual characteristics: women who had lost their mother had 0.1 child more than non-orphans in average. Thus, to the exception of women orphan of mother, the total number of children of the whole population was very similar at the end among the two populations of orphans and non-orphans. The total fertility did not seem to be adequate as an indicator, and it was crucial to distinguish the likelihood of becoming parent from the timing and size of the offspring.

### ***Heterogeneity among orphans***

We already pointed that the fertility reaction to parental loss in childhood differed with the sex of the parent who died. They could differ in many other dimensions, and we explore some of them: age at parental loss, socio-economic status and number of siblings.

Table 6 shows the same models as presented above, but including the *age at parental death* interacted with the sex of the parent. After controls, we observed two age effects: women who had lost a mother in early childhood (0-6) or in adolescence (13-17) had larger family size (childless excluded) than non-orphans, and men who had lost a father in adolescence were more likely to be childless.

Regarding *socio-economic background* (Table 7), we observe that it was mostly when men were coming from a disadvantaged background that parental loss mattered : a larger family

size if the father died following the assumption of compensation and more often childless if the mother died. By contrast, among women the socio-economic background was not predicting different family size or childlessness in case of loss. Men coming from wealthier families may be more able to recover after parental loss than those coming from disadvantaged families, but for women the socio-economic background does not significantly play.

Again, women's reactions were little affected by the size of the family of origin, but men with siblings seemed to be more affected by parental death than only-children. Indeed, the positive effect of maternal death on family size seemed to be counterbalanced when male orphans had siblings, and they were also more often childless.

## DISCUSSION

To our knowledge, our study is the first one to look at the effect of orphanhood during childhood on the entire childbearing history. It brings forwards a very clear link between parental loss and childbearing behavior. Like in past studies, we find that those who have lost a parent during childhood accelerate childbearing (except men who have lost a father), and are more often early parents. This does not seem entirely mediated by their lower level of education (i.e. earlier school leaving). In addition, family size is larger among orphans who become parents (men who lost a father and women who lost a mother), even when controlling for age at first birth and all other characteristics. Finally, childlessness is more frequent among orphan men who have lost either their father or their mother, and also among women who have lost both their parents.

In general, childbearing outcomes do depend on the specificities of the loss: whether it was a boy losing his father or mother, or a girl. For each of the three fertility indicators under study the gendered effects varied in a coherent way. The age of the orphan when he/she lost his parent is also important, and there is more effect of the loss when it took place during adolescence than earlier. Finally, there is heterogeneity in family size and childlessness depending on the socio-economic background and the number of siblings, but only among men.

## Limitations

The lack of information about possible remarriage or repartnering of the remaining parent after his or her partner death is clearly a limitation of our study. However, Reneflot (2011) does not found significant differences on reproductive behavior in early adulthood of parental bereavement whether the remaining parent remarry or not, while they do find differences in case of remarriage after a marital separation. Another missing variable is whether the respondent has older or younger siblings, which could make a difference because older sibling may be substitute of parent while for younger, the respondent is likely to play the parental role himself. This measurement error could explain why results in the two subsamples divided by the number of siblings are not fully consistent.

## REFERENCES

- Amato, P. R., & Keith, B. (1991). Separation from a Parent during Childhood and Adult Socioeconomic Attainment. *Social Forces*, 70(1), 187–206.
- Axinn, W. G., & Thornton, A. (1996). The influence of parents' marital dissolutions on children's attitudes toward family formation. *Demography*, 33(1), 66–81. doi:10.2307/2061714
- Berezkei, T., & Csanaky, A. (2001). Stressful family environment, mortality, and child socialisation: Life-history strategies among adolescents and adults from unfavourable social circumstances. *International Journal of Behavioral Development*, 25(6), 501–508. doi:10.1080/01650250042000573
- Berg, L., Rostila, M., & Hjern, A. (2016). Parental death during childhood and depression in young adults – a national cohort study. *Journal of Child Psychology and Psychiatry and Allied Disciplines*, 57(9), 1092–1098. doi:10.1111/jcpp.12560
- Biblarz, T. J., & Gottainer, G. (2000). Family Structure and Children's Success: A Comparison of Widowed and Divorced Single-Mother Families. *Journal of Marriage and Family*, 62(2), 533–548. <https://www.jstor.org/stable/1566757>
- Cerniglia, L., Cimino, S., & Ballarotto, G. (2014). Parental Loss During Childhood and Outcomes on Adolescents' Psychological Profiles: A Longitudinal Study, 545–556. doi:10.1007/s12144-014-9228-3
- Cherlin, A. J., Kiernan, K. E., & Chase-Lansdale, P. L. (1995). Parental divorce in childhood and demographic outcomes in young adulthood. *Demography*, 32(3), 299–318. <http://www.ncbi.nlm.nih.gov/pubmed/8829968>
- Cournos, F. (2003). Mourning and Adaptation Following the Death of A Parent in Childhood. *Journal of the American Academy of Psychoanalysis*, 29(1), 137–145. doi:10.1521/jaap.29.1.137.17189
- Dahlberg, J. (2018). Death Is Not the End: A Register-Based Study of the Effect of Parental



- Death on Adult Children's Childbearing Behavior in Sweden. *Omega (United States)*. doi:10.1177/0030222818756740
- Dudel, C., & Klüsener, S. (2018). Estimating men's fertility from vital registration data with missing values. *Population Studies*. doi:10.1080/00324728.2018.1481992
- Ermisch, J., & Francesconi, M. (2000). The Increasing Complexity of Family Relationships: Lifetime Experience of Lone Motherhood and Stepfamilies in Great Britain. *European Journal of Population*, 16(3), 235–249.
- Finkelstein, H. (1988). The long-term effects of early parent death: a review. *Journal of Clinical Psychology*, 44(1), 3–9.
- Flammant, C. (2019). Approche démographique de l'orphelinage en France. *Ph.D. thesis in Demography, INED-CRIDUP*. <https://orphelins.site.ined.fr/fr/la-recherche/>
- Francesconi, M., & Ermisch, J. (2001). Family Matters: Impacts of Family Background on Educational Attainments. *Economica*, 68(270), 137–156. doi:Article
- Graham, R. (2010). The Stepparent Role: How It Is Defined and Negotiated in Stepfamilies in New Zealand. <http://researcharchive.vuw.ac.nz/handle/10063/1552>. Accessed 6 October 2013
- Greene, N., & McGovern, K. (2017). Gratitude, psychological well-being, and perceptions of posttraumatic growth in adults who lost a parent in childhood. *Death Studies*, 41(7), 436–446. doi:10.1080/07481187.2017.1296505
- Guldin, M. B., Li, J., Pedersen, H. S., Obel, C., Agerbo, E., Gissler, M., et al. (2015). Incidence of suicide among persons who had a parent who died during their childhood a population-based cohort study. *JAMA Psychiatry*, 72(12), 1227–1234. doi:10.1001/jamapsychiatry.2015.2094
- Hetherington, E. M. (1972). Effects of father absence on personality development in adolescent daughters. *Developmental Psychology*, 7(3), 313–326. doi:10.1037/h0033339
- Jost, G. (2012). Biographical structuring through a critical life event: parental loss during childhood. In K. B. Hackstaff, F. Kupferberg, & C. Négroni (Eds.), *Biography and turning points in Europe and America* (pp. 123–142). Bristol: The Policy Press.
- Kane, J., & Gaskins, R. R. (2010). The Effect of the Loss of a Parent on the Future Earnings of a Minor Child. doi:10.1057/ej.2010.25
- Kiernan, K. E. (1992). The impact of family disruption in childhood on transitions made in young adult life\*. *Population Studies*, 46(2), 213–234. doi:10.1080/0032472031000146206
- Kiernan, K. E., & Hobcraft, J. (2010). Parental Divorce during Childhood : Age at First Intercourse , Partnership and Parenthood Parental Divorce during Childhood : Age at First Intercourse , Partnership and Parenthood, 4728. doi:10.1080/0032472031000149716
- Koropecj-Cox, T., & Pendell, G. (2007). The gender gap in attitudes about childlessness in the United States. *Journal of Marriage and Family*, 69(November), 899–915. <http://onlinelibrary.wiley.com/doi/10.1111/j.1741-3737.2007.00420.x/full>. Accessed 12 November 2012
- Leopold, T., & Lechner, C. M. (2015). Parents' Death and Adult Well-being: Gender, Age, and Adaptation to Filial Bereavement. *Journal of Marriage and Family*, 77(3), 747–760. doi:10.1111/jomf.12186

- Li, J., Vestergaard, M., Cnattingius, S., Gissler, M., Bech, B. H., Obel, C., & Olsen, J. (2014). Mortality after Parental Death in Childhood: A Nationwide Cohort Study from Three Nordic Countries. *PLoS Medicine*, *11*(7). doi:10.1371/journal.pmed.1001679
- Luecken, L. J. (2008). Long-term consequences of parental death in childhood : Psychological and physiological manifestations. In M. S. Stroebe, R. O. Hansson, H. Schut, & W. Stroebe (Eds.), *Handbook of bereavement research and practice: advances in theory and intervention* (pp. 397–416). Washington D.C.: American Psychological Association. doi:10.1037/14498-019
- Luecken, L. J., & Roubinov, D. S. (2012). Pathways to Lifespan Health Following Childhood Parental Death. *Social and Personality Psychology Compass*, *6*(3), 243–257.
- Luy, M., Di Giulio, P., & Caselli, G. (2011). Differences in life expectancy by education and occupation in Italy, 1980-94: indirect estimates from maternal and paternal orphanhood. *Population Studies*, *65*(2), 137–155. doi:10.1080/00324728.2011.568192
- Mack, K. Y. (2001). Childhood family disruptions and adult well-being: the differential effects of divorce and parental death. *Death Studies*, *25*(5), 419–443. doi:10.1080/074811801750257527
- Marks, N. F. (2007). Death of Parents and Adult A Prospective U . S . National Study, 1611–1638. doi:10.1177/0192513X07302728
- McLanahan, S., & Bumpass, L. (2002). Intergenerational Consequences of Family Disruption. *American Journal of Sociology*, *94*(1), 130–152. doi:10.1086/228954
- McLeod, J. D., & Almazan, E. P. (2003). Connections between Childhood and Adulthood. In J. T. Mortimer & M. J. Shanahan (Eds.), *Handbook of the Life Course* (pp. 391–411). New York: Kluwer Academic/Plenum Publishers.
- Menes Miller, J. B. (1971). Children’s reactions to the death of a parent: a review of the psychoanalytic literature. *Journal of the American Psychoanalytic Association*, *19*(4), 697–719. doi:10.1353/imp.2000.0008
- Mireault, G. C., & Bond, L. A. (1992). Parental Death In Childhood: perceived vulnerability, and adult depression and anxiety. *American Journal of Orthopsychiatry*, *62*(4), 517–524. doi:10.1097/00131746-199911000-00004
- Monnier, A., & Pennec, S. (2005). Orphelins et orphelinage. In C. Lefèvre & A. Filhon (Eds.), *Histoires de familles, histoires familiales : les résultats de l’enquête Famille de 1999* (pp. 367–385). Ined.
- Reneflot, A. (2011). Childhood family structure and reproductive behaviour in early adulthood in Norway. *European Sociological Review*, *27*(1), 56–69. doi:10.1093/esr/jcp055
- Rosenbaum-Feldbrügge, M. (2019). The Impact of Parental Death in Childhood on Sons’ and Daughters’ Status Attainment in Young Adulthood in the Netherlands, 1850–1952. *Demography*, 1827–1854. doi:10.1007/s13524-019-00808-z
- Rostila, M., Berg, L., Arat, A., Vinnerljung, B., & Hjern, A. (2016). Parental death in childhood and self-inflicted injuries in young adults-a national cohort study from Sweden. *European Child and Adolescent Psychiatry*, *25*(10), 1103–1111. doi:10.1007/s00787-016-0833-6
- Rostila, M., & Saarela, J. M. (2011). Time does not heal all wounds: Mortality following the death of a parent. *Journal of Marriage and Family*, *73*(1), 236–249. doi:10.1111/j.1741-

- Saarela, J., & Rostila, M. (2018). Mortality after the death of a parent in adulthood: a register-based comparison of two ethno-linguistic groups. *European Journal of Public Health*, 0(0), 1–6. doi:10.1093/eurpub/cky189
- Sandler, I. (2001). Quality and Ecology of Adversity as Common Mechanisms of Risk and Resilience. *American Journal of Community Psychology*, 29(1), 19–55.
- Scherer, Z., & Kreider, R. M. (2019). Exploring the Link between Socioeconomic Factors and Parental Mortality. *SEHSD Working Paper 2019-12; SIPP Working Paper 288*.  
<https://www.census.gov/content/dam/Census/library/working-papers/2019/demo/sehswp2019-12.pdf>
- Shenk, M. K., & Scelza, B. A. (2012). Paternal Investment and Status-Related Child Outcomes: Timing of Father's Death Affects Offspring Success. *Journal of Biosocial Science*, 44(05), 549–569. doi:10.1017/S0021932012000053
- Stikkelbroek, Y., Prinzie, P., de Graaf, R., ten Have, M., & Cuijpers, P. (2012). Parental death during childhood and psychopathology in adulthood. *Psychiatry Research*, 198(3), 516–520. doi:10.1016/j.psychres.2011.10.024
- Tennant, C. (1988). Parental Loss in Childhood: Its Effect in Adult Life. *Archives of General Psychiatry*, 45(11), 1045–1050. doi:10.1001/archpsyc.1988.01800350079012
- Thornton, A. D. (1991). Influence of the Marital History of Parents on the Marital and Cohabital Experiences of Children. *The American Journal of Sociology*, 96(4), 868–894.
- Tomkinson, J. (2019). Age at first birth and subsequent fertility: The case of adolescent mothers in France and England and Wales. *Demographic Research*, 40(April), 761–798. doi:10.4054/DemRes.2019.40.27
- Tremblay, G. C., & Israel, A. C. (1998). Children's adjustment to parental death. *Clinical Psychology: Science and Practice*, 5(4), 424–438. doi:10.1111/j.1468-2850.1998.tb00165.x
- Wadsworth, M. E. J., & Maclean, M. (1986). Parents' Divorce and Children's Life Chances. *Children and Youth Services Review*, 8, 145–159.
- Winkler-Dworak, M., & Toulemon, L. (2007). Gender differences in the transition to adulthood in France: Is there convergence over the recent period? *European Journal of Population - Revue Européenne de Démographie*, 23(3–4), 273–314. doi:10.1007/s10680-007-9128-4

**Table 1.** Fertility Outcomes by parent's decease during childhood

	(1)	(2)	(3)	(4)
ALL	Both still alive at 17	Mother's death	Father's death	Both deceased
Age at first birth	26.08 (5.443)	25.13*** (5.334)	25.39*** (5.599)	24.96*** (5.514)
Early first childbearing	0.160 (0.367)	0.229*** (0.420)	0.223*** (0.416)	0.245*** (0.430)
Number of children excluding 0	2.277 (1.100)	2.454*** (1.309)	2.381*** (1.208)	2.318 (1.165)
<i>Observations</i>	<i>101894</i>	<i>2586</i>	<i>7159</i>	<i>368</i>
Number of children	1.961 (1.289)	2.087*** (1.491)	2.035*** (1.397)	1.952 (1.363)
Being childless	0.139 (0.346)	0.150* (0.357)	0.145* (0.352)	0.158 (0.365)
<i>Observations</i>	<i>118316</i>	<i>3041</i>	<i>8376</i>	<i>437</i>
<b>MEN</b>				
Age at first birth	27.89 (5.626)	27.35*** (5.398)	27.62** (5.956)	27.60 (5.925)
Early first childbearing	0.139 (0.346)	0.163 (0.370)	0.178*** (0.383)	0.190 (0.394)
Number of children excluding 0	2.269 (1.068)	2.349** (1.171)	2.371*** (1.190)	2.222 (1.050)
<i>Observations</i>	<i>34024</i>	<i>809</i>	<i>2359</i>	<i>126</i>
Number of children	1.878 (1.296)	1.883 (1.406)	1.928** (1.417)	1.842 (1.272)
Being childless	0.173 (0.378)	0.198** (0.399)	0.187** (0.390)	0.171 (0.378)
<i>Observations</i>	<i>41124</i>	<i>1009</i>	<i>2902</i>	<i>152</i>
<b>WOMEN</b>				
Age at first birth	25.17 (5.112)	24.12*** (4.991)	24.29*** (5.068)	23.58*** (4.749)
Early first childbearing	0.171 (0.377)	0.258*** (0.438)	0.244*** (0.430)	0.273*** (0.446)
Number of children excluding 0	2.280 (1.116)	2.502*** (1.364)	2.386*** (1.216)	2.368 (1.219)
<i>Observations</i>	<i>67870</i>	<i>1777</i>	<i>4800</i>	<i>242</i>
Number of children	2.005 (1.283)	2.188*** (1.522)	2.092*** (1.383)	2.011 (1.408)
Being childless	0.121 (0.326)	0.125 (0.331)	0.123 (0.329)	0.151 (0.359)
<i>Observations</i>	<i>77192</i>	<i>2032</i>	<i>5474</i>	<i>285</i>

Mean coefficients; Standard deviation in parentheses

Indicates significant differences when orphans differ from non-orphans (column 1)

**Table 2.** Age First birth (OLS regression) by Parent's death

	(1)	(2)	(3)	(4)	(5)
MEN	Null	+Cohort	+Parent	+Siblings	+Individual
Both still alive at 17	0.000 (.)	0.000 (.)	0.000 (.)	0.000 (.)	0.000 (.)
Mother deceased	-0.547** (0.201)	-0.472* (0.199)	-0.491* (0.195)	-0.468* (0.195)	-0.392* (0.193)
Father deceased	-0.277* (0.120)	-0.209+ (0.119)	-0.198+ (0.117)	-0.139 (0.117)	-0.059 (0.116)
Both deceased	-0.299 (0.504)	-0.087 (0.499)	-0.098 (0.490)	-0.043 (0.489)	0.082 (0.485)
N	37,318	37,318	37,318	37,318	37,317
r2	0.000	0.020	0.057	0.059	0.077
<b>WOMEN</b>					
Both still alive at 17	0.000 (.)	0.000 (.)	0.000 (.)	0.000 (.)	0.000 (.)
Mother deceased	-1.045*** (0.123)	-0.948*** (0.121)	-0.766*** (0.119)	-0.723*** (0.119)	-0.462*** (0.115)
Father deceased	-0.879*** (0.076)	-0.825*** (0.075)	-0.674*** (0.074)	-0.554*** (0.074)	-0.393*** (0.072)
Both deceased	-1.587*** (0.329)	-1.426*** (0.325)	-1.148*** (0.319)	-0.958** (0.317)	-0.674* (0.308)
N	74,689	74,689	74,689	74,689	74,688
r2	0.003	0.024	0.063	0.073	0.124

+ p&lt;.10, \* p&lt;.05, \*\* p&lt;.01, \*\*\* p&lt;.001

**Table 3.** Completed fertility conditional of parenthood (OLS regression), by parent's death

	(1)	(2)	(3)	(4)	(5)	(6)
MEN	Null	+Cohort	+Parent	+Siblings	+Individual	+age first child
Both still alive at 17	0.000 (.)	0.000 (.)	0.000 (.)	0.000 (.)	0.000 (.)	0.000 (.)
Mother deceased	0.079* (0.038)	0.077* (0.038)	0.044 (0.038)	0.034 (0.038)	0.027 (0.037)	0.006 (0.036)
Father deceased	0.102*** (0.023)	0.100*** (0.023)	0.084*** (0.023)	0.057* (0.023)	0.054* (0.022)	0.050* (0.022)
Both deceased	-0.047 (0.096)	-0.054 (0.096)	-0.080 (0.095)	-0.105 (0.094)	-0.106 (0.094)	-0.101 (0.090)
N	37,318	37,318	37,318	37,318	37,317	37,317
r2	0.001	0.001	0.035	0.048	0.051	0.128
WOMEN	(1)	(2)	(3)	(4)	(5)	(6)
	Null	+Cohort	+Parent	+Siblings	+Individual	+age first child
Both still alive at 17	0.000 (.)	0.000 (.)	0.000 (.)	0.000 (.)	0.000 (.)	0.000 (.)
Mother deceased	0.222*** (0.027)	0.220*** (0.027)	0.172*** (0.027)	0.159*** (0.026)	0.131*** (0.026)	0.094*** (0.025)
Father deceased	0.106*** (0.017)	0.105*** (0.017)	0.081*** (0.017)	0.045** (0.016)	0.028+ (0.016)	-0.003 (0.015)
Both deceased	0.087 (0.073)	0.085 (0.073)	0.045 (0.071)	-0.013 (0.071)	-0.040 (0.070)	-0.094 (0.066)
N	74,689	74,689	74,689	74,689	74,688	74,688
r2	0.001	0.002	0.039	0.058	0.069	0.185

+ p&lt;.10, \* p&lt;.05, \*\* p&lt;.01, \*\*\* p&lt;.001

**Table 4.** Probability of being Childless (logistic regression), by Parent's death

	(1)	(2)	(3)	(4)	(5)
MEN	Null	+Cohort	+Parent	+Siblings	+Individual
Both still alive at 17	0.000 (.)	0.000 (.)	0.000 (.)	0.000 (.)	0.000 (.)
Mother deceased	0.096* (0.046)	0.110* (0.046)	0.115* (0.046)	0.123** (0.046)	0.109* (0.046)
Father deceased	0.055* (0.028)	0.063* (0.028)	0.057* (0.028)	0.069* (0.028)	0.060* (0.028)
Both deceased	-0.006 (0.120)	0.010 (0.121)	0.007 (0.122)	0.012 (0.122)	0.003 (0.122)
N	45,187	45,187	45,187	45,187	45,185
r2					
<b>WOMEN</b>					
Both still alive at 17	0.000 (.)	0.000 (.)	0.000 (.)	0.000 (.)	0.000 (.)
Mother deceased	0.023 (0.036)	0.027 (0.036)	0.018 (0.036)	0.028 (0.036)	0.038 (0.037)
Father deceased	0.012 (0.023)	0.014 (0.023)	0.014 (0.023)	0.034 (0.023)	0.042+ (0.023)
Both deceased	0.139 (0.091)	0.145 (0.091)	0.159+ (0.091)	0.192* (0.091)	0.209* (0.091)
N	84,983	84,983	84,983	84,983	84,982
r2					

+ p&lt;.10, \* p&lt;.05, \*\* p&lt;.01, \*\*\* p&lt;.001

**Table 5.** Completed fertility, by Parent's death

	(1)	(2)	(3)	(4)	(5)
<b>MEN</b>	Null	+Cohort	+Parent	+Siblings	+Individual
Both still alive at 17	0.000 (.)	0.000 (.)	0.000 (.)	0.000 (.)	0.000 (.)
Mother deceased	0.005 (0.042)	-0.003 (0.042)	-0.028 (0.041)	-0.046 (0.041)	-0.045 (0.041)
Father deceased	0.050* (0.025)	0.044+ (0.025)	0.035 (0.025)	0.006 (0.025)	0.008 (0.025)
Both deceased	-0.035 (0.106)	-0.052 (0.106)	-0.086 (0.105)	-0.103 (0.104)	-0.098 (0.104)
N	45,187	45,187	45,187	45,187	45,185
r2	0.000	0.004	0.026	0.036	0.036
<b>WOMEN</b>					
Both still alive at 17	0.000 (.)	0.000 (.)	0.000 (.)	0.000 (.)	0.000 (.)
Mother deceased	0.183*** (0.029)	0.180*** (0.029)	0.143*** (0.029)	0.127*** (0.029)	0.098*** (0.028)
Father deceased	0.087*** (0.018)	0.085*** (0.018)	0.066*** (0.018)	0.025 (0.018)	0.009 (0.018)
Both deceased	0.006 (0.077)	0.001 (0.077)	-0.044 (0.076)	-0.108 (0.075)	-0.140+ (0.075)
N	84,983	84,983	84,983	84,983	84,982
r2	0.001	0.001	0.027	0.046	0.054

+ p&lt;.10, \* p&lt;.05, \*\* p&lt;.01, \*\*\* p&lt;.001



**Table 6.** Different fertility outcomes, by age at parental death

	(1)	(2)	(3)	(4)
MEN	CF for parents No control	CF for parents Controls	Childlessness No controls	Childlessness Controls
<b>Mother</b>				
0-6	0.092 (0.069)	-0.001 (0.065)	0.024 (0.085)	0.033 (0.086)
7-12	0.028 (0.059)	-0.041 (0.055)	0.081 (0.071)	0.096 (0.071)
13-17	0.040 (0.058)	0.001 (0.054)	0.108 (0.068)	0.120+ (0.068)
Still Alive at 17	0.000 (.)	0.000 (.)	0.000 (.)	0.000 (.)
<b>Father</b>				
0-6	0.136** (0.043)	0.057 (0.040)	-0.044 (0.055)	-0.037 (0.056)
7-12	0.061 (0.038)	0.007 (0.036)	-0.003 (0.048)	-0.001 (0.048)
13-17	0.087* (0.034)	0.062+ (0.032)	0.132*** (0.040)	0.136*** (0.040)
Still Alive at 17	0.000 (.)	0.000 (.)	0.000 (.)	0.000 (.)
N	37,318	37,317	45,187	45,185
r2	0.001	0.128		
<b>WOMEN</b>				
<b>Mother</b>				
0-6	0.230*** (0.049)	0.094* (0.045)	-0.102 (0.070)	-0.098 (0.071)
7-12	0.117** (0.044)	0.014 (0.040)	0.106+ (0.056)	0.128* (0.056)
13-17	0.232*** (0.040)	0.105** (0.036)	0.056 (0.052)	0.081 (0.052)
Still Alive at 17	0.000 (.)	0.000 (.)	0.000 (.)	0.000 (.)
<b>Father</b>				
0-6	0.098** (0.033)	-0.027 (0.030)	0.037 (0.044)	0.058 (0.044)
7-12	0.117*** (0.028)	0.010 (0.025)	-0.004 (0.037)	0.024 (0.038)
13-17	0.075** (0.025)	-0.021 (0.022)	0.023 (0.033)	0.063+ (0.033)
Still Alive at 17	0.000 (.)	0.000 (.)	0.000 (.)	0.000 (.)
N	74,689	74,688	84,983	84,982
r2	0.001	0.185		

+ p&lt;.10, \* p&lt;.05, \*\* p&lt;.01, \*\*\* p&lt;.001

CF= Completed fertility

**Table 7.** Different fertility outcomes by family background (SES and sibship size)

<b>MEN</b>				
<b>CF for parents</b>	(1) SES disadvantaged	(2) Not disadvantaged	(3) Only Child	(4) Siblings
Both still alive at 17	0.000 (.)	0.000 (.)	0.000 (.)	0.000 (.)
Mother deceased	-0.027 (0.060)	0.025 (0.052)	0.220* (0.110)	-0.008 (0.038)
Father deceased	0.098** (0.035)	0.008 (0.032)	0.078 (0.074)	0.070** (0.023)
Both deceased	-0.187 (0.147)	0.135 (0.140)	0.165 (0.349)	-0.099 (0.094)
N	13,195	17,468	3,211	34,106
r2	0.141	0.118	0.159	0.117
<b>Childlessness</b>				
Being childless				
Both still alive at 17	0.000 (.)	0.000 (.)	0.000 (.)	0.000 (.)
Mother deceased	0.219** (0.073)	0.085 (0.073)	-0.163 (0.151)	0.127** (0.048)
Father deceased	0.044 (0.046)	0.077+ (0.045)	0.173+ (0.090)	0.036 (0.030)
Both deceased	0.288+ (0.174)	-0.173 (0.222)	0.164 (0.457)	0.003 (0.126)
N	15,820	21,056	4,093	41,092
<b>WOMEN</b>				
<b>CF for parents</b>	SES disadvantaged	Not disadvantaged	Only Child	Siblings
Both still alive at 17	0.000 (.)	0.000 (.)	0.000 (.)	0.000 (.)
Mother deceased	0.123** (0.041)	0.090* (0.037)	0.181* (0.083)	0.091*** (0.026)
Father deceased	0.008 (0.025)	-0.011 (0.023)	-0.016 (0.054)	0.021 (0.016)
Both deceased	0.071 (0.106)	-0.158 (0.102)	0.030 (0.296)	-0.065 (0.068)
N	27,716	34,356	5,943	68,745
r2	0.191	0.154	0.222	0.172
<b>Childlessness</b>				
Both still alive at 17	0.000 (.)	0.000 (.)	0.000 (.)	0.000 (.)
Mother deceased	-0.014 (0.063)	0.083 (0.058)	0.144 (0.102)	0.013 (0.039)
Father deceased	0.075* (0.037)	0.091* (0.036)	0.019 (0.070)	0.029 (0.024)
Both deceased	0.246+ (0.146)	0.243 (0.149)	0.517+ (0.309)	0.164+ (0.096)
N	30,850	39,256	7,273	77,709

+ p&lt;.10, \* p&lt;.05, \*\* p&lt;.01, \*\*\* p&lt;.001

CF= Completed fertility

## Appendix

**Table A1.** Controls by parent's decease during childhood

	(1) Both still alive at 17	(2) Mother's death	(3) Father's death	(4) Both deceased
1940	0.182 (0.386)	0.233 (0.423)	0.215 (0.411)	0.259 (0.438)
1950	0.468 (0.499)	0.461 (0.499)	0.463 (0.499)	0.474 (0.500)
1960	0.350 (0.477)	0.306 (0.461)	0.322 (0.467)	0.268 (0.443)
Mother Never Worked	0.363 (0.481)	0.487 (0.500)	0.313 (0.464)	0.497 (0.501)
Mother Farmer	0.0917 (0.289)	0.0691 (0.254)	0.0765 (0.266)	0.0549 (0.228)
Mother Independent	0.0547 (0.227)	0.0427 (0.202)	0.0509 (0.220)	0.0526 (0.224)
Mother White Collar	0.0107 (0.103)	0.00592 (0.0767)	0.00943 (0.0967)	0.00229 (0.0478)
Mother Blue Collar	0.0566 (0.231)	0.0335 (0.180)	0.0407 (0.198)	0.0320 (0.176)
Mother Clerk	0.193 (0.395)	0.0891 (0.285)	0.233 (0.423)	0.103 (0.304)
Mother Manual Worker	0.0952 (0.294)	0.0635 (0.244)	0.125 (0.331)	0.0870 (0.282)
Mother NA	0.135 (0.342)	0.209 (0.407)	0.152 (0.359)	0.172 (0.377)
Father Never Worked	0.00765 (0.0871)	0.0145 (0.119)	0.0140 (0.117)	0.0137 (0.117)
Father Farmer	0.117 (0.322)	0.107 (0.309)	0.103 (0.304)	0.0961 (0.295)
Father Independent	0.105 (0.307)	0.0950 (0.293)	0.0844 (0.278)	0.0778 (0.268)
Father White Collar	0.0749 (0.263)	0.0490 (0.216)	0.0470 (0.212)	0.0366 (0.188)
Father Blue Collar	0.0893 (0.285)	0.0654 (0.247)	0.0506 (0.219)	0.0481 (0.214)
Father Clerk	0.0853 (0.279)	0.0710 (0.257)	0.0882 (0.284)	0.0961 (0.295)
Father Manual Worker	0.347 (0.476)	0.371 (0.483)	0.385 (0.487)	0.403 (0.491)
Father NA	0.173 (0.378)	0.227 (0.419)	0.227 (0.419)	0.229 (0.421)
Mother France and miss	0.828 (0.377)	0.800 (0.400)	0.803 (0.398)	0.778 (0.416)
Mother Southern Europe	0.0492 (0.216)	0.0503 (0.219)	0.0501 (0.218)	0.0526 (0.224)
Mother Rest Europe	0.0277 (0.164)	0.0316 (0.175)	0.0290 (0.168)	0.0366 (0.188)

Mother North Africa	0.0580 (0.234)	0.0674 (0.251)	0.0704 (0.256)	0.0595 (0.237)
Mother Rest of World	0.0367 (0.188)	0.0506 (0.219)	0.0473 (0.212)	0.0732 (0.261)
Father France and miss	0.819 (0.385)	0.790 (0.407)	0.791 (0.407)	0.771 (0.421)
Father Southern Europe	0.0562 (0.230)	0.0585 (0.235)	0.0608 (0.239)	0.0595 (0.237)
Father Rest Europe	0.0278 (0.164)	0.0309 (0.173)	0.0287 (0.167)	0.0252 (0.157)
Father North Africa	0.0605 (0.238)	0.0691 (0.254)	0.0714 (0.257)	0.0618 (0.241)
Father Rest of World	0.0366 (0.188)	0.0516 (0.221)	0.0482 (0.214)	0.0824 (0.275)
Number of siblings	3.165 (2.623)	3.684 (2.961)	3.768 (2.999)	4.160 (3.284)
Primary	0.322 (0.467)	0.466 (0.499)	0.421 (0.494)	0.485 (0.500)
Secondary	0.446 (0.497)	0.380 (0.486)	0.420 (0.494)	0.403 (0.491)
Tertiary	0.232 (0.422)	0.153 (0.360)	0.159 (0.366)	0.112 (0.316)
Observations	118316	3041	8376	437

**Table A2.** Multinomial model on the level of education by parent's decease during childhood

	(1) Men			(2) Women		
	Primary	Upper_sec ndary	Tertiary	Primary	Upper_sec ondary	Tertiary
Both still alive at 17	0.000 (.)	0.000 (.)	0.000 (.)	0.000 (.)	0.000 (.)	0.000 (.)
Mother deceased	0.318*** (0.072)	0.000 (.)	-0.117 (0.096)	0.453*** (0.052)	0.000 (.)	-0.199** (0.073)
Father deceased	0.168*** (0.044)	0.000 (.)	-0.249*** (0.059)	0.240*** (0.032)	0.000 (.)	-0.185*** (0.043)
Both deceased	0.085 (0.181)	0.000 (.)	-0.578* (0.270)	0.413** (0.135)	0.000 (.)	-0.476* (0.217)
N	45,185			84,982		
r2						

All controls included

+ p&lt;.10, \* p&lt;.05, \*\* p&lt;.01, \*\*\* p&lt;.001