Impact of Parental Death in Middle Childhood and Adolescence on Child Outcomes

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Abstract

This paper investigates whether the death of a parent during middle childhood (ages 7-8 to 11-12) has different effects on a child's schooling and psychosocial outcomes compared to death during adolescence (ages 11-12 to 14-15) in Ethiopia. The data comes from three rounds of the Young Lives longitudinal survey, conducted in 2002, 2006 and 2009, of a sample of around 850 children across 20 sentinel sites in Ethiopia. The results show that when a child's mother dies in middle childhood it has a significantly negative impact on school enrolment. . A parent's death also has a significant negative impact on a child's sense of optimism about the future. These effects are short term in nature and do not persist into adolescence. However, the children orphaned in middle childhood engage in significantly more paid employment and self employment at age 14-15. In contrast to maternal death in middle childhood, maternal death in adolescence has no impacts on any of the outcomes considered in our sample. However, the death of a father in adolescence has a significant negative impact on school enrolment, maths scores and a child's sense of agency. It is unclear as to why this is the case, as these orphans do not seem to engage in more employment than others and there have been no significant disruption to caregiver arrangements. It is likely that the negative impact on enrolment and scores works though the lower sense of self efficacy or agency.

1. Introduction

Losing a parent as a child can often lead to significant negative impacts on a child's short and long-term welfare. The empirical literature suggests that one such impact is on the accumulation of human capital, often proxied by school enrolment or attainment that can be significantly reduced following parental death (World Bank 1999; Ainsworth, Beegle and Koda 2005; Case, Paxson and Ableidinger 2002; Yamano and Jayne 2005, Evans and Miguel 2007). Some of these studies also argue that the gender of the parent that died is important, with the death of the mother having a greater impact on welfare outcomes than that of the father. For example Beegle et. al (2006) argue that maternal death, particularly that occurring before the child is 15 years of age pronounced have negative implications for a child's health and educational outcomes. Similarly Chen et. al (2009) show that the unexpected death of a mother has a much larger impact on College enrolment than the loss of a father in Taiwan. There are very few empirical studies, however, on the psychosocial impact of orphan hood on children. In the psychological literature, studies such as Bhargava (2005) and Cluver (2007) suggest orphans may score lower in indicators constructed to reflect social and emotional adjustment and are more likely to report symptoms of depression, peer relationship problems and post-traumatic stress. However, clear empirical evidence establishing a causal impact of death on such psychosocial outcomes is not available. There is also very little empirical analysis that looks specifically at the impact parental death has on child outcomes depending on the stage of childhood.

Parental death is a risk faced by children in Ethiopia, comparable to much of Africa in recent times, especially due to the HIV/AIDS pandemic and the risk of associated opportunistic infections such as tuberculosis. Although the adult HIV rate in Ethiopia of 1.4% in 2005 is low compared to some areas in Africa, the Ministry of Health estimates that between 800,000 and 1.2 million children have been orphaned due to AIDS (Central Statistical Agency-Ethiopia and ORC Macro 2006). Around 4.6 million or roughly 10 per cent of all children are orphans although for some age groups the percentage is as high as 24 per cent. Comparable to these figures, roughly 10 per cent of the children in the *Young Lives* sample we use in this paper, had lost one or both parents in 2002, when the first round of data was collected. By 2006 one in five children

had lost either their mother or father[1] By the time of the 3rd round of data was collected in 2009, one in four children had lost at least one parent.

This paper looks at whether the impact of parental death on child outcomes are age dependent: Does a parent dying in middle childhood when a child is aged between 7 to 12 years have effects different to parental death in adolescence when a child is aged between 12 to 15 years? The paper also looks at whether the observed effects are a short term phenomena or persist in the longer term. The paper uses *Young Lives* longitudinal data for Ethiopia for around 850 children collected in 2002,2006 and 2009 across 20 sentinel sites. The outcomes considered are education in terms of quantity (school enrolment) and quality (i.e., ability to read, write and numeracy conditioned on the number of years of schooling, cognitive and maths scores). By using measures of educational outcome beyond simply school enrolment, the paper attempts to address an important shortcoming in most of the existing empirical literature on orphan hood. Most papers use school enrolment as a measure of outcome without addressing the issue that enrolment hardly measures quality of schooling. Enrolment is also a weak proxy for educational achievement or human capital, especially in the African context where it is fairly common to postpone schooling, start school late or even to interrupt it. Uniquely, the paper also looks at outcomes in terms of child subjective well-being (SWB), broadly defined as a child's own evaluation of his or her life (used to construct an index of a child's sense of optimism) as well as psychosocial characteristics such as the child's sense of self esteem and agency (or self efficacy). This is a little explored area in the empirical literature on orphans.

The main challenge in the empirical analysis is to account for the possible endogeneity of parental death. It is highly likely that parental death is not a random occurrence, but one closely associated with behavioural choices that affect both the incidence of death and schooling outcomes. If parental death is associated with individual and household characteristics such as wealth and mobility –that also influence schooling and psychosocial outcomes- not controlling for these may lead to

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[1] These parental mortality figures match adult mortality rates discussed in the DHS data for 2005. The DHS indicates that adult mortality rates for the 40-49 age group for men is around 9% while for females of the 35 – 39 age group was 8%. In our sample, the average age of mothers was 34 and for fathers 43, in round 1. The percentage of these adults that died by 2006 was 10 per cent, comparable to DHS adult mortality rates by age.

a biased estimate of the impact of death on outcomes. We account for such possible endogeneities by exploiting the panel dimension of the data and looking at the impact pre-orphan hood characteristics (i.e., round 1 data) had on outcomes after the shock (i.e., round 2 outcomes). Another problem with trying to estimate the impact of parental death is that there could be unobservables correlated with parental death to bias results. To account for this we look at the impact of future orphan status on outcomes at the baseline (round 1 for the middle childhood analysis and round 2 for the adolescent analysis). If future orphan status is significant to baseline outcomes, this implies either that there are parental death captures unobservables we cannot control or parental death had impacts on child outcomes even before the death occurred. The latter could be due perhaps to parents being ill before death, with children having to spend time looking after them or parents not being able to contribute to household resources due to illness. We also use the very rich information on child, household and community characteristics to control in our estimations and descriptive analysis to glean insights as to how and why parental death may affect certain child outcomes.

The paper is organised as follows. The next section at the data and descriptive statistics. Section 3 looks at the empirical strategy while section 4 looks at the results, supported by several checks for robustness. It also includes a detailed consideration of time use between orphans and non-orphans. Section 5 concludes.

2. Data and descriptive statistics

The data for this paper comes from the *Young Lives* project managed by the University of Oxford. The quantitative part of the project tracks 12 000 children over 15 years in 4 countries (Ethiopia, Peru, Vietnam and India-Andhra Pradesh) starting in 2002. The project has so far completed 3 rounds of data collection in 2002, 2006 and 2009. The surveys focus on 2 cohorts of children: the older cohort born in 1994 (a sample of 1000) children and the younger cohort born in 2000 (a sample of 2000 children). This paper focuses only in the older cohort, since they were the group that were eligible to have started schooling in both rounds.

The children in our sample were 7–8 years old in 2002 when round 1 data was collected,11–12 years old at the time of round 2 and 14-15 at the time of round 3. Only households that had a child in the relevant age group was selected for the study as Young Lives is a panel study that intends to follow the individual child over his life

course from 2002 to 2015, rather than follow the household. The sample selection methodology adopted is known as sentinel site surveillance system   Under this methodology, 20 sentinel sites were selected across five regions- Addis Ababa, Amhara, Tigray, Oromia and Southern Nations Nationalities and People Region.   . These five regions, selected out of 11, account for 96 per cent of Ethiopia's population. The selection of sentinel sites followed a purposive strategy with districts with food deficiency status over-sampled, as the study's aim is to investigate childhood poverty. However, the challenging topography of rural Ethiopia together with, practical and budgetary constraints of interviewing and re-interviewing 3 years later led to the selection of rural sentinel sites that were well defined with relatively better transport, communications and services.   Household selection within the sentinel site was random. It was attempted, as far as possible, to select districts and sites that reflected Ethiopia's diversity across regions and ethnicities in both rural and urban areas[2].

Outes and Sanchez (2008) use two nationally representative comparison samples, the Demographic and Health Survey 2000 (DHS) and the Welfare Monitoring Survey 2000 (WMS), and compare, inter alia, the Young Lives baseline sample in round 1 against these. They use variables that are common in the three surveys such as area of residence, access to electricity, access to drinking water and the wealth index. In order to ensure comparability,   the comparison samples were constrained to accommodate the fact that the Young Lives sample only includes households with at least one child aged between 6 and 18 months or aged 8. The analyses showed that households in the Young Lives sample were slightly better-off in terms of access to basic services than the average household in Ethiopia, as measured by the nationally representative DHS and the WMS. However, they hold less land, less livestock and are less likely to own their own house than the average Ethiopia household. This evidence is consistent with the sampling methodology applied. Despite these biases, it is shown that the Ethiopian Young Lives sample covers the diversity of children in the country in terms of wealth, consumption, health, nutrition, education and access to education, similar to nationally representative data sets.. Therefore, 'while not suited for simple monitoring of child outcome indicators, the Young Lives sample will be an appropriate

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[2] The sentinel sites chosen are not the same as the enumeration areas or Woredas of the Central Statistical Agency in Ethiopia. The former is larger with up to 2000 households while the latter has 250 households.

and valuable instrument for analysing causal relations, modelling child welfare, and its longitudinal dynamics in Ethiopia' (Outes-Leon and Sanchez 2008: 3).

Round 1 started with 1000 children, but by Round 2 the sample had reduced to 981 due to attrition and by round 3 to 973. Unfortunately we do not have information as to whether the 27 children lost due to attrition were orphaned between the rounds or not. Thus it is difficult to say if sample attrition was non-random. However, we can run a probit regression with the dependent variable indicating whether or not a child was 'lost' between rounds one and three, with the independent variables being baseline covariates such as child characteristics (gender, health), household characteristics (wealth, household size, care giver schooling, ethnicity and religion of head, rural/urban residence) and caregiver arrangements (i.e., main care giver is the mother, the child sees the father daily, the marital status of the caregiver) . The regression results (unreported)indicate that attrition was *not* related to observable baseline covariates. Thus we assume that sample attrition is random, and that variables affecting attrition are not correlated with the outcome variables. We also note that overall rate of attrition between 2002 and 2009 is 2.1 per cent (excluding death), which is quite low for a longitudinal study.

Of the 981 children available for re-interview in round 2, 120 had already lost one or both parents by Round 1 while four others had lost both parents between rounds. Since pre-orphan hood characteristics are not available for these children they are excluded from the analysis[3]. Of the remaining 857 children -who had both parents in Round 1- 57 had lost their father and 19 had lost their mother by Round 2.

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[3] Of the 120 who had already lost a parent by round 1, 88 had lost the father, 22 had lost the mother and 10 had lost both parents. Between round one and two, 13 of the children who had lost the father went on to lose the mother and 4 of the children who had lost the mother went on to lose the father. These children do not differ significantly in terms of school enrolment or anthropometric outcomes in round 1 or round 2 compared to those who have both parents alive. At round 1, the mother is the main caregiver for 86 per cent of those who have lost a father. The father, step mother or grandmother is the main caregiver for nearly 80 per cent of those who had already lost their mother at round 1. Those who lost their mother are in households that are significantly wealthier than households where both parents are alive or one where the father is dead but the mother is the main carer. Those who lost the father before round one are households that are significantly smaller compared to those with both parents alive.

The round 3 survey interviewed 973 children. To compare at the impact of parental death on adolescent children, we will only use those children who had both parents alive at round 2 and 3 (748) and those that lost only the mother between these rounds (12 in our sample) and those that lost only the father (20 in our sample). This sample excludes any children who had already lost a parent by round 2.

2.1. Middle Childhood: Child outcomes at age 11-12 and baseline individual/household characteristics at age 7-8

Table 1a compares education, SWB and psychosocial outcomes of children who lost a parent in middle childhood and those who did not. In Ethiopia, cycle 1 of formal schooling starts around age 7–8 (around the time of Round 1) and lasts four years with no grade retention until after cycle 2 commences, usually around age 12. Of course, later enrolment is possible, but our sample suggests that the average age of starting school is around 8 years old.

It is immediately obvious from table 1a that school enrolment in Round 2 is quite high at 95 per cent for children with both parents but significantly lower at just 78 per cent for those who had lost their mother. Moreover, those who lost their mother between rounds also miss school more than the group that lost their father or did not lose either parent. There is no significant difference in the years of completed education or the years completed if the child dropped out. The data set also contains information regarding a child's reading and writing ability at Round 2. In order to assess quality of education received (both formal and informal if children do not attend school), all children were asked to read and write two simple sentences. The level of reading is coded from 1 to 4, as cannot read anything, reads only letters, reads only words and reads only sentences respectively. Quite strikingly, the proportion of children who lost their mother who cannot read anything or only letters rather than words or sentences at age 11–12 is a high 42 per cent. This is significantly more than the 23 per cent and 25 per cent reported by those who did not lose a parent or lost their father. In a similar vein, the proportion of children who cannot write at all, even with errors, is a high 26 per cent compared to around 10 per cent in the other groups. Even in terms of quantitative ability, derived from a mathematics achievement test formulated for the

children,[45] those who lost their mother performed significantly worse than those who did not lose a parent, scoring an average of 3.94 on a test where scores ranged from 0 to 9, compared to the 4.91 and 4.87 of the groups who did not lose parents or lost just their father.

The table also has information regarding subjective wellbeing and psychosocial outcomes. The survey asks several questions that try to evaluate a child's subjective wellbeing (SWB), defined as his or her evaluation of life their life as a whole as well as their expectations for the future. The measure of subjective wellbeing used in this paper is an adaptation of Cantril's 'ladder' (Cantril, 1965) that asks the child where she places herself on a ladder of 1 to 9 rungs with the lowest and highest rungs reflecting the worst and best possible outcomes in life. This is followed by a question that asks about where the child will place herself in 4 years time. The difference between these two is used to reflect a child's sense of optimism in this paper. The data does not show any significant differences in the current position on the ladder between groups. In terms of expected position, children who lost a father tended to place themselves on a lower rung than others. However, the gap between the measures (our estimate for the sense of optimism) is not significantly different between the groups, and is therefore not reported.

We also estimate a child's self esteem (a favourable opinion about one's self), and agency or self efficacy (the belief that one is capable of performing in a certain manner to attain certain goals). The paper follows closely Dercon and Krishnan (2009), in constructing these variables out of the survey questions. The ensuing discussion about variable construction is also adapted from this paper. *Young Lives* captures psychosocial competencies by recording respondents' degree of agreement or disagreement with a number of statements measured on a 4-point Likert scale that ranges from strong agreement to strong disagreement. All the statements were drawn from the educational psychology literature, but as noted by Dercon and Krishnan, were

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[44] If a child relocated to a new household, different area or even a different country, the study would still do its best to track the child for survey purposes as Young Lives follows the child, rather than the household. Thus even if orphans are relocated after parental death, they would not usually be lost for survey purposes as common in household surveys.

[5] See Cueto et al. (2009) for more details on the reading, writing and mathematics tests used in the survey as well as the cognitive tests and PPVT scores.

adapted and tested extensively during piloting for use with children from different cultures.

The questions capturing a child's self esteem, in line with other similar surveys, looked mainly at positive and negative dimensions of pride and shame based on an adapted version of the Rosenberg Self-Esteem Scale (Rosenberg, 1965): *"I feel proud to show my friends or other visitors where I live", "I am ashamed of my clothes", "I feel proud of the job done by the head of household", "I am often embarrassed because I do not have the right books, pencils or other equipment for school", "I am proud of my achievements at school", "I am embarrassed by/ashamed of the work I have to do", "I am ashamed of my shoes", "I am worried that I do not have the correct uniform"* and *"The job I do makes me feel proud".* The self-esteem measure used in this paper is the simple average of these different questions, based on the standardized value of each item. In terms self esteem, maternal orphans score significantly lower than non-orphans.

A child's sense of agency was attempted to be captured by a set of questions that looked at optimistic beliefs about being able to affect outcomes, or cope with a variety of stressors: *"If I try hard I can improve my situation in life", "I like to make plans for my future studies and work"* and *"If I study hard at school I will be rewarded by a better job in future".* Again an average score was created based on standardised valued for the replies for the individual questions. Dercon and Krishnan discuss the internal validity of these measures and their consistency[6]

Table 1b presents Round 1 characteristics for child, household and community variables that may have a significant impact on schooling and SWB in Round 2, grouped by whether both parents were alive in Rounds 1 and 2, the mother died between rounds, or the father died between rounds. At the child level, there are no differences

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[6] . It is important to note that the first and second rounds of the Young Lives survey conducted in 2002 and 2006 does not directly contain some of the measures discussed in very recent literature on psychology economics such as conscientious and the 'big five'. Recent debates and discussions in psychology economics can be found in Almlundet.al (in press), Roberts et.al (2011) and McCann et. al (2009).

between the groups in terms of gender, height for age, birth order, reading, writing or numeracy at round 1. In terms of household characteristics, household size is significantly smaller in households where parents die between rounds. This may possibly be because the prevalence of HIV/AIDS or other long-term illnesses among parents have a negative impact on family size preferences (see Baylies 2000 for an example from Zambia), or possibly because some of the to-be orphans are already living with a grandparent, as in the case of 21 per cent of our maternal orphans. Indeed, the characteristics of a child's caregiver at round 1 reveal that around 90 per cent of the children who are not orphaned or who will go onto lose the father are cared for by the mother, as opposed only 68 per cent of those who go onto lose the mother. However, 73 per cent of the latter group claim to see the mother daily, although the mother is not the main caregiver. Households where a parent will die are significantly different to other households also because their caregiver is more likely to be divorced, separated or widowed (the latter indicative that even before the death of the parent the child is looked after by the grandparent for instance) and single headed. Reflecting this, somewhat, there are significantly fewer children aged 0 to 7 and older members (possibly grandparents) in households where a parent dies compared to households where a parent does not die. Quite notably, there are few other obvious differences in terms of household characteristics such as wealth, religion or education of household head at round 1 between the groups[7]. Region of residence is one of the other few factors that are different with a father's death seems to occur less in rural households and less in Tigray.

2.2. Adolescence: Child outcomes at age 14-15 and baseline child and household characteristics at age 11-12

Table 2a reports child outcomes at round 3 between children who lost a parent in their adolescent years and those who did not. It shows that the 12 maternal orphans do not have significantly different outcomes to the group with both parents alive. However, the group whose father died have significantly lower school enrolment rates (80 per

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[7] Household wealth is proxied by a wealth index based on four housing quality indicators (number of rooms per person, wall, roof and floor durability), possession of 11 consumer durables (radio, fridge, bicycle, TV, motorbike/scooter, motor vehicle, mobile phone, landline phone, bed, table or chair and sofa) and four items reflecting access to services (electricity, water, sanitation, cooking fuel).

cent versus 90 percent for the control group), significantly lower maths scores (2.15 versus 4.18) and significantly lower sense of agency (a z-score of -0.27 compared with -0.01). Thus the descriptive statistics suggest that a father dying in adolescence may have significant negative impact on schooling and psychosocial outcomes. Unfortunately the round 3 questionnaire does not ask the children where on the ladder they think they will be in four years time. Thus we are not able to construct a measure of optimism as we did in the previous section, for the children who lost a parent in adolescence.

Table 2b looks at baseline characteristics. This is based on round 2 data, when both parents were alive for all three groups. The construction of the variables concerned are similar to that already discussed in the previous section. The 12 children who will go on to lose the mother in adolescence seem to have significantly lower investments in health (with a eight for age z-score of -2.01 standard deviations below the mean. A significantly lower proportion of this group are cared for by their mother (75% compared to 91% in the control group). However, 92% the children claim to see their mother daily. Even in the group where the father dies in adolescence, the mother is the caregiver for a significantly lower proportion of children (80%) than the control group. Apart from these baseline characteristics, there are just a few other characteristics that are significantly different between the three groups. These include household demographic composition (significantly fewer males aged 0 to 7 and significantly higher males over 60 in the group where the father will die between rounds, compared to the control group) and region of death (with significantly lower households where maternal death occurs coming from Tigray). This is broadly similar to what was discussed in the previous section.

3. Empirical strategy

As discussed in the introduction one of the biggest issues in attempting to estimate the impact of parental death on child outcomes is the fact that death may not be random[8]. There may be unobservables that are correlated with parental death that makes estimates biased. One approach to investigates this, following Beegle et.al (2006) and Case and Ardington(2006) is to regress pre-orphan hood outcomes on future orphan status. Since AIDS deaths are asymptomatic 2-3 years before death this might

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[8] Unfortunately the survey does not provide any information as to the cause of death.

be a valid test for unobservables. The significance of future orphan hood indicates the presence of unobservables correlated with parental death that cannot be controlled for or indicates that the effects of parental death influenced child outcomes before the parent died. Our estimations (unreported) show that future orphan status did not have a statistically significant impact on school enrolment, reading or writing ability in round1, even when controlled for individual, household, caregiver and community characteristics. We have not been able to make similar estimations for the SWB or psychosocial variables as these questions were not asked in round 1. They are available, however, for round 2, so it was possible to look at looked at the impact of future orphan status in adolescence on SWB, psychosocial variables as well as enrolment, cognitive scores (ppvt scores) and maths scores in round 2. Again, these results have not been reported, but do not indicate that future orphan status is significant.

The analysis of the impact of parental death in middle childhood uses probit or ordinary least squares (OLS) estimation with round 2 outcomes explained by round 1 characteristics (baseline, pre-orphan hood variables). The analysis if the impact of parental death in adolescence uses probit or OLS estimation of round 3 outcomes explained by round 2 characteristics. Thus the equation estimated to look at the impact of a mother's death on child outcomes in middle childhood would be:

$$y_{ij} = \alpha + \beta_1 O_j + \beta_2 X_{ij} + \varepsilon$$

Where *y* is the round 2 outcome variable of interest (school enrolment,, reading, writing ability, mathematical score, sense of optimism about the future, , self esteem, agency) for child *i* in household *j*, O is a vector indicating the orphan status of the child (i.e., mother died between rounds or father died between rounds), and *X* is a vector of control variables including individual characteristics such as the gender, accumulated investments in child health (proxied by the height for age z-score), birth order of child, household wealth, log of household size, the demographic composition of the household (males and females separately in age groups 0-7, 25 to 59 and over 60 as a proportion of household size, with females over 60 omitted). Also included are caregivers' education (in years), religion (Muslim, protestant with orthodox Christian omitted) and ethnicity of the mother (Amhara, Oromo, Tigray with other ethnic groups omitted). Since caring arrangements were noted to be significantly different between

households where a parent died or did not die, we have included some of these in the specification. Thus, we control for whether the child sees the mother daily, the father daily and whether the mother was the main caregiver in round 1. We also include a dummy variable indicating whether the caregiver was married (as opposed being divorced, widowed, single or separated). In order to control for community level characteristics, we also include 23 community dummies

4. Results

4.1. Death of a parent in Middle Childhood

Table 3 presents results for the analysis of a parent dying between rounds 1 and 2. The table shows that a mother's death affects school enrolment negatively with these orphans 33 per cent less likely to be enrolled at school than non-orphans.. Other significant positive influences on school enrolment are household wealth and the accumulated investments in child health (proxied by the height for age z-score). No significant effects on schooling outcomes are observed when a father dies.

Parental death does not have a statistically significant effect on a child's reading, writing and mathematics scores, once controlled for number of years completed at school and recorded scores in these areas in round 1. Significant influences on a child's reading at round 2 are household wealth, the proportion of females in the 25-59 age group compared to females over 60 and the child's current grade at school. The variables that influence a child's inability to write, even with difficulty and errors are different to those that influence reading. Inability to write at round 2 are significantly positively influenced by inability to write at round 1, indicating that child specific fixed effects may be an issue and rural residence. It is negatively influenced by children whose ethnicity is Tigray, current grade at school and having daily contact with the father at round 1.   The mathematics score in round 2 is affected significantly and positively is the child is a boy, by height for age, birth order (the younger is the child the better is performance), ethnicity being Amharic, the care giver being married at round 1 as opposed to being widowed, divorced or unmarried and education level of the caregiver.

The death of the father or mother has a significant negative impact on a child's sense of optimism about the future, by 0.68 and 0.55 points respectively on a scale of 1 to 9.

Interestingly, in the case of a father's death a child's sense of agency is also affected significantly, albeit positively with the impact being small with a coefficient of 0.1 standard deviations. Thus while a father's death may play a particularly negative impact on a child's sense of optimism, it is also likely that children are more involved in household decision making and contribute to household resources which increases their sense of agency. Self esteem is not significantly affected by parental death between rounds

However these short-term effects of parental death in middle childhood do not seem to persist in the medium term. As Table 4 shows, when outcomes in round 3, when children in these groups are 14-15 years are compared, we notice that differences in schooling and psychosocial outcomes no longer exist[9]. However, how orphans and non-orphans use their time is significantly different in some cases. For example, children who lost the father in middle childhood engage more in paid employment and self employment. (Table 5). Boys also tend to spend significantly more time doing domestic chores than non-orphaned boys especially if the mother dies.

One of the reasons that maternal orphans seem to suffer more in terms of school enrolment in the short-run maybe because many of them experience a change in their caregiver. Five out of nineteen children who lost their mother in middle childhood in our sample is cared for by someone who is not an immediate relative, such as a father, grandparent or sibling (even step or half sibling), uncle or aunt but a cousin or someone who is not a relative. Fortunately however, this disruption caused to caregiver arrangements does not seem to affect the outcomes considered for the children in our sample at round 3.

4.2. Death of a parent in adolescence

Table 6 shows regression results for the impact of parental death in adolescence. Confirming the suggestions in the descriptive statistics, the death of a mother does not seem to have any impact on the considered schooling or psychosocial outcomes. However, a mother's death seems to have a significant negative impact on the adolescent's subjective wellbeing measured by current assessment of life on a score of

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[9] Note that we had 19 children who lost the mother between round 1 and 2. However, we only include 16 children in the current analysis as i child was lost to attrition and 2 children went on to lose their father between round 2 and 3. Of the 57 children who lost the father, only 57 are included in the current analysis as we lost 1 child to attrition.

1 to 9[10]. However, the death of the father has a significantly negative impact on school enrolment and maths scores and a child's sense of agency. A father's death in adolescence reduces the chance of being enrolled at school by 23 per cent, maths scores by 2.02 points and the sense of agency by 0.3 standard deviations compared non-orphans. Other variables affecting the test scores significantly are gender (the child being male has a significant positive effect), grade completed, baseline test scores and household wealth. A strong influence on the psychosocial and SWB outcomes is household wealth.

The reason as to why adolescents who lose their father perform so poorly in cognitive and maths tests and have Lowe school enrolment is not clear. Time use data for this group does not indicate that they engage in employment any more than the control group in a statistically significant sense (Table 7). Boys tend to spend more time on domestic tasks than the control group (non-orphaned boys) if their mother died. But they also spend less time doing unpaid work so the difference seems to even out. Some studies argue that the change in a caregiver following the death of the parent has a significant impact on outcomes. But in the case of the sample we use, 90% of the paternal orphans (and 92 % of the maternal orphans) continue to have a biological parent as their main caregiver. The houses these orphans live in area of a similar wealth status as that of the control group. Thus the poor educational outcomes cannot be explained by actual changes to caregiver arrangements. It is likely therefore that the educational outcomes due to paternal death in adolescence works through how it affects a child's sense of self efficacy or agency. It is unclear at this point whether these effects will persist in the longer term.

Robustness Checks

The results in sections 4.1. and 4.2 were tested for robustness using alternative specifications. First, I include information regarding community-level characteristics (number of education programmes, number of health programmes and whether prostitution was an issue in the community), along with the other variables to the original specification, apart from the community dummies and re-estimated the results (unreported). Second, I made the specification much more parsimonious by excluding

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[10] This is supported by the fact the significantly more maternal orphans (41 %) whose mother died in adolescence respond 'most of the time' to the question "Are you are often unhappy, | downhearted or tearful?" , compared to 15% of the children in the control group.

all community dummies and re-estimating. The results remain robust to change in specifications: For children in middle childhood a mother's death has a significant negative impact on school enrolment and sense of optimism. A father's death has a significant negative impact on a child's sense of optimism and a positive impact on the sense of agency. For adolescent children the death of the father has significant negative impacts on school enrolment, maths scores and the sense of agency.

5. Conclusions

This paper shows that children who lose a mother in middle childhood (between ages 7–12) are about 33 per cent less likely to attend school than children who do not experience the death of the mother. The death of a father does not have an impact on school enrolment. Once controlled for years of schooling, neither the death of the father or mother has an impact on reading or writing ability or mathematical scores. The paper also looked, uniquely, at the impact parental death has on a child's subjective wellbeing and psychosocial outcomes. It was seen that the death of the mother or father has a significant negative impact on a child's sense of optimism about the future. A father's death seems to have a positive influence on a child's sense of agency or self efficacy. Parental death did not have a significant impact on other psychosocial outcomes such as sense of being treated with respect and self esteem, as measured in the paper. Although these results are robust against various specifications, they do not persist in the longer term. By the time these children reach ages 14-15, the observed differences in schooling and psychosocial outcomes between orphans and non-orphans cease to exist. It is quite notable, however, that significantly more children who lost their father engage in paid employment and spend more hours a day on paid employment than non-orphans. Children who lost the mother in middle childhood tend to spend more hours on domestic chores than non orphans. It is also notable that caregiver arrangements for maternal orphans change significantly from what is was before the mother dies. Around 26 per cent of the children who lost a mother in middle childhood are cared for by a distant relative or non-relative (compared to 5 per cent of non orphans). This may be one of the reasons why school enrolment is significantly low among children who lose their mother in middle childhood.

In adolescent years between ages 12 to 15 it is the loss of the father that seems to have a significantly negative impact on school enrolment and test scores in our data. They also have a significantly lower sense of self efficacy or agency. Maternal

orphans, on the contrary indicate high enrolment and achievement rates, in our small sample of 12 maternal orphans. Time use data does not indicate any significant differences between those children that lost a parent in adolescence and others, apart from the fact that orphans spend significantly more hours on domestic tasks than non-orphans if the mother died. The caregiver arrangements between orphans and non-orphans are not significantly different when a parent dies during a child's adolescence: over 90 percent of the children continue to be cared for by a close relative. Even in terms of key household characteristics such as wealth, there is no significant difference between households with orphans and those without. It is possible, therefore, that the low enrolment and educational outcomes for paternal orphans comes through the low sense of agency the death seems to cause. Overall, however, it should be remembered that these results cannot be generalised as it pertains to a small sample of maternal and paternal orphans.

It will be interesting to see whether these outcomes persist when further rounds of Young Lives data become available right up to 2015 when the children will be around 22 years of age. Future rounds of data will also enable us to see if parental death if the negative impact of a father's death during adolescence in particular puts children at a higher risk of poverty in adulthood and whether it has a lasting impact on human capital development.

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Table 1a. Summary statistics: outcomes in Round 2 (children aged 11-12 years)

	Both parents alive at R2[1]	Mother died between R1 and R2 (but both parents alive at R1)[2]	Father died between R1 and R2 (but both parents alive at R1)[2]
Child schooling outcomes			
Enrolled at school R2	0.95	**0.78***	0.92
Missed school for at least a week over past year	0.13	**0.33**	0.13
Years of completed education (if enrolled)	4.04	3.63	4.05
Years of completed education (if dropped out between R1 and R2)	2.23	1.5	4
Level read 1=nothing 2=letters 3=words 4=sentences	3.28	2.89	3.25
Proportion who cannot read anything or read only letters (not words or sentences)	0.23	**0.42***	0.25
Cannot write	0.10	**0.26**	0.09
Mathematics score (range 0-9)	4.91	**3.94**	4.87
Child subjective well-being			
Current position on ladder range: 1 to 9	4.35	4.13	4.04
Expected position 4 years from now	6.22	5.57	**5.55**
Agency	0.32	0.19	0.40
Self esteem	0.04	**-0.19***	-0.08
Number (Total)	782	19	57
Boys	51	11	28
Girls	48	8	29

* significant at the 10 per cent level ** significant at the 5 per cent level *** significant at the 1 per cent level

Source: Own calculations based on Young Lives Ethiopia Older Cohort data for Round 2 (2006).

Table 1b. Summary statistics: conditioning variables (Round 1)

	Both parents alive at R2[1]	Mother died between R1 and R2 (but both parents alive at R1)[2]		Father died between R1 and R2 (but both parents alive at R1)[2]	
Child characteristics					
Sex (1=male)	0.51	0.58		0.49	
Height-for-age z-score	-1.43	-1.33		-1.30	
Birth order	3.00	2.77		3.01	
Proportion who cannot read anything or read only letters (not words or sentences)	0.73	0.73		0.82	
Cannot write at all even with difficulty and errors (Round 1)	0.58	0.70		0.50	
Numeracy (proportion that answered correctly how much 2 x 4 is)	0.42	0.30		0.45	
Caregiver characteristics					
The main caregiver is the mother	0.92	**0.68***		0.89	
The child sees the mother daily	0.93	**0.73***		0.89	
Care giver is currently married	0.87	**0.63***		**0.63***	
The caregiver is the head of the household	0.09	**0.30****		**0.25****	
Household characteristics					
Wealth	0.21	0.27		0.24	
Household size	6.7	**5.31****		**5.75****	
Males aged 0 to 7 as a proportion of household size	0.12	0.07		**0.06****	
Females aged 0 to 7 as a proportion of household size	0.11	**0.01****		0.12	
Males aged 25 to 59 as a proportion of household size	0.16	0.15		**0.10****	
Females aged 25 to 59 as a proportion of household size	0.20	**0.30****		**0.27****	
Males over 60 as a proportion of household size	0.01	**0.07****		0.01	
Rural residence	0.68	0.63		**0.52***	
Regional dummies:					
Addis Ababa	0.13	0.21		0.14	
Amhara	0.19	0.26		0.24	
Oromo	0.19	0.21		0.22	
Tigray	0.21	0.15		**0.10***	
SNNPR	0.26	0.15		0.28	
Number (Total)	782	19		57	
Boys	51	11		28	
Girls	48	8		29	

Note: There were no significant differences between the groups in terms of religion (proportion of Muslims, Protestant, Orthodox Christians and other) or in terms of schooling of household head. These summary statistics have therefore not been reported.

* significant at the 10 per cent level ** significant at the 5 per cent level

Source: Own calculations based on Young Lives Ethiopia Older Cohort data for Round 1 (2002).

Table 2a. Summary statistics: outcomes in Round 3 (children aged 14-15 years)

	Both parents alive at R3[1]	Mother died between R2 and R3 (but both parents alive at R2)[2]	Father died between R2 and R3 (but both parents alive at R2)[2]
Child schooling outcomes			
Enrolled at school R2	0.90	1	0.80*
Missed school for at least a week over past year (if enrolled)	0.13	0.25	0.12
Years of completed schooling (if enrolled)	5.75	4.91	5.06
		-	
Cognitive score (PPVT standard score)	98.1	106.4	90.9
Maths score	4.18	4.08	2.15**
Years of completed schooling (if dropped out)	3.17	**-**	3
Child subjective well-being			
Current position on ladder range: 1 to 9	4.91	3.83	4.55
Agency	-0.01	-0.11	-0.27**
Self esteem	-0.01	0.11	-0.075
Number (Total)	748	12	20
Boys	362	6	6
Girls	386	6	14

* significant at the 10 per cent level ** significant at the 5 per cent level *** significant at the 1 per cent level

Source: Own calculations based on Young Lives Ethiopia Older Cohort data for Round 2 (2006).

Table 2b. Summary statistics: conditioning variables (Round 2)

	Both parents alive at R3[1]	Mother died between R2 and R3 (but both parents alive at R2)[2]	Father died between R2 and R3 (but both parents alive at R2)[2]
Child characteristics			
Sex (1=male)	0.52	0.5	0.7
Height-for-age z-score	-1.39	-2.01*	-1.55
Birth order	2.94	2.33	3.6
Cognitive score (PPVT)	125.05	130.2	121.0
Maths score	4.93	4.45	4.41
Caregiver characteristics			
The main caregiver is the mother	0.91	**0.75***	0.8*
The child sees the mother daily	0.94	**0.92***	0.85
The caregiver is the head of the household	0.16	**0.33****	**0.15**
Household characteristics			
Wealth	0.33	0.37	0.34
Household size	6.47	**6.0**	**6.75**
Males aged 0 to 7 as a proportion of household size	0.09	0.08	**0.04***
Females aged 0 to 7 as a proportion of household size	0.09	0.09	0.05
Males aged 25 to 59 as a proportion of household size	0.15	0.19	**0.13**
Females aged 25 to 59 as a proportion of household size	0.19	0.26	**0.17**
Males over 60 as a proportion of household size	0.02	0.01	0.08**
Females over 60 as a proportion of household size	0.01	0.02	0.04
Proportion of Orthodox Christians and other religions	0.68	1**	0.7
Rural residence	0.64	0.5	**0.6**
Regional dummies:			
Addis Ababa	0.13	0.16	0.2
Amhara	0.19	0.16	0.25
Oromo	0.20	0.20**	0.15
Tigray	0.21	0.08*	0.15
SNNPR	0.26	0.08	0.25
Number (Total)	748	12	20
Boys	362	6	6
Girls	386	6	14

Note: There was no significant difference between the groups in terms of the proportion of Muslims or Protestants nor in terms of the education level of the head. Summary statistics for these characteristics have therefore not been reported.

* significant at the 10 per cent level ** significant at the 5 per cent level

Source: Own calculations based on Young Lives Ethiopia Older Cohort data for Round 1 (2002).

Table 3: Impact of parent dying in middle childhood (between rounds 1 and 2 on round 2 outcomes)

.	(1) enrolled in round 2	(3) cannot read at round 2	(4) cannot write at round 2	(5) maths score	(6) sense of optimism about the future	(8) Agency	(9) Self esteem
Mother died between rounds	-0.331*** [0.174]	0.197 [0.157]	0.006 [0.030]	-0.117 [0.484]	-0.689* [0.344]	-0.099 [0.107]	-0.027 [0.182]
Father died between rounds	-0.008 [0.019]	0.040 [0.074]	-0.007 [0.006]	0.196 [0.294]	-0.552** [0.218]	0.151* [0.073]	-0.045 [0.074]
Gender (=1 if male)	-0.004 [0.007]	0.002 [0.033]	0.005 [0.005]	0.271** [0.137]	-0.232 [0.160]	-0.049 [0.034]	-0.076 [0.055]
Height for age z-score	0.012*** [0.004]	-0.008 [0.014]	0.000 [0.002]	-0.113* [0.060]	0.098 [0.057]	0.020 [0.022]	0.002 [0.018]
Current grade at school (round 2)		-0.09*** [0.014]	-0.018*** [0.007]	0.864*** [0.055]			
Cannot read at round 1		0.081 [0.051]					
Cannot write at round 1			0.015** [0.009]				
Ethnicity- Amhara	-0.006 [0.032]	-0.046 [0.089]	-0.018 [0.014]	0.786** [0.338]	-0.300 [0.228]	-0.000 [0.081]	0.196* [0.104]
Ethnicity- Oromia	-0.026 [0.050]	-0.017 [0.078]	-0.009 [0.009]	0.311 [0.323]	0.238 [0.248]	0.056 [0.062]	0.036 [0.082]
Ethnicity- Tigray	-0.007 [0.190]	-0.178 [0.139]	-0.108*** [0.064]	0.019 [0.596]	-0.503 [0.475]	-0.179 [0.177]	0.336* [0.176]
Sees father daily	0.002 [0.014]	0.032 [0.057]	-0.034** [0.025]	0.073 [0.239]	-0.002 [0.192]	0.030 [0.057]	-0.089 [0.068]
Sees mother daily	0.024 [0.031]	-0.035 [0.077]	0.001 [0.010]	-0.727** [0.295]	-0.124 [0.256]	-0.086 [0.108]	0.052 [0.079]

Wealth	0.112**	-0.295*	-0.004	0.238	-1.008	0.286	0.449*
	[0.045]	[0.171]	[0.028]	[0.684]	[0.612]	[0.199]	[0.236]
caregiver education	0.001	0.002	0.000	0.059**	0.023	0.003	0.015**
	[0.002]	[0.007]	[0.001]	[0.027]	[0.024]	[0.010]	[0.006]
Household size	-0.030	0.067	-0.020	-0.375	0.242	-0.016	0.163**
	[0.022]	[0.091]	[0.014]	[0.339]	[0.247]	[0.134]	[0.076]
Rural	-0.130	0.121	0.321***	0.042	-0.165	0.162	-0.139
	[0.147]	[0.180]	[0.104]	[0.579]	[0.352]	[0.148]	[0.129]
Caregiver is	0.016	0.055	0.016**	0.571*	-0.713***	0.084	0.076
married	[0.031]	[0.070]	[0.007]	[0.310]	[0.254]	[0.128]	[0.083]
Observations	646	729	619	778	782	804	805

Notes: Coefficients are marginal effects. All conditioning variables are values for round 1, apart from the dummy variables indicating whether mother or father died between rounds and the current grade at school. Variables birth order, demographic composition (males 0 to 7, females 0 to 7, males 25 to 59, females 25 to 59, males over 60 and females over 60 all as a proportion of household size),, 23 community dummies, religion of child (Muslim, protestant with other groups omitted) included in main regression but not reported. Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 4: Persistence of results: Outcomes in Round 3 for those children that lost a parent in middle childhood

	Both parents alive at R3[1]	Mother died between R1 and R2 (but parents both alive at R1)[2]	Father died between R1 and R2 (but parents both alive at R1)[2]
Child schooling outcomes			
Enrolled at school R2	0.90	0.87	0.86
Missed school for at least a week over past year	0.13	0.14	0.11
Years of completed education (if enrolled)	5.75	5.14	5.7
Cognitive score (PPVT standard score)	123.5	116	123
Maths score	4.18	4.75	3.8
Child subjective well-being			
Current position on ladder range: 1 to 9	4.91	5.0	3.9**
Agency	0.01	0.10	-0.06
Self esteem	-0.01	-0.10	-0.08
Number (Total)	748	16	56
Boys	362	9	28
Girls	386	7	28

* Significant at the 10 per cent level ** significant at the 5 per cent level *** significant at the 1 per cent level

Note: Sample of maternal orphans not the same as in Tables 1 and 2 with 3 children have been excluded: One due to attrition, and 2 due to the fact that the father died as well, between round 2 and 3. Sample of paternal orphans is one less than that in Table 1 and 2 due to attrition.

Source: Own calculations based on Young Lives Ethiopia Older Cohort data for Round 2 (2006).

Table 5: Daily Time Use in Round 3: Children with both parents alive compared with children whose parents died in middle childhood

	Boys			Girls		
	Both parents alive at round 3	Mother died between round 1 and 2	Father died between round 1 and 2	Both parents alive at round 3	Mother died between round 1 and 2	father died between round 1 and 2
Paid employment (%)	4	0	20**	2	0	10**
Self employment %	49	36	45	5	0	14**
Hours spent on paid work	0.4	0.3	1.6**	0.02	0	0.1**
Hours spent on unpaid work	2.3	2.3	1.9	0.45	0.12	0.31
Hours spent studying or receiving private tutoring	2.13	1.3	1.6	1.9	1.25	1.7
Hours spent on domestic tasks	1.76	2.6*	1.6	3.48	4.25	3.24

Notes: ** significant at 5 per cent level and * significant at 10 per cent level compared to both parents alive. Boys and girls are considered separately.

Source: Own calculations based on Young Lives Ethiopia Older Cohort data for round 3

Table 6: Impact of parent dying in adolescence (between rounds 2 and 3 on round 3 outcomes)

	(1)	(2)	(3)	(4)	(5)	(6)
	Enrolled in round 3	PPVT score Round 3	Maths score Round 3	Subjective wellbeing index round 3	Agency	Self esteem
Mother died between round 2 and 3		4.878	0.809	-0.702*	-0.135	0.0353
		(1.375)	(0.896)	(1.64)	(1.129)	(0.154)
Father died between round 2 and 3	-0.232**	-7.496	-2.022**	-0.506	-0.295*	0.0928
	(-2.496)	(-1.222)	(-2.309)	(-1.170)	(-1.645)	(-.586)
Gender (=1 if male)	-0.0129	5.207***	0.764***	-0.128	0.00613	0.0446
	(-0.730)	(3.601)	(3.107)	(-1.090)	(0.160)	(0.937)
Height for age z-score	-0.0124	-0.586	0.0505	-0.0720	-0.039**	-0.0189
	(-1.494)	(-0.948)	(0.417)	(-1.248)	(-2.232)	(-0.896)
ppvt score	0.0004	0.128***	0.0146**	-0.0003	0.0000	0.0007
	(0.102)	(3.318)	(2.473)	(-0.0997)	(0.0586)	(0.616)
maths score	0.0116***	1.053***	0.553***	-0.00330	-0.00568	-0.00384
	(2.790)	(2.685)	(8.457)	(-0.105)	(-0.572)	(-0.281)
grade completed	0.0143	3.593***	0.338***	-0.0153	0.0273	0.0382*
	(1.633)	(5.811)	(2.894)	(-0.274)	(1.454)	(1.881)
Rural residence	-0.530***	2.516	-1.826	0.401	-0.84***	-0.82***
	(-5.166)	(0.205)	(-1.190)	(0.585)	(-3.617)	(-3.857)
Ethnicity-Amhara	-0.988***	1.375	4.875**	-1.860	0.553	0.714**
	(-4.466)	(0.119)	(2.292)	(-1.622)	(1.469)	(1.965)
Ethnicity Oromia	-1.000***	1.312	0.0443	-2.645***	-0.435	-0.412*
	(-9.927)	(0.0817)	(0.0228)	(-3.864)	(-1.450)	(-1.853)
Ethnicity Tigray	0.0519	11.58	2.237*	-2.200*	0.378	0.435
	(0.376)	(1.026)	(1.685)	(-1.923)	(1.157)	(1.450)
Wealth	0.152**	19.35***	3.636***	3.971***	0.378***	0.644***
	(2.126)	(3.396)	(3.375)	(7.782)	(2.584)	(2.889)
Constant		75.60***	-2.677	1.634**	-0.568**	-0.429
		(7.610)	(-1.483)	(1.975)	(-2.075)	(-1.308)
Observations	558	730	729	730	730	730
R-squared			0.411	0.203	0.203	0.263

Notes: Coefficients are marginal effects for the probit regression in column (1). All conditioning variables are for values in round 2, apart from the dummies indicating whether mother or father died between rounds 2 and 3. Variables birth order, household size, demographic composition (males 0_7, females 0_7, males 25_59, females 25_59, males over 60 all as a proportion of household size), current grade at school, 23 community dummies, religion of child (Muslim, Protestant with other groups omitted), a dummy indicating whether main caregiver is mother and dummies indicating whether the child sees the mother daily and father daily are included in all the regressions but not reported. Robust z-statistics in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 7: Daily Time Use in Round 3: Children with both parents alive compared with children whose parents died in adolescence

	Boys			Girls		
	Both parents alive at round 3	Mother died between round 2 and 3	Father died between round 2 and 3	Both parents alive at round 3	Mother died between round 2 and 3	father died between round 2 and 3
Paid employment (%)	4	16	0	2	0	0
Self employment %	49	50	43	6	0	0
Hours spent on paid work	0.41	1	0.14	0.48	0.33	0
Hours spent on unpaid work	2.25	1.7	3.1	0.45	0	0.83
Hours spent studying or receiving extra tuition	2.15	1.5	1.7	1.9	1.3	2.8
Hours spent Supervising young children while doing other activities	2.64	0.5	0.4	1.19	0.5	0.5
Hours spent on domestic tasks	1.75	2.66**	2	3.4	4.3	2.83

Notes: ** significant at 5 per cent level and * significant at 10 per cent level compared to both parents alive. Boys and girls are considered separately.